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The Success Factors of Business Incubators to Promote Entrepreneurial Practices in the UAE

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This dissertation is submitted in partial fulfilment of the requirements for the degree of Doctorate of Business Administration

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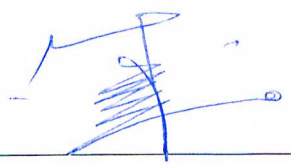
Declaration of Original Work

I, Fareed Mahmoud Abdallah Al Ameeri, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this dissertation, entitled "*The Success Factors of Business Incubators to Promote Entrepreneurship Practices in the UAE*"; hereby, solemnly declare that this dissertation is the original research work that has been done and prepared by me under the supervision of Dr Maqsood Ahmad Sandhu, in the College of Business and Economics at the UAEU. This work has not previously been presented or published or formed the basis for the award of an academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources (whether published or unpublished) and relied upon or included in my dissertation have been properly cited and acknowledged in accordance with appropriate academic conventions. I further declare that there is no potential conflict of interest with respect to the research, data collection, authorship, presentation and/or publication of this dissertation.

Student's Signature:  Date: 27/5/2019

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Abstract

Business incubators have shown as a practical approach for enhancing entrepreneurial success in several countries. In the UAE, the National Innovation Strategy has determined business incubation as one of the enablers for nurturing entrepreneurs and support their ventures. However, due to the novelty of incubators in the country, few incubators have been established and sustained. This study aims to determine the factors that may affect the success of incubators and examine their expected roles at the micro and macro level in the UAE. Due to the limited relevant population, this research adopted a mix-methodology combining thematic analysis for the interview method as well as descriptive, correlation, and regression analysis for the survey questionnaire. The study targeted five categories of incubators' stakeholders in the UAE and supported by 14 research hypotheses. The results showed that incubators would be successful when they could graduate entrepreneurs establish, and sustain start-ups in the market, while the success factors of incubators were found to be related to four internal (e.g., commercialisation activities) and four external (such as government support) factors. Also, nurturing entrepreneurs, creating jobs, and contributing to the local economy were the main expected roles of incubators in the UAE. The research proposed a conceptual framework of incubations' success, which enables the government to address the challenges faced by incubated entrepreneurs as well as help different type of incubators to operate across the economic sectors in the country. The study recommends having a conducive bylaw that supports incubators and allocates incentives for their incubated entrepreneurs in order to attract more entrepreneurs to the country. Besides that, the study recommends building systemized collaboration between the stakeholders of incubators through which it promotes entrepreneurial practices in the UAE. Moreover, the study suggests developing helpful guidelines to govern the entry/exit criteria, funding mechanism, and programmes at the incubators. Finally, the study suggests conducting individual studies for identifying each success factor, as well as case studies on university-based incubators in the UAE.

Keywords: Entrepreneurship, Business Incubation, Success Factors, UAE.

Title and Abstract (in Arabic)

عوامل نجاح حاضنات الأعمال لتطوير ممارسات ريادة الأعمال في دولة الإمارات

الملخص

تعتبر حاضنات الأعمال إحدى الوسائل التي أثبتت فاعليتها في دعم ريادة الأعمال في العديد من الدول. وأكدت الاستراتيجية الوطنية للابتكار في دولة الإمارات العربية المتحدة على أهمية مبادرة حاضنات الأعمال كونها أحد الممكنات التي تخدم رواد الأعمال وتدعم شركاتهم الناشئة. ونظراً لحداثة حاضنات الأعمال بالدولة فقد تم إنشاء واستدامة عدد قليل من الحاضنات بالدولة. إن الهدف من هذه الدراسة هو تحديد العوامل التي تسهم في نجاح حاضنات الأعمال وتحديد الأدوار المنوطة بها على المستوى الاستراتيجي والفردي. ونظراً لمحدودية الجمهور المستهدف، تبنت هذه الدراسة منهجية استخدمت فيها أدوات متعددة للحصول على المعلومات جمعت ما بين التحليل الموضوعي لعدد من المقابلات، والتحليل الوصفي والارتباطي والاستدلالي للاستبيانات، واستهدفت خمس فئات من شركاء العمل للحاضنات، علاوة على اعتمادها على 14 فرضية بحثية. أظهرت النتائج أن معايير نجاح الحاضنات تكمن في قدرتها على تخريج روّاد الأعمال، وتأسيس مشاريع ناشئة لديها القدرة على النمو والاستدامة، بالإضافة إلى ضرورة تأمين مجموعة من العوامل الداخلية (مثل برامج التسويق التجاري) والخارجية (مثل الدعم الحكومي)، كما أكدت على ضرورة تركيز الحاضنات على رعاية رواد الأعمال وخلق فرص العمل، والمساهمة في الاقتصاد المحلي للدولة.
أسفرت نتائج البحث عن وضع إطار عمل لنجاح حاضنات الأعمال في الدولة، والذي من المتوقع أن يدعم الخطط الحكومية للتغلب على التحديات التي يوجهها رواد الأعمال في الحاضنات، بالإضافة إلى تمهيد إنشاء أنواع مختلفة من الحاضنات في القطاعات الاقتصادية بالدولة. توصي الدراسة بوضع سياسة ملائمة تدعم مختلف حاضنات الأعمال، وتقترح عدداً من الحوافز التي تهدف إلى استقطاب المزيد من رواد الأعمال إلى الدولة، بالإضافة إلى إرساء قواعد منظمة للتعاون بين شركاء العمل في مجال ممارسات ريادة الأعمال والحاضنات في الدولة، كما دعت الدراسة إلى ضرورة وضع مبادئ وإرشادات توجيهية داعمة تنظم شروط التسجيل والانضمام إلى الحاضنات والتخرج منها، وآليات التمويل والبرامج المعتمدة في الحاضنات. كما اقترحت الدراسة إجراء دراسات مستقلة لتحديد كل عامل من عوامل نجاح حاضنات الأعمال وإجراء دراسة حالات الحاضنات المرتبطة بالجامعات في الدولة.

مفاهيم البحث الرئيسية: ريادة الأعمال، حاضنات الأعمال، عوامل النجاح، دولة الإمارات العربية المتحدة

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Dedication

To my beloved country which enabled me to reach where I am now,
To all my dear friends and colleagues who shared with me the DBA journey, offered their support, and encouraged me to pursue my DBA study,
To my mother, for her endless care and pray,
To my father, whom I miss sharing this moment, for teaching me that true learning is about practising,
To my kids; Mariam, Hamad, Badr, Manal, and the coming baby for their understating and patience and for being away from them, their smiles were always energy to stay positive,
Moreover, last, to my life aspiration, my wife; Ruqeya for her sacrifices, dedication, love, and putting a true meaning in every step I moved in my career

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List of Abbreviations

APA	American Psychological Association
APS	Adult Population Survey
CERT	Centre of Excellence for Applied Research and Training
CEO	Chief Executive Officer
DIC-1	Dubai Internet City
DIC-2	Dubai Industrial City
DMC	Dubai Media City
DSO	Dubai Silicon Oasis
DuBiotech	Dubai Biotechnology & Research Park
GCC	Gulf Cooperation Council
GCR	Global Competitiveness Report
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
GII	Global Innovation Index
IASP	International Association of Science Parks
IASTP	Italian Association of Science and Technology Parks
ICT	Information and Communication Technology
KACST	King Abdulaziz City for Science and Technology
KV	Knowledge Village
MENA	Middle East and North Africa region
MLR	Multiple Linear Regression
MR	Multiple Regression
NBIA	The National Business Incubation Association
PCA	Factor Analysis, Factor Components Analysis
SPSS	Statistical Package for Social Science
SMEs	Small and Medium Enterprises
Techno Park	Technology Park
VIF	Variable Inflation Factor

Chapter 1: Introduction

1.1 Overview

A space that incubates individuals to accelerate their entrepreneurial ventures and supported by value-added services under an enabling environment has progressively emerged worldwide since the 1970s. Irrespective of its sponsors or objectives, this structured space is called a business incubator. Studies revealed that the incubation concept has shown as a practical approach to entrepreneurial success and economic growth in many developed countries (Sithole & Rugimbana, 2014 and Blackburne, 2014). According to Burnett (2009) and Lish (2012), many researchers in the field indicated that incubators are expected to nurture successful entrepreneurs at a micro level and support the socio-economic plans at a macro level when they are having the right services and enabling factors.

As such, the developed countries have adopted the incubation initiative as one of the innovative approaches for introducing value-added products and services in the market. As a result, this strategy has helped their governments to create jobs away from corporate employment. Moreover, Small and Medium Enterprises (SMEs) in general and entrepreneurship in particular in different parts of the world have been considered as an effective enabler for socio-economic development (Lish, 2012 and Hansen, Nohria, & Berger, 2000). However, their success, particularly at their early stage has always been a challenge, which has been accommodated by business incubators (Mian, 1996).

As far as the socio-economic development perspective of the Gulf Cooperation Council (GCC) Countries is concerned, the promotion of business sectors have always

been a priority in their national strategic plan. Consequently, initiatives that may support creating jobs and supporting SMEs have always been considered by respective authorities. With regards to the entrepreneurship aspect, countries, like the UAE, have come up with a bundle of initiatives that promote entrepreneurship practices. According to Byat & Sultan (2014), entrepreneurship is a critical element for the innovation ecosystem in the UAE. Therefore, the UAE Government had considered supporting the young generation for practising entrepreneurship when entering the job market.

Entrepreneurship culture, however, is not fully embedded within the education system yet; neither there is common practice in investing at local entrepreneurial ventures that may improve their products and services (Elmansori, 2014; Allam & Alfaki, 2013). Also, several studies within GCC region have shown that majority of corporations in the economic sectors do not depend on entrepreneurial ideas as a source of innovative products and services (Allam & Alfaki, 2013; Al-Mubaraki & Schröl, 2011). As a result, scholars in the GCC country advocated for appropriate business incubation initiatives, which enables entrepreneurs to develop their business ventures, nurturing their skills, and in the same time supporting some aspects of the national socio-economic plans (Al-Ansari, Pervan, & Xu, 2013; Byat & Sultan, 2014).

This Chapter is organised as follows. Following the introductory overview, Section 1.2 provides a general background of the UAE. Section 1.3 discusses the research problem. Section 1.4 justifies conducting the selected research topic. Section 1.5 discusses the research aim, research objectives, and research questions. Section 1.6 highlights the nature of the research study. Finally, Section 1.7 outlines the organisation of the dissertation body.

1.2 The Background of the UAE

Since its Federation on 2nd of December 1971, the UAE is considered as one of the fastest growing economies in the region by reaching US$375 billion in GDP in 2016 to rank its income-per-capita at the top (World Bank Report, 2016). The UAE has developed a modern infrastructure, welfare system, and known as a hub for international businesses in different economic sectors. This economic status reflected in the job market by reducing the unemployment rate to 3.6%, which is one of the lowest unemployment rates in the region (World Bank Report, 2016).

Although the overall economic status looked positive, the government of UAE were ambitious in sustaining the social and economic growth. Therefore, the UAE Government has recently updated its future directions through several national strategies and agendas (i.e., National Strategy for Advanced Innovation, National Advanced Sciences Agenda 2031, and the 2021 Advanced Science Strategy). Those concerned strategies have been proposed to promote sustainable knowledge-based economy through paying much attention to science, innovation, and emerging technologies, particularly in seven targeted industries (renewable and clean energy, transportation, technology, education, health, water, and space). Also, specific priorities have been set such as promoting entrepreneurship, aiming to make the UAE as one of the most attractive countries for entrepreneurs.

However, one of the major concerns that the UAE faces is that the expatriates became a dominating workforce in the private sector, while the majority of the national workforce is utilised in the public sector. This challenge is considered one of the major obstacles to achieving national agendas and strategies. Therefore, the government have

decided to shift the future workforce towards the private sector and entrepreneurship and to be supported by several economic sectors and under conducive legislation.

The UAE leadership firmly believes that investing in human and natural capabilities would be the primary driver to develop solutions for future socio-economic challenges. In this regard, the UAE government is aware that enabling national capabilities entails mainly providing suitable education and skill-sets that could be sustaining the growth of their competencies in which they could develop applied knowledge and, in turn, develop new products and services that can have an economic and social impact. Therefore, several approaches have been addressed for developing capabilities such as business incubators that can enable transforming potential ideas into applied solutions.

Looking into the status of the UAE from the lenses of international indexes, the UAE has shown some positive results in many domains. The UAE ranked at 22nd in the World Bank's *Doing Business Report* taking the lead among Arab countries, as well as some emerging economies. Also, the UAE ranked 19th worldwide in the *Global Competitiveness Indicators* (GCI) as reported by the 2017 Global Innovation Index, which indicates that the ability of the UAE in producing new products that could be competing locally and globally. However, although the UAE is perceived as a more favourable business hub than other neighbouring countries in terms of entrepreneurship practices, it is ranked 86th in knowledge and technology production, which requires some improvement by focusing on producing more patents and knowledge that indicates shortage of knowledge and technology products that can find their way to the local market.

The Global Innovation Index (2017) also reported that the UAE did not score advance ranking in market sophistication (ranked 85th), which indicates that the UAE has to

improve its ability in knowledge absorption through its workforce. In this regard, the report of the GCI (2017) has indicated that UAE faces a bundle of challenges in capacity to get into innovation due to a severe shortage in the skilled national workforce, although the UAE is the 25th in university-industry collaboration regarding R&D activities. Consequently, the global related indexes have shown that the country will struggle in future to enhance its ranking, particularly in the output indicators, if the factor of capability development is not realised in the country.

1.3 Research Problem

The concept of business incubation has long been considering as one of the primary enablers for realising the National Innovation Strategy of the UAE that announced in 2014 to deliver innovative services and produce smart products. Consequently, the existing incubators have been established after the launch of Innovation Strategy. However, due to the novelty of the incubators in the country, few incubators have sustained their existence.

This research study is addressing several problems, such as:

i] First, since the studies of Elmansori (2014) and Al-Mubaraki and Schröl (2011), there was no a comprehensive study conducted on tackling the status of business incubations in the UAE mainly in terms of assessing their success level, method of measuring their performance, critical factors that affects their success, along with their expected roles in which it might support the socio-economic development plans in the UAE.

ii] Second, concerning the common entrepreneurship culture in the UAE, it reflects that there is an increasing number of young Emiratis who are interested in pursuing the development of their professional career in the entrepreneurship

domain. However, there are essential support should be available (e.g., funding, stable business environment) and acquired (e.g., business skills, analytic capabilities, forecasting) for enhancing the potential entrepreneurs in entering the business market with minimal risks (Al Saiqal, 2017). Such kinds of gaps are usually offered at business incubators in developed countries. Thus, there is a need for investigating all elements that might affect the progression of entrepreneurs in the UAE business context while they are incubated, to determine whether these elements are unique to the UAE or needed to be fulfilled.

iii] Third, globally, many scholars have recommended that the business incubation model would be as a suitable solution for solving a broad range of problems that might challenge the entrepreneurs (Lalkaka, 2001; AL-Mubaraki & Busler, 2014; Burnett, 2009). In the UAE case, the number of business incubators has recently been declined due to some legislative restrictions related to operating private business incubators in the mainland in the UAE. As a result, some private businesses incubators had to exist under free zone authority or move to co-working business, which is entirely different from running business incubators. Therefore, it is necessary to investigate the obstacles the business incubators might be faced in the UAE prior to creating convenient start-ups, as well as enabling them to increase their presence in the market. Such research investigations would be identifying some core conditions for business incubators to support entrepreneurs in the UAE effectively.

1.4 Research Justification

Bringing the UAE status into research perspective, studies showed that the SME sector plays a significant role in developing the local economies by producing value-added and efficient products and services, in turn, be able to offer job opportunities; particularly, for youth. Those successful SMEs who sustained in the market are led by individuals with entrepreneurial mindsets (Lish, 2012). However, due to several internal factors such as resource limitations as well as external market conditions, entrepreneurs face different types of challenges to access and sustain in the open market, while they are expected to compete against well-established large corporates (Hansen, Nohria, & Berger, 2000).

Therefore, economic tools, such as business incubators have been initiated by the public entities as one of the solutions for increasing the chance of their success in general, but also providing an opportunity for establishing start-ups that offer innovative solutions. As such, countries like the UAE aims to diversify its economy away from depending only on oil revenues must retain strategies for developing entrepreneurs to recognise opportunities with abilities to turn their innovative ideas into sustainable businesses. Ideally, business incubators could be considered as one of the best strategies that can realise nurturing entrepreneurs by taking them through the incubation cycle. In this regard, Alsheikh (2009) justified the need for establishing business incubators in Saudi Arabia due to its influence in decreasing the failure rate of entrepreneurial ventures, and in the same time feeding the SMEs in the market with unique products and services.

Although the UAE government has made some initiatives that promote SME development such as the announcement of bankruptcy law, however, more steps need

to be taken, particularly for supporting business incubators in the UAE. Having a majority of incubators that are sponsored by local governments, there is a need for understanding the obstacles that those incubators face in the UAE and identify the enabling factors that help them to support their main clients; the entrepreneurs. Thus, in order to support the entrepreneurship practices as per the National Innovation Strategy, this research will focus on one of the key enablers; the business incubators in the UAE.

The recent establishments of many business incubators in the UAE also justified tackling this phenomenon from different perspectives. At the national perspective, as more business incubators are expected to be established across the targeted industries in the UAE, the enabling factors for the success of business incubators are crucial to being investigated and address their influence. As far as from outcomes' perspectives, several studies from different parts of the world have investigated the benefits of business incubation initiative and their social and economic impacts (Kamdar, 2012, AL-Mubaraki, & Busler, 2014). Therefore, this study determines the expected roles of business incubators and whether they are aligned with the socio-economic plans of the UAE Government.

Moreover, from the research perspective, many scholars in the field have attempted to develop appropriate models for successful implementation of business incubation aiming to support the entrepreneurship ecosystem (Grandi, Grimaldi, 2004, & Graham, 2010; EL-Midany & Shalaby, 2009). The developed models accommodated all the necessary conditions for incubators to succeed. At the strategic level, business incubation around the world managed to inject potential start-ups into the market, while at the individual level, business incubators around the world have successfully

nurtured entrepreneurs, which resulted in creating job opportunities (Blackburne, 2014). However, in the UAE, and due to the recent establishment of a majority of business incubators, there was no set of conditions that was developed or discovered for successful implementation of business incubation initiative in the country. Therefore, there is a need for research that investigates the external environment that may influence the success of business incubators in the UAE.

1.5 Research Aim

The UAE Government has invested a considerable amount of Dirhams in establishing business incubators, aiming for their return-on-investment in the form of capable entrepreneurs that could be sustaining their businesses independently in the market, in turn, supporting the economic development and promote entrepreneurship culture at the country level. Thus, considering the strategic aim of the UAE towards knowledge-based economy, and in view of wide acceptance public and private sector of incubation concept in the UAE, this thesis aims to research business incubation in two dimensions; first, the study seeks to identify the enabling factors under which business incubators in the UAE are expected to be successful. Second, the study aims to examine the roles of business incubators at macro at micro levels in the UAE.

In the first dimension, due to the high investment of their establishment and operation, the success factors are crucial to being explored when establishing more incubators across the targeted industries in the UAE or even the current operating incubators. The study will attempt to build a set of conditions in the form of a framework for business incubation's success that is unique to the UAE environment. This framework will improve the efficiency of their operation to be considered by related stakeholders such as respective government entities, higher education institutions, and industry

developers. Also, the study outcomes are expected to support facilitating the success of incubated entrepreneurs and sustain their enterprises' growth.

In the second dimension of the study, the previously related scholars have examined the impact of the incubators (Blackburne, 2014; Moreira & Carvalho, 2012). In the UAE context, the incubation concept is considered a new initiative; however, due to the recent establishment of most of the current incubators in the UAE, it is worth to address their outcomes and determines their expected roles at the macro level, and how they are supporting entrepreneurship practices at the micro level directly.

1.5.1 Research Objectives

There is a shortage of empirical studies conducted on business incubators in the UAE context. Therefore, this research could be perceived as a baseline scholarly study as it was designed to be explanatory and descriptive, at the same time, aims at identifying the critical success factors of business incubators and their roles in the UAE, this thesis will use a multi-method approach combining desk-research, interviews, and surveys to achieve the studies' objectives. From these methods, a framework of business incubation's success in the UAE was developed and tested.

Therefore, this research attempts to achieve the following objectives:

i] To review the literature conducted on business incubators with a particular focus on GCC and UAE.

ii] To explore the success factors of business incubators and examine their roles in supporting the UAE's strategic objectives in general and entrepreneurship practices in particular.

iii] To describe how the internal enabling factors, concerning infrastructure, networking, human resources, and commercialisation conditions are expected to affect the success of business incubators in the UAE.

iv] To describe how the external enabling factors, concerning government support, financial resources, market conditions, and entrepreneurship culture are expected to affect the success of business incubators in the UAE.

1.5.2 Research Questions

The research questions are usually proposed to address and justify the study objectives. These research questions aim to collect useful data, which will be analysed aiming to generalise the findings and support the effectiveness of business incubators. In this regard, the existing scholarly works on business incubation covered such different aspects as evaluating their performance and assessing their roles. Those studies produced different results that contributed to the knowledge and understanding of business incubation.

This research targets different groups of business incubations' stakeholders to get their insights and views based on their actual experiences in two aspects; first, the factors that are currently affecting the success of business incubators in the UAE. Second, the roles of business incubators at a strategic level and the individual level in the country. Therefore, reflecting the research problem into research questions, this study addressed four research questions to cover four research dimensions:

i) The success of business incubation in the UAE: *What business incubation's success look like in the UAE*?

ii) The outcomes of business incubation in the UAE: *What are the expected roles of business incubation in the UAE*?

iii) Internal factors affecting the success of incubators in the UAE: *What are the critical internal factors that may impact the success of business incubators in the UAE*?

iv) External factors affecting the success of incubators in the UAE: *What are the critical external factors that may impact the success of business incubators in the UAE*?

1.6 Nature of the Study

The nature of the study is both exploratory and descriptive. Nevertheless, the author of this thesis reviewed existing theoretical models, frameworks, and critical success conditions to develop a framework for business incubations' success that could reflect the UAE situation. The framework consisted of three parts; these are i) the measurement of business incubations' success, ii) the factors that influence incubators' success, and iii) the roles expected from business incubators at the micro and macro level in the UAE.

In terms of the methodology used, this research adopted a mix research method using qualitative (semi-structured interview) and quantitative (structured survey questionnaire) approaches. The collection of secondary data aimed at achieving the first research objective by updating the knowledge related to the incubators in the GCC region, in general, and in the UAE, in particular. Whereas, a collection of the primary data aimed at achieving the second research objective targeting five categories of the incubators' stakeholders to explore the factors affecting the incubators' performance and examine their roles in the UAE.

To describe the nature of the factors affecting the success of the incubators, and their roles in the country, the primary data will be collected to achieve the third and fourth research objectives by targeting the management of incubators and their incubated entrepreneurs. Finally, based on the literature review conducted on each factor affecting the incubators' success of business incubators in the UAE, this research has developed a set of hypotheses to be tested throughout this study.

1.7 Outlines of the Dissertation

This dissertation consists of seven chapters as followings:

- Chapter 1 – *Introduction*: presents the study background with particular focus on UAE, followed by research justifications and problem, and ended with research aim, research objectives, research questions, and study nature.
- Chapter 2 – *Literature Review*: discusses the previous studies conducted on business incubation starting from its definition and going through its success factors, roles and services offered. Also, this chapter discusses business incubation studies within the GCC region. Finally, the addresses the UAE case in terms of business incubation practices as well as entrepreneurship status in the country.
- Chapter 3 – *Conceptual Business Incubation Framework in the UAE*: the components of the framework will be discussed in terms of its success factors and their roles based on previous studies. As a result, a set of factors for incubations' success with their roles as well as incubators' success measures will be suggested to be investigated throughout this study. Finally, a set of research hypothesis will be proposed to be tested during the study.

- Chapter 4 – *Research Methodology*: presents the research approach with justifications based on the previous related studies such as the methods used for data collection and analysis. Also, the data analysis approach will be presented, and the type of techniques used for analysing each set of collected data.
- Chapter 5 – *Data Collection and Analysis*: reports in details the procedures for collecting the data, the analysis of the data collected, and the results of the study.
- Chapter 6 – *Discussion of Analysis*: discusses the internal and external enabling factors that are affecting the success of incubators in the UAE. Also, the perception of incubations' success will be discussed. Moreover, the chapter will elaborate on the expectations of incubators in the UAE. Finally, the results of correlation and the regression analysis will be discussed in details.
- Chapter 7 – *Conclusion and Recommendations*: summarise the findings, develop recommendations, and suggest future related research. Also, the chapter will highlight research implications and present academic and practical contributions that can benefit the academic and professional communities in business incubation field.

For this study, specific procedural definitions of interesting terms are summarised in Appendix I, which elaborates some definitions related to the incubation field.

Chapter 2: Literature Review

2.1 Introduction

Developing socio-economic aspects have always been one of the main aims of the countries to improve the quality of life. However, in pursuing this goal, challenges such as empowering people and economic competition have always been an obstacle on the road. Therefore, countries like Singapore and South Korea have decided to update their approach of socio-economic development model by allocating entrepreneurship and innovation at the centre of their attention as a roadmap in order to reach their goals. Thus, those two countries have used platforms such as business incubation to promote entrepreneurship and innovation (Hamad & Arthur, 2012). Mazurkiewicz (2011), supported this view; he claimed that technology incubators are created to support the creation of innovation for the aim of transferring emerging technologies into viable commercialised businesses.

As such, the concept of business incubation has been viewed as one of the main dimensions when researching entrepreneurship. Therefore, it has been given extensive attention by scholars as well as industry professionals globally and recently within the GCC countries. Those academic and professional studies covered different dimension of incubation perspective, aiming for highlighting its benefits and impacts on different socio-economic aspects. As a result, more attention has been given by the decision makers, which resulted in establishing different types of incubators around the world, and recently within GCC region in order to enable the entrepreneurs to develop their ventures and access the market (Alsheikh, 2009).

This chapter focuses on academic literature as well as professional industry reports that address business incubation studies. The literature review is divided into three stages. Figure 1 summarises the structure of the literature review, which shows the three phases and its associated topics.

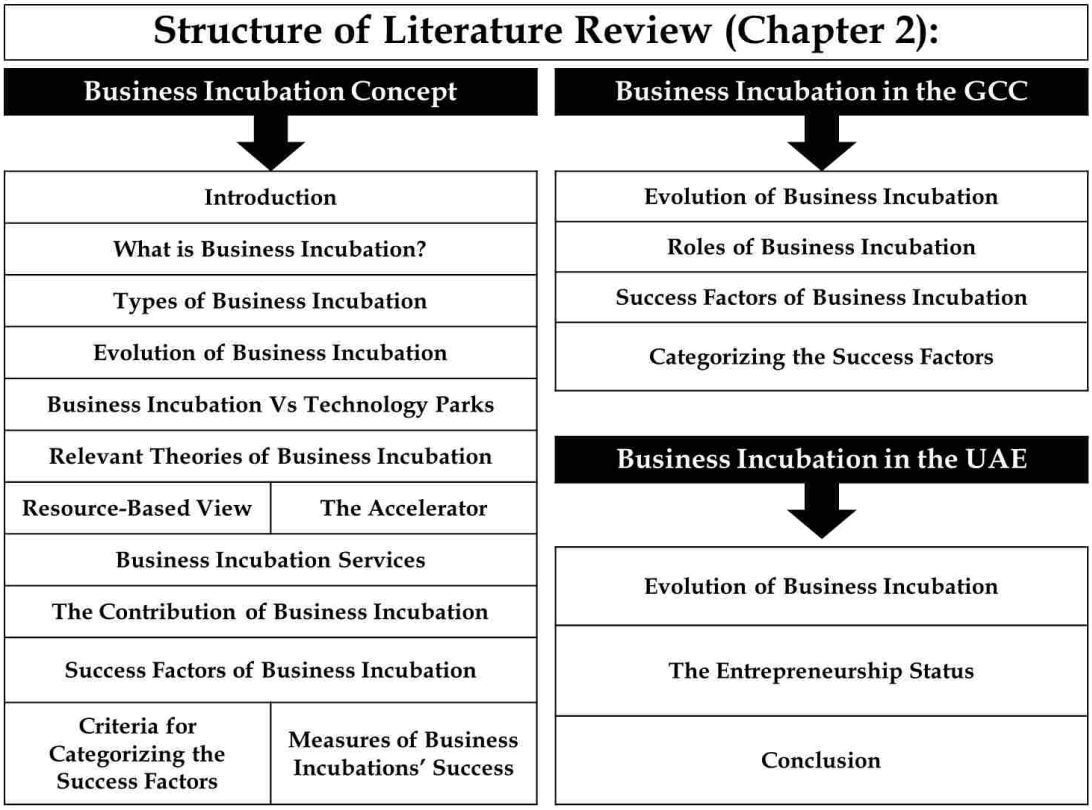

Figure 1: The structure of the literature review

In the first stage, fundamental aspects of incubation will be disused such as their evolution, type, services, outcomes, success factors, and their roles. In the second stage, and due to witnessing some research gaps in the field of business incubation, the study collected and discussed the recent literature within the GCC region to develop a set of conditions that are unique to the GCC domain; particularly exploring the area of critical factors for business incubators to succeed, as well as their current benefits, and therefore, their expected roles at macro and micro level. In this regard, collecting secondary data within the GCC region will be useful in three ways; first, it

shows how scholars and industry professionals in the region measured the success of all types of incubators comparing to another part of the world. Second, it helps to validate the success factors of incubators and their current roles in the conceptual framework, which will be developed for the UAE.

In the third stage of the literature review, the discussion will focus on the evolution of business incubation and their roles in the UAE. Also, special attention will be given to entrepreneurship status and their challenges in the UAE, as well as the importance of business incubation for the country. However, it is worth mentioning that due to limited literature discussing those two dimensions within the UAE domain, the sources of data collection will be expanded to cover academic papers, private sectors reports, and government-related documents.

2.2 What is Business Incubation?

Transferring applicable ideas into commercialised products and services through entrepreneurial ventures has not been an easy journey. In this regard, different approaches have been adopted by different countries to increase the chance of realising those ideas. Due to this complexity of entrepreneurship journey, defining business incubation has been an on-going debate among related researchers as well as industry practitioners. The challenge toward agreeing on the standard definition by both sides are attributed to standardise the understanding of the concept itself, especially with the enormous growth of incubators and their type around the world.

In the past twenty years, both scholar and professional associations conducted several studies to distinguish the business incubation from other entrepreneurial support programmes. Burnett (2009) claimed that early researchers focused on what is business incubation and their functions, while recent scholars tried to define business incubation

from its objectives, ownership, and its impact. For instance, some scholars built their definition based on the term itself (incubate); while Sithole and Rugimbana (2014) claimed that incubation has to offer supporting elements under a positive atmosphere. Similarly, Lish (2012) defined business incubator as a body that increases the chance of start-up success through needed services at suitable phases in which they can grow independently beyond the incubator stage.

On the other hand, other researchers viewed business incubation as a strategic initiative that covers the entire phases of incubation cycle. Mohd-Yunos (2002) described the incubation as several support organisations that help entrepreneurs to develop their idea from initiation until commercialisation under one system. Burnett (2009) shared the same holistic definition by emphasising the growth of new businesses under supportive physical and soft resources. Likewise, Bruneel & Ratinho, Clarysse & Groen (2012) defined it as a viable tool that accelerates the growth of entrepreneurial companies by supporting them with physical facilities and value-added services.

At country perspective, as business incubation initiatives have been extensively developed in the United States, most researchers adopted the definition of the National Business Incubation Association (NBIA) to the business incubation as a primary reference. Thus, NBIA defines business incubation as:

> "*A dynamic process of business enterprise development. Incubators nurture young firms, helping them to survive and grow during the start-up period when they are most vulnerable. Incubators provide hands-on assistance, access to financing, and orchestrated exposure to critical business or technical support services. They also offer entrepreneurial firms shared office services, access to equipment, flexible leases, and expandable space - all under one roof*".

Moreover, being an NGO that supports the practices of business incubation across the world, the NBIA tried to unify the understanding of business incubation definition by defining its most essential elements; the process, the goals, the services offered, its benefits, and its impacts. However, the European Commission (2002) defined business incubation with a broader context to embrace services and growth opportunities, as:

> *"An organisation that accelerates and systematises the process of creating successful enterprises by providing them with a comprehensive and integrated range of support, including incubator space, business support services, and clustering and networking opportunities. By providing their clients with services on a 'one-stop-shop' basis and enabling overheads to be reduced by sharing costs, business incubators significantly improve the survival and growth prospects of new start-ups".*

Thus, defining business incubation is not an easy mission to generalise. Although some of the definitions coming from industry practitioners are aligned with scholars, especially when discussing the "incubate" concept, however, aligning the definition remains a challenge between both sides, particularly from its objectives, sponsors, and its effects' perspectives. Therefore, for this study, business incubation will be defined as "an economic development platform for creating and nurturing entrepreneurial enterprises, through providing a value proposition that integrates shared facilities and services under one umbrella in order to commercialise the entrepreneurial projects and sustain their growth away from incubation".

2.3 Types of Business Incubation

Numerous studies around the world have attempted to highlight business incubation types. Scholars as well as industry practitioners classified business incubators based on different criteria. D'Agostino and Thriffiley (2001) claimed that business incubation

is developed based on the purpose of their sponsors. Some other researchers categorised them based on the financial aspect, which may affect the objectives of establishing the incubator. In this regard, Böhringer (2006) showed a couple of examples of business incubators, such as:

- Policymakers aim for technology promotion.
- Public entity aims for creating jobs.
- University-based seeks to commercialise its research projects.
- Venture capitalists aim for potential innovation to gain profit.

Likewise, corporate entities usually establish incubators to develop entrepreneurial projects or to support small external enterprises for potential business expansion (Hansen, Nohria, & Berger, 2000). Böhringer (2006) also proposed more dimensions for classifying the incubators that related to their specialisation for satisfying specific social and economic needs in particular country and supports its national strategy. The researcher also highlighted the trend of hybrid classification, in which could accommodate different interests of their sponsors (e.g. public entity, corporate needs).

Because of a diversified range of incubators around the world, some scholars have decided to go even more in-depth when classifying them by their structure; however, services, and operation. Böhringer (2006) collected various studies, which relates to university-based incubations, corporate incubators, for and non-for-profit incubators, and virtual incubators. Those in-depth studies have certainly enhanced the understanding of various types of business incubators as well as models used for each to succeed. Thus, Böhringer (2006) suggested to classify the types according to i) their sponsorship source, ii) their objectives, and iii) to their sector that they are serving.

Other scholars classified business incubation based on a model that is suitable for their mission (Hires, 2010), wherein a specific situation; their objectives may encounter multiple requirements that need to be addressed. Barrow (2001) and Lewis (2001) agreed with such a situation; the researchers showed that clients of incubators might form under a group of integrated projects, a specific sector, or in a general form that provides a wide range of services. The researchers indicated that those categories might standalone, embedded within a larger organisation, co-operated by different parties, or act as a virtual in which it is supported from a distance.

It is worth mentioning the type of joint-venture incubator in which a government entity or a university can collaborate with the private sector to form an incubator. Barrow (2001) revealed that such a model might increase the chance of return on investment and commercialisation. The researcher emphasised that this kind of incubator could be a real example of corporate social responsibility initiated by private sector companies towards entrepreneurs at the local community who are trying to access the private sector.

The NBIA had their say as well in types of business incubation. According to Al-Mubaraki & Busler (2010), NBIA depends mainly on the profit aspect, although the non-profit incubators are dominant in the USA, Al-Mubaraki & Busler (2010) showed that the type of services offered depends on the type of client they are serving. Thus, the NBIA divided business incubation according to: i) Self-financed incubators, ii) University or public run incubators, and iii) Mission-oriented incubators to achieve their targets. The researchers claimed that while not-for-profit type is focused on social and economic developments such as spinning out applied technologies, the profit-making incubators seeks a return on investment through start-up companies.

Bringing the context of all above into practice, Burnett (2009) summarised the incubation typology in Australia into the following categories:

i] Embedded model: small and dependent on a larger entity.

ii] Networking model: depends on sharing resources and services.

iii] Objective based model: serving specific industries or customers.

iv] Standard independent model: more industrial than office based

v] Virtual model depends on visits and e-services.

Thus, as claimed by Hires (2010), the incubation can be established based on a model that serves its stakeholders' requirements. However, those models can be updated if those requirements have been changed to accommodate the new socio-economic needs, especially with the emerging technologies and changes in market conditions.

2.4 Evolution of Business Incubation

The concept of incubation has evolved rapidly science 1959. Hackett and Dilts (2004) dedicated their research reviewing incubators' literature to highlight insights for future studies. Based on 38 studies, the researchers divided the studies into five core dimensions: i) The impacts over the years, ii) The configuration over the years, iii) The evolution over the years, iv) The development of incubators, and iv) Theories applied to business incubation.

It is worth mentioning that the first business incubation was created at Batavia in the United States in 1959 (Cornelius & Bhabra-Remedios, 2003), the researchers claimed that the government established the incubator to support the local economy, which was followed by other local entities in the 1970s and 1980s due to economic crises as well. As the awareness of the incubation concept and its impacts on small businesses expanded, local universities encouraged to follow the trend and establish more

incubators. However, Verma (2005) revealed that the modern form of incubators was established in the UK in the 1970s with two approaches of strategy; one focused on leasing space for entrepreneurs to work; their success was measured by spaces that were leased.

The second strategy was to enhance the services in order for small companies to grow; their success was measured by the expansion of the small companies away from the incubator. After 1990, incubators became more mission oriented and specialised; Verma (2005) indicated that incubators were linked with other socio-economic requirements such as creating jobs and increasing the access of SMEs in the market. Furthermore, incubators started to become more focused by serving specific industries such as information technology, especially after the emergence of the internet in the late 1990s, while virtual incubators started to arise and take momentum and gain more acceptance due to its cost efficiency (Verma, 2005).

In the context of United States, having a vast number of active business incubators in the world, Al-Mubaraki and Busler (2010) researched the evolution history of incubators in the USA, the researchers revealed that the concept of incubators started to take off in the mid of 1980s as a result of industrial development and maturity, which created jobs for small businesses and resulting in the establishing of the NBIA in 1995. As a result, it has been estimated that more than 1400 incubators are operating in North America and around 5000 globally (NBIA 2007), with the expectation of this number to be increased in all continents as a result of socio-economic challenges and requirements. Hackett and Dilts (2004) attributed this demand because of i) support of federally funded research, ii) increase the recognition of intellectual property rights

and innovation by the legal system, and iii) the potential of profit opportunities from commercialised research.

Therefore, it was observed that public organisations led the evolution of business incubation initiative in order to create jobs and commercialise innovations at universities. The learning lessons from previous incubators have helped other emerging incubators to be established and developed; therefore, the private entities, as well as universities, followed incubation trend (Somsuk, Wonglimpiyarat, & Laosirihongthong, 2012); the researchers presented three main reasons for the significant increase in business incubation initiative after the 1980s, which were: i) The motivation for conducting university research projects, ii) The potential for profits from research projects, and iii) The recognition of intellectual property rights.

In this regard, many success stories around the world have been investigated, which can be benchmarked such as Purdue Research Park in the USA, Cambridge Science Park in the UK, and the Ideon Science Park in Sweden (Somsuk, Wonglimpiyarat, & Laosirihongthong, 2012). Lately, newly established incubators (mainly private funded ones) started to give more attention to improving their services; aiming for adding value to their clients such as access to capital, expertise, and customers.

These new offerings have been introduced in order to reduce the operating cost of newly established businesses and enhance their efficiency and productivities (Grimaldi & Grandi, 2005). Therefore, based on the enormous change in technological development and the global economy as well as social aspects, business incubators have been modified since 1970. Lalkaka (2001) summarised this evolution into three stages, which are:

- First-generation of the incubators in the 1980s- *Space and facilities offered to entrepreneurs*.
- Second-generation of the incubators in the 1990s- *Value-added services, as counselling, fund, and networking offering support to entrepreneurs for creating start-ups*.
- Third-generation incubators after 2000- *Higher value proposition related to legal support, processing intellectual property rights, technology sourcing, and sharing experiences*.

2.5 Business Incubation and Technology Park

Business incubators and science parks have become a worldwide trend, particularly within the environment of universities. When it comes to infrastructure and investment, Science Park is considered much larger. Also, unlike the case of incubators, science parks are not expected to provide comprehensive business support, and this is where they bring incubators to do that for the early stage of forming companies. In terms of differentiation, research studies and industry reports have distinguished business incubation than other related terms mainly science parks.

In their study, Somsuk, Wonglimpiyarat, and Laosirihongthong (2012) showed the general concepts of incubators and science parks by highlighting the area of their connectivity and integration. However, although science parks and incubators are different in terms of their overall objectives, Ratinho & Henriques (2010) highlighted some similarities between both about technology development, job creation, and the facilities offered within the property. Industry professionals had the same view in which both initiatives provide soft and physical resources for business development (NBIA, 2007).

Concerning the roles of science parks, scholars identified many roles that science parks might play and make an impact. Jamil, Ismail, & Mahmood (2015) demonstrated various studies regarding the role of technology parks in promoting R&D, commercialisation, job creation, and economic growth. The researcher defined technology parks as "*an entity that supports innovation, industry-university collaboration, develops knowledge organisations commercialise products and* services, and forms new ventures". Kharabsheh (2012) added that the science park could also accommodate scientific research, technological innovation, and provide facilities for technology-oriented companies to develop their market. Furthermore, Huibing and Nengli (2005) went even further by highlighting the roles of technology parks in becoming a source of revenue generation for universities through commercialising their applied research.

On the other hand, based on practitioner's perspective, the International Association of Science Parks (IASP) defined science parks as an entity that is property based which ties with universities to develop knowledge-based industries through tenant organizations (Basile, 2011), while the Italian Association of Science and Technology Parks (APSTI) defined the science parks as a system that supports scientific-technological research, new innovative entities, and R&D linkages (Basile, 2011). In conclusion, it was noticed that numerous studies defined science parks and how it differs than business incubators. Somsuk, Wonglimpiyarat, and Laosirihongthong (2012) and Obeidat & Abu-Shanab (2010) identified the general concepts of science parks and business incubators, which are summarised in Table 1.

Table 1: General Concepts of Business Incubators and Science Parks

Business Incubators	Science Parks
Incubates entrepreneurial enterprises.	Nurtures the growth of new small companies, transfer the university know-now, and develop innovative products
Provides a range of services to its tenants such as rental space, lab, marketing, mentoring, access to funding, etc.	Accommodate mature firms graduated from business incubations to grow into fully-fledged businesses in a competitive market.
Have close ties with research institutions to commercialise new products and services via innovative entrepreneurial ventures.	Have close ties with industries to transfer technologies and promote innovations.
Provide support for start-up businesses, which they have to leave when ready.	Have the knowledge transfer function and contribute to economic development.

2.6 Relevant Theories of Business Incubation

Business incubation theories went through extensive debates by related scholars. While previous related studies have been focused on their types, success factors, and effectiveness, it is equally critical to research theories in which it describes and proposes the method of operating the incubator. According to Hunt (2002), the researcher claimed that theories help to explain and predicting certain phenomena through the systematised structure, and to be empirically testable.

Thus, it is essential to gain some insights into some business incubation models. In this regard, Hackett and Dilts (2004a) conducted an in-depth review on theoretical roots of business incubation; the researchers highlighted several theories such as entrepreneurship theories, structural contingency theory, and interdependent co-production modelling, which still did not cover the whole phenomenon of incubation concept. Some other scholars discussed the characteristics of business incubation models. Sithole and Rugimbana (2014) suggested addressing the features of different incubating models in order to understand how they operate, how they add value to their

clients, and how they accommodate the clients' requirements, while Bizzotto (2003) suggested a model that divides the incubation into three processes, which are:

- Pre-incubation: potential projects that could be converted into commercial enterprises.
- Incubation: entrepreneurs that are provided services with facilities.
- Post-incubation: entrepreneurs to take-off stage in the open market.

From the professionals' perspective, the European Commission (2002), as illustrated in Figure 2, provided an input-output driven model for business incubators to follow, in which it consists of three phases: i) Input: related to stakeholder inputs (e.g., fund), ii) Process: related to added value services (e.g., mentoring), and iii) Output: related to wealth creation impact (e.g., sustainability). Figure 2 illustrates the incubator model.

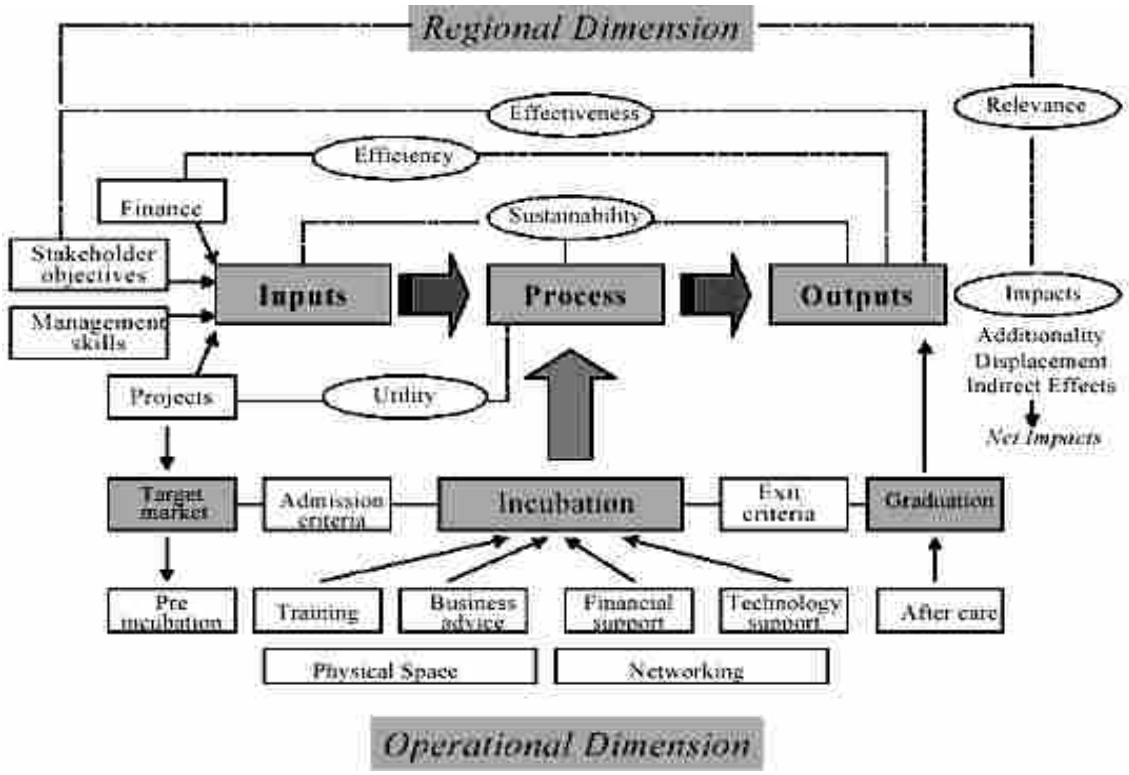

Figure 2: Business incubator model

Scholars conducted many studies addressing different examples of business incubation theories and models. Graham (2010) claimed that profit-making business incubators are good as delivering value-based funding, which is focused on value and outcomes, while the non-profit public incubators are focused on justifying the dispersing of the fund. In order to make the business incubation model viable and sustained, the researcher emphasised three main stakeholders that the business incubator should satisfy: i) the start-ups, ii) the facility, and iii) the investors.

Some other scholars studied other theories of business incubation, such as:

i] *Structural Contingency Theory* depends on the degree of matching between the client and the incubators' expertise, which is commonly used at university-based incubators (O'Neal, 2005; Knopp, 2007).

ii] *Interdependent co-production modelling*: Focuses more on soft infrastructure and processes of incubation as an enabler of clients' success such as access to finance, network, and expertise (Hackett & Dilts, 2004b).

iii] *Real Options Theory*: Lish (2012) showed the benefits of "real option" theory in inspecting and auditing the validity of incubation processes, and helping incubatees to identify their challenges at an earlier stage and avoid the high impact of their failure. The real options theory is distinguished by the clarity of its processes, resources, and procedures during the incubation cycle, which tries to maximise the return on investment (Hackett & Dilts, 2008).

iv] *The Network Theory* depends on the potential and impact of clustering entrepreneurs and services offered that contribute to collective success. It adopts an interaction approach among entrepreneurs to expose them to various resources inside and outside incubators' capacity to succeed (O'Neal, 2005).

However, as a result of socio-economic changes, it is expected from business incubation models to sustain its development, so due to the advancement of technologies that affect the business/market conditions, incubators around the world should consider adding the technology aspect into their existing model. According to Chen and Batchuluun (2012), the researchers believed that incubators require integrating the technology into the triple-helix relationship (private sector companies, universities, and government) in order to enhance their productivity and sustainability of their growth. Therefore, while keeping into consideration the type of incubator, it would be useful to have some criteria when selecting an appropriate model that makes the incubator a successful one.

In this regard, Bergek and Norrman (2008) conducted a study aiming for developing a framework for selecting a model for incubators, which can be used for several policymakers as well as for those involved in establishing business incubation. The researchers developed a framework of three components: selection, business support, and mediation. The framework requires assessing their results compared to their objectives in the context of the three components as illustrated in Figure 3.

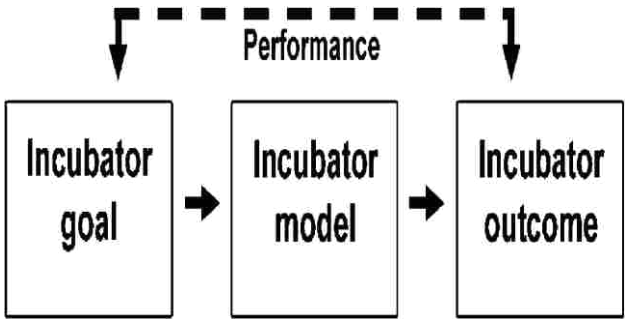

Figure 3: Evaluation model

Putting the above discussion about business incubation into practice, it would be beneficial to highlight some of the models that are applied around the world. Grandi and Grimaldi (2004) developed a case study research on Italian incubation industry. The researchers presented two categories of business incubation models. Model one represents public business incubators, which aims for reducing the cost of start-ups, and focusing on local markets through local networking, while model two reflects private incubators aiming for accelerating the start-up process of entrepreneurial ventures and focusing on technologies and value-added and specialised services. Concerning university-based incubators, and due to the opportunity of spinning-off applied research projects, the researchers revealed that they are more with model two (private incubators) as they are focused in specialised markets.

Al-Mubaraki and Busler (2010) conducted an exploratory study on business incubators in both the UK and USA aiming at proposing a global business incubator model putting into the consideration the prevailing cultural and objectives variations. In the USA, being a pioneer in establishing business incubation, the authors found that the business incubators (public, private and university-based) are diversified in term of their objectives but commonly sharing in providing value-added services and networking. In contrast, the authors found that the business incubators in the UK are embracing innovation enterprises in order to cope with the market and technological changes through systematic networking and supported by national policies. In the next Section, more highlights will be given on the most two standard theories of business incubation, which was conducted by relevant researchers.

2.6.1 Resource-based View Theory

The resource based-view theory has been developed as part of strategic management studies to describe the performance patterns. Somsuk, Laosirihongthong, and Mclean (2012) explained this theory as firms that combine a group of valuable, unique resources and capabilities, which gives them a competitive advantage. The researchers claimed that the resource based-view theory could be applied by a different type of incubators, which enable them to use such resources to build a competitive advantage. In this regard, although some previous studies criticised the theory in terms of its applicability, Sithole and Rugimbana (2014) have shown that many university-based incubators adopted the theory. As far as its characteristics, the resource-based view theory depends on the usage of the specialised resources offered by the incubator to their clients in order to gain a competitive advantage. These resources are offered irrespective of the process implemented at the incubation. Also, the theory perceives incubator as a catalyst for utilising available resources (Hackett & Dilts, 2008).

Somsuk, Laosirihongthong, and Mclean (2012) employed resource based-view theory conducted a case study in Thailand aimed to explore the enabling factors affecting the success of university-based incubators and the priorities of those factors. After adopting the theory, the researchers identified 14 enabling factors and classified them into four categories (human, financial, technological, and organisational resources). Their results showed that “talented managers” were considered as the most influential factor, while “infrastructure” was considered the least influential factor. The researchers recommended that Thailand needs to consider those factors and their priorities when developing future university-based incubators. Sithole and Rugimbana (2014) agreed with these recommendations, in their study findings, the researchers

suggested that the resources of university-based incubators are critical to its success, which may enhance their competitive advantage.

In another case at Spain, and in order to investigate the success of the entrepreneurial ventures at universities, some scholars used resource-based view theory as a tool to understand why some entrepreneurs could reach to spin-offs stage while others cannot. Pazos, López, González, and Sandiás (2012) used the resource-based view to investigate the relation between the spin-off and some related activities (factors). Their results showed a couple of associations that are crucially related to spin-offs' success such as industry-funded research, the orientation of the research, and the existence of services.

The theory helped the researchers to classify the resources available to entrepreneurs into four types: organisational, human, financial, and commercial. Powers and McDougall (2005) got almost similar results in the United States; the researcher used the framework of the resource-based view to examine the impact of specific resources on some start-ups established. Their results revealed that some of the resources are an essential predictor for start-up creation such as scientific capabilities, the level of the fund by venture capital, and the age of technology transfer office.

2.6.2 The Accelerator Model

Due to challenges faced by entrepreneurs in accessing business ecosystem, a new model has been appeared in recent years, trying to support entrepreneurial ventures, and it was referred to as "business accelerators". This new supportive mechanism assists potential entrepreneurs through access to potential partners and specialised resources. However, business accelerators are yet under the evolving stage. Therefore, it is not a guaranteed mechanism for entrepreneurial success.

From a research perspective, given the fact that business accelerator is a new phenomenon, there are few types of research conducted about business accelerators. According to Cohen and Hochberg (2014), business accelerator-related studies are conceptual depending on few case studies for comparison reasons and are not empirically researched, even those case studies are general and not focusing on specific sectors.

Nevertheless, the business accelerator model started to be accepted by different countries especially in the last five years. According to Pauwels, Clarysse, Wright, and Van Hove (2016), due to some weaknesses of some previous business incubation models (mainly focusing on renting spaces), business accelerator programs started to emerge in Europe, predominantly in mid of 2000s, while the first business accelerator program in the USA was initiated in 2005 called "Y Combinator" at Cambridge, Massachusetts; the accelerator initiative was an inspiration for others to benchmark, especially in Silicon Valley. As this initiative gained momentum around the world, Cohen and Hochberg (2014) estimated over 2000 accelerator programs that were established in the globe. In response to this vast number of establishments, scholars started to research business incubators' evolution, characteristics, and classifications, while operators of business accelerators started to become focused by targeting specific sectors such as ICT and programming (Cohen & Hochberg, 2014).

Academic researchers as well as industry practitioners broadly defined business accelerator program. Pauwels, Clarysse, Wright, and Van Hove (2016) defined accelerator program as an intensive mechanism of focused knowledge and support services aiming to accelerate the creation of entrepreneurial ventures within a short period. This new emerging mechanism managed to attract potential entrepreneurs by

supporting them with relevant services and networking. Cohen and Hochberg (2014) agreed with this description; the researchers claimed that business accelerators help new ventures to develop their projects, define their market segments, provide seed fund, secure resources, and process those activities within three months. At the end of the period, the accelerator program usually provides "demo days" for entrepreneurs to present their ventures in front of potential investors, venture capitalists, and some other successful entrepreneurs.

From industry practitioners' perspective, the European Commission addressed a new type of business incubator called "new economy incubator", which is defined as a profit-making incubator mechanism and has a virtual presence aiming to accelerate start-ups especially within ICT sectors (Commission, 2002). Start-ups give up some percentage of their equity to join the accelerator. Van Huijgevoort (2012) highlighted several similarities between "new economy incubator" and business accelerator programs as the followings: i) For-profit nature, ii) Not for creating jobs, and iii) Focus on networking.

Also, Komi, Still, Wallin, and Jaring (2015) summarised the key features of accelerators, which distinguish them from another business incubator, such as:

- Providing investments in exchange for an agreed percentage of start-up equity.
- An intensive and specialised mentoring.
- A limited period to develop the venture and ended with "demo days".
- A cohort approach with small teams.

Although business accelerators and business incubators are both offer some similar services, as well as aim for helping entrepreneurial ventures to create and grow their businesses, they still have some differences. A critical difference shows in their legal

status, whereas most of the incubators are usually not for profit entity, while accelerators are for-profit entities established by their sponsors to return on investment through efficient validation of new business ideas generated by potential entrepreneurs, and mainly in the ICT sectors.

Cohen and Hochberg (2014) indicated that the short duration of accelerator programs is one of the key differences from another type of business incubators, which impacts on the other features that both may have such as the period of mentorship, networking, and the spaces given to their customers. Moreover, business accelerators are sometimes mixed-up with angel investors due to both offering equity investment. Therefore, as shown in Table 2, the researchers summarised the key differences between business accelerator, business incubators, and angel investors.

Table 2: Differences between accelerator, incubators, and angel investors

Features	Accelerators	Incubators	Angel Investors
Duration	Three Months	One – five years	Ongoing
Cohorts	Yes	No	No
Business Model	Investment; non-profit	Rent; non-profit	Investment
Selection Frequency	Competitive, cyclical	Non-competitive	Competitive; ongoing
Venture Stage	Early	Early or late	Early
Education offered	Seminars	Ad hoc, hr/legal on-site	Non
Venture location	Usually on-site	On-site	Non
Mentorship	Intense by self and others	Minimal, tactical	Off

In conclusion, from an investment perspective, the accelerator model is a trending mechanism applied by venture capitalists, it was noticed that accelerator programs are mainly applied in technology-related start-ups. As far as the entrepreneurs' perspective, accelerator programs are a good approach for seeking external capital

while decreasing the risk of entering a competitive market. Local economies are also benefiting from this model by promoting entrepreneurship and innovation, which may positively impact their socio-economic growth. However, studies showed that entrepreneurs should consider five factors when deciding to join business accelerator programs (Cohen & Hochberg, 2014), which are the followings:

Passing the idea development through four stages.

i] Having suitable related expertise.

ii] Policies and conditions for joining the accelerator programmes.

iii] Nature of services provided by the accelerator program with their cost.

iv] The networking facilities provided by the accelerator programmes.

Thus, we can find the accelerator programs are branded by their competitive selection, the intensity of mentoring and networking, and efficiency of their operation.

2.7 Business Incubation Services

A business incubator is a systemised structure with processes that aims to support creating new entrepreneurial enterprises. The incubators usually provide a value-added service to their clients beyond office space facilities. In order to improve the chance of their clients' success, a range of services are provided among business incubator lifecycle, starting from shared administrative facilities, marketing support, legal assistance, access to fund, labs and equipment's, and networking resources. Abduh, D'Souza, Quazi, and Burley (2007) rationalised the provision of such services due to lack of critical success factors by new entrepreneurial ventures. The authors argued that insufficient capital, networking, and technical assistance created an obstacle for entrepreneurs to create start-ups and sustain them in the open market.

Also, scholars argued that business incubators had evolved especially is in the last 15 years. Due to new challenges of market competition, the question remains whether the services offered to their clients have evolved as well. In this regard, Bruneel, Ratinho, Clarysse, and Groen (2012) conducted a study comparing the incubation services for the three generations. The authors argued that the third generation of business incubation had developed their services to face the challenges of market competition in order for new firms to succeed. The authors indicated that the first and second generations were more responsive to policymakers than tenants, in terms of services offered, while the third generation has equally satisfied the owners of incubators as well as their clients. The third generation of incubators was more concerned with clients' scope by maximising the services offered and genuinely enable them to create start-ups.

Bringing the context of business incubation services to live cases, Mohd-Yunos (2002) highlighted the business incubation practices in Malaysia; the researcher summarised the services offered by their business incubators as following:

- Flexible, affordable, and temporary basis space.
- Sharing administrative services.
- Business counselling services related to planning, R&D, and training
- Networking and matchmaking activities.
- Outreach services after graduation to sustain the growth.

Many scholars in the field had different views about the most important services to be offered at business incubators. Böhringer (2006) emphasised on funding services as one of the major elements for new enterprises to grow and sustain after they graduate from the incubator, while Al-Mubaraki & Busler (2010) suggested having

management team with experience in training, developing and supporting entrepreneurs during their stay at the incubation, as well as sustaining their businesses after they graduate. In their subsequent research, Al Mubarak and Busler (2011) presented fifteen services that business incubators usually provide, these are:

- Advises for best partners.
- Consultation for management activities.
- Expose to venture capital.
- Fund access.
- Guidance to education resources.
- ICT services.
- Managing finance.
- Market guidance.
- Mentoring services.
- Networking businesses.
- Offer business support.
- Soft skills such as presentation skills.
- Support in regulatory compliance services.
- Support technology transfer.
- Training for start-ups.

Fernández, Blanco, and Cuadrado (2015) agreed with the critical role of incubators' management. Based on the definition of NBIA, the researchers claimed that management of incubator is the ones who orchestrate the services offered to their clients in term of when, how, and where to offer these value-added services. In this regard, the researchers grouped the services into three phases, which are:

i] *The pre-incubation phase* offers activities for idea development and develops business plans to turn them into entrepreneurial enterprises.

ii] *The incubation phase* offers a variety of services to materialise the enterprise such as technical consultancy, networking, and logistics.

iii] *The post-incubation phase* offers extended services to graduated enterprises for business sustainability such as access to further fund and customers.

In an alternative view, Abduh, D'Souza, Quazi, and Burley (2007) categorised the services into three groups, which are:

i] *Facilities related services*, such as renting affordable and flexible spaces with building facilities (rooms, office equipment, and the like).

ii] *Counselling and business assistance related services* that are providing a range of business development support services (business plans, legal, and the like).

iii] *Accessibility to incubator networks* providing internal and external networks and information related to the market.

As far as industry professionals view concerning the incubation services, the NBIA suggested couple services that the incubator should provide to be categorized as a right incubator, which could be some of the followings (Alsheikh, 2009): i) Networking exposure, ii) Technical expertise, iii) Access to fund, and iv) Internal and external shared services. Thus, services and resources offered by the business incubators should be considered an added value for their clients that usually are a challenge to be found in other platforms or alone. However, it is worth mentioning that the mechanism of offering such services and their type are critical to clients of business incubators. In this regard, business incubators should position itself as a unique platform that differs from traditional property management entities by truly customising their clients' needs

in terms of i) shared services, ii) resources and iii) facilities aiming for clients to exit the incubator after gaining a group of valued added services that can help them to stand alone in the market.

2.8 The Roles of Business Incubation

Business incubators around the world have shown a positive impact on social and economic development. The expansion of the incubation concept in different continents is attributed to the successful benchmark of applying incubation models for achieving some tangible benefits such as creating start-ups and creating jobs. When benchmarking some successful business incubation in different countries, AL-Mubaraki and Busler, (2014) noticed that creating small businesses as well as jobs were considered the most strategic benefits gained from business incubators, while Aberham (2011) emphasised on the enhancement of economic growth via technology diffusion and commercialisation brought from technology incubators.

Some scholars discussed the benefits gained from business incubators from incubated entrepreneurs' perspective. Those benefits gained by entrepreneurs may be categorised into tangible and intangible benefits. According to Bøllingtoft and Ulhøi (2005), entrepreneurs require tangible resources such as the physical space, incubator facilities, and office with needed equipment, while in the same time; they need intangible resources such as networking, mentoring, and access to funding. In those two categories, the incubated entrepreneurs gain hands-on experience that makes them progress in their entrepreneurship journey.

With regards to operating start-ups within incubators, evidence showed that business incubators effectively reduce the operating expenses by providing facilities and resources at subsidised rates while start-ups are at a vulnerable stage in the market

(McAdam & Marlow, 2007). Another important aspect concerning the operation of entrepreneurial businesses is credibility and reputation. According to McAdam and Marlow (2007), accepted entrepreneurial ventures at incubators has more credibility among suppliers and customers due to their reliable acceptance criteria at incubators and the potential of their businesses, which could be more attractive for venture capitalists. This advantage becomes even more viable when incubators are attached to universities, as they are more exposed to better facilities, networks, expertise, and resources.

Westhead and Storey (1995) claimed that incubators that are attached to universities have a higher success rate comparing to those are not independent, as they are more exposed to better facilities, networks, and resources. Technology business incubators attached to universities are a great resource for local researchers, as well as engineers to create viable new technology start-ups while benefiting the community through hiring part-time students or full-time university graduates (Aberham, 2011). Another specific aspect of incubators' impact is the financial return. Based on the industry reports, Knopp (2007) showed that the return on the investment from business incubators is more than 22$ per each dollar invested in the business incubation. In the same time, business incubators play an essential role in reducing the failure rate of establishing new entrepreneurial start-ups. Also, those business incubators showed a good return on investment over the years (Al-Mubaraki & Busler, 2013).

As a result, scholars categorised the roles of business incubations for better analysis. Claggett (2003) classified the roles into four different groups, which are:

- *Business Formation* provides support to idea development for the commercialisation purpose.

- *Business Stabilization* supports and sustains existed businesses.
- *Business Expansion* improves operations, productions, and growth.
- *Business Attraction* attracts external professionals to the region.

Thus, business incubation has several roles and benefits that positively affect individuals, corporates, and the community at large. On another hand, the roles may have a social perspective such as creating jobs, and well as economic perspectives such as developing local businesses. Also, the private sector is also benefiting from business incubation initiatives, mainly in terms of return on investment, while universities are taking advantage of business incubation in developing their applied R&D and commercialising their research.

2.9 Success Factors of Business Incubation

It is almost agreed by scholars and industry professionals that business incubator is a successful tool for nurturing potential entrepreneurs (Lish, 2012; Verma, 2004; Sun, Ni, & Leung, 2007). However, studies showed that not every business incubator are successful irrespective of their type. Therefore, scholars considered studying factors affecting business incubation's success due to its importance for local economies to grow in general and for entrepreneurs to be better served in particular. Concerning scholars investigating factors that influence the incubators' success, Lee and Osteryoung (2004) suggested fourteen successful factors to assess incubators' effectiveness.

While Lish (2012) proposed some other critical factors when addressing the antecedents of incubator's effectiveness. The researcher suggested eight antecedents, which are: i) Financial resources, ii) Fit applications/screening process, iii) Human

resources, iv) Informational resources, v) Legal resources, vi) Organisational resources, vii) Physical resources, and viii) Relational resources.

Thus, researchers did not agree on a specific list of success factors due to different types of business incubators, their sponsors, and their socio-economic objectives. Also, the influence of those factors may occur at different phases of the entrepreneurial venture's lifecycle at the business incubator. For instance, Hackett and Dilts (2004) revealed that the age of an incubator might influence the success of the incubator from the accumulation of knowledge and expertise perspective. Furthermore, the maturity of the local market that the incubator is serving as well as the degree of fit between the actual incubators' services and the actual needs of entrepreneurs may influence on the incubation's success. Moreover, the transfer of technical abilities may also affect business incubation success and the degree of transition of those technologies to commercial enterprises (Lee & Osteryoung, 2004).

Some other researchers investigated specific factors that affect the performance of the incubators. Sun, Ni, and Leung (2007) stressed the networking factor and its impact on the success of new businesses. The researchers highlighted the role of networking and its impact on other factors such as funds and clients. Mian (1996) agreed with the impact of networking by bringing the example of linking incubators with universities, which will support enhancing research output, access to joint-venture research funds, and hiring capabilities to support start-ups projects. Another critical success factor related to the success of incubators is government support. Sun, Ni, and Leung (2007) indicated the critical role of government in supporting the incubator programs as it is mandated to develop their economy and create jobs. The support could be in different forms such as facilitating funds, supporting policies, and networking.

Thus, it was evident that some incubators achieve their goals and therefore, became successful, while others could not do due to different factors and how each incubator is handling those factors. This variation brings a question of why some incubators succeed. As a result, several studies were conducted around the world to address some successful incubators (Hires, 2010). Also, several models can be applied for the incubator to succeed. However, the mechanism of harnessing the associated factors is the key to incubators' success (Dunaj, Narielvala, & Arunov, 2012).

2.10 Criteria for Categorizing the Success Factors of Business Incubation

Although some critical success factors might relate to each other, previous studies showed that business incubators did not agree on specific factors. Smilor (1987) conducted a study to address the mechanisms of operating business incubators. Based on his findings, the researcher identified ten factors for the effective operation of the incubator: i) Access to financing and capitalisation, ii) Community support, iii) Concise program milestones with clear policies and procedures, iv) Entrepreneurial education, v) Entrepreneurial network, vi) In-kind financial support, vii) On-site business expertise, viii) Perception of success, xiv) The selection process for tenants, and x) Tie to a university.

The researcher stressed integrating the factors into each other under the operation to increase the chance of clients' success. Phan, Siegel, and Wright (2005) supported the connectivity of factors, where identified four groups of factors (e.g., incubator, incubatee, entrepreneur, and system) which would give a better understanding of success criteria. Thus, it was noticed that they did not agree on a specific method for categorising the success factors of business incubation; they suggested many elements that lead to success instead.

Verma (2004) conducted a study to identify the success factors of incubators in Canada. Building on Smilor (1987) study, Verma (2004) identified sixty-four variables that may affect the success of the incubators. In order to manage those large amounts of variables, the researcher grouped them into six factors, which are: i) Shared services, ii) Location and facilities, iii) Fund and support, iv) Governance of incubator, v) Criteria of entry and exit the incubator, and vi) Networking and mentoring. On his study conducted in Canada, the researcher distributed the variables among the six factors based on three criteria, which are: i) Characteristics, ii) Literature review, and iii) Definition of a business incubator. Table 3 presents the variables identified by the researcher through literature with their categorisation:

Table 3: Variables influence the incubator's success in Canada

Variables identified through literature	Author(s)
Shared Services	
1. Logistical or Physical Services	Allen (1985)
a. Security services	√
b. Computers	√
c. Conference room	√
d. Custodial services	√
e. Photocopier	√
f. Furniture and equipment rental	√
g. Library	√
h. Telephone equipment	√
2. Shared Business Support Services	Allen (1985)
a. Photocopy	√
b. Receptionist	√
c. Typing	√

Table 3: Variables influence the incubator's success in Canada (Continued)

Variables identified through literature	Author(s)
d. Clerical	√
e. Filing	√
f. Mail service	√
g. Word processing	√
h. Off-hours answering service	√
i. Audio-visual equipment	√
j. Shipping and receiving	√
3. Business Consulting Assistance or Expertise (Financial Consulting)	Allen (1985), Allen and Rahman (1985), and Smilor (1987)
a. Business taxes	√
b. Risk management and insurance	√
c. Government grants and loans	√
d. Government procurement process	√
e. Government contract preparation	√
f. Equity and debt finance arrangements	√
g. Export development assistance	√
4. Business Consulting Assistance or Expertise (Management Assistance)	Allen (1985), Allen and Rahman (1985), and Smilor (1987)
a. Business plan preparation	√
b. Employee relations	√
c. Advertising and marketing	√
d. Health and benefit packages	√
5. Business Consulting Assistance or Expertise (Professional Business Services)	Allen (1985), Allen and Rahman (1985), and Smilor (1987)
a. Legal counseling	√
b. Legal representation	√
c. Patent assistance	√
d. Accounting	√
e. Computing and information	√

Table 3: Variables influence the incubators success in Canada (Continued)

Variables identified through literature	Author(s)
services	
f. Book-keeping	√
g. Introduction to venture capitalist	√
Facilities and Location	
1. Flexibility in size and length of lease	Allen and Rahman (1985), Campbell and Allen (1987), and Parke (1995)
2. City centric location	Young (2001), and Hansen et al. (2000)
Funding and Support	
1. Financing arrangement	Allen (1985), and Allen and Rahman (1985)
2. Organizational arrangement	Allen (1985), and Allen (1988)
Incubator Governance	
1. An experienced incubator manager	Smilor (1987)
2. A key board of directors	Allen (1985), and Smilor (1987)
3. A noted advisory council	Allen (1985), and Smilor (1987)
4. Concise program milestones with clear policies and procedures	Smilor (1987)
Tenant Entry and Exit Criteria	
1. Ability to create jobs	Allen (1985), and Smilor (1987)
2. Present a written business plan	Smilor (1987)
3. Have a unique opportunity	Smilor (1987)
4. Locally owned firm	Allen (1985), and Smilor (1987)
5. Advanced technology related firm	Allen (1985), and Smilor (1987)
6. Space requirements	Allen (1985)
7. Complementary to existing firms	Allen (1985)
8. New start-up firm	Allen (1985), and Smilor (1987)
9. Age of firm	Allen (1985)
10. Affiliated with university	Allen (1985)

Table 3: Variables influence the incubators success in Canada (Continued)

Variables identified through literature	Author(s)
11. Be able to pay operating expenses	Smilor (1987)
12. Time limit on tenancy	Allen (1985), and Smilor (1987)
13. Space requirements	Allen (1985), and Smilor (1987)
Mentoring and Networking	
1. Entrepreneurial network	Smilor (1987)
2. Entrepreneurial education	√
3. Tie to a university	√
4. Community support	√
5. Affiliation with key institution, both public and private	√
Age of Incubator	Allen and McCluskey (1990)
Size of Incubator	Allen and McCluskey (1990)

Looking into success factors from a macro level, Sun, Ni, and Leung (2007) suggested a more holistic approach for categorising the success factors of incubators, the researchers suggested a theoretical framework which categorises the factors to evaluate the incubators and science parks in Hong Kong. The researchers distributed the factors into three groups; related environmental factors (external constraints), incubator related factors (internal process factors), and incubatee related factors (characteristics of clients/entrepreneurs).

Previous studies also discussed the critical factors from the perspective of incubation effectiveness. Lee and Osteryoung (2004) proposed fourteen factors that seem to be critical for incubators to be effective. The researchers classified them into four groups:

i] The strategy of the incubator.

ii] Resources of the incubator.

iii] Business services of the incubator.

iv] Networking services of the incubator.

Other similar studies (Voisey, Gornall, Jones, & Thomas, 2006) also developed some criteria that categorised the successful operation of incubators into five dimensions:

i] Developing clear measurements for the success of incubators' clients.

ii] Capacity to offer entrepreneurial leadership.

iii] Capacity to offer needed services.

iv] Developing sensible selection criteria.

v] Capacity to access needed resources.

Finally, in a case study conducted on technology incubation in Hong Kong, Sun, Ni, and Leung (2007) categorised the success factors into environmental related such as government commitment, incubator related such as service and support offered, and incubate related such as the background of entrepreneurs.

2.11 Measures of Business Incubation's Success

As the factors for incubations' success varies from one incubator to another, the same applies to measures of incubators' success. While some scholars discussed measures of incubator' success based on the growth of their clients (Lalkaka, 1996), others argued that measures of success should be based on the incubators' objectives (Campbell & Allen, 1987). Therefore, the measurement of incubators' success is a complex process that cannot be unified due to the disagreement of evaluation criteria by scholars. Also, due to the evolution of business incubation over the past 30 years, there were no proper best practices to follow. Verma (2005) attributed this complexity due to i) variety of client's needs, ii) variety of incubator goals, and iii) long-term impact of incubators.

The researcher claimed that these challenges make the measurement exercise sometimes intangible, inconsistent, and takes a long time to measure. However, at the

same time, Verma (2005) advocated for developing a framework for assessing the impacts of incubators. The researcher supported updating the measurement of success from incubator perspective (such as having clients and jobs created) to impact perspective (such as the type of jobs created, the growth of graduated clients, and financial performance).

Several scholars measured the success of the incubators by its ability to graduate their entrepreneurs from incubation and sustain them in the outside market independently (Voisey, Gornall, Jones, & Thomas, 2006 and O'Neal, 2005). In the case of business incubators attached to universities, success is measured through revenues generated from selling intellectual property licenses, as well as commercialised technologies (Rothaermel & Thursby, 2005). Also, Hackett & Dilts (2004) measured the success of business incubation by its outcomes with the following possibilities:

- The graduated enterprises that are making a profit and sustained in the market.
- The graduated enterprise that are growing toward profitability.
- The graduated enterprise that are surviving but not growing.
- The graduated enterprise that are closing with minimal financial losses.
- The graduated enterprise that are closing with considerable financial losses.

Though the first two outcomes are considered true success, the last three outcomes might be considered a successful experience. However, it is clear why business incubators are established, while the requirements of success by each incubator is a complex issue. Lish (2012) argued that the success of one type of incubator might be interpreted differently than another, and the stakeholders of the business incubator are the ones who should determine the definition of success. In this regard, Lish (2012)

brought three different stakeholders of a business incubator as examples and presented their point of view of how they perceive success, which are:

- University incubators; success is defined based on generating revenues from commercialising developed technologies and licenses.
- Public incubators; success is defined based on the number of jobs created and develop local economies.
- Profit incubators; success is defined based on some companies created.

Also, due to challenges of unifying the unit of analysis for measuring the success of incubators, sponsors of different types of incubators managed to develop some governance aspects as guidelines to assure the effectiveness of their incubators such as economic efficiency and optimisation of resources incubators (Allen and McCluskey, 1990). Although the variables of incubators' success are still under argument and impacts may occur in a long period, Allen and McCluskey (1990) advocated for two main measures as a unit of analysis for incubators success: creating jobs and clients' graduation from incubator as a reflection of success. Other researchers also suggested some measures through the effectiveness of incubators.

Campbell (1988) presented four significant features of effective business incubators, which are: i) Efficient operation of a business incubator, ii) Quality management of business incubator, iii) The growth of incubators' clients, and iv) Development of incubators’ services. On another hand, looking into the measures of success from the industry perspective, the National Business Incubation Association (NBIA, 1985), presented three significant measures for evaluating the success of incubators; their success measures are based on some creating jobs, clients served, and entities graduated from the incubator.

2.12 Business Incubation in the GCC

The first research objective of this study seeks to review and analyse the literature conducted on business incubators with a particular focus on the GCC region and UAE domain in specific. Thus, a secondary data collection exercise was conducted using academic as well as professional sources. As a result, when collecting all the studies addressing business incubation research within GCC region, the search results identified 28 relevant studies, which was conducted by scholars from the region and abroad, while nine of them have addressed the UAE case (see Appendix II).

The GCC studies conducted on business incubation showed that the youth segment at GCC countries is going to be increased within the population, which needs to counsel to pursue an alternative career away from the government such as entrepreneurship activities (Allam & Alfaki, 2013; Allam & Al-Roubaie, 2012). Also, scholars in the GCC region have tried to cope with innovation and entrepreneurship studies; Allam and Al-Roubaie (2012) investigated the innovation importance for building a knowledge-based economy in the Muslim world. In the entrepreneurship dimension, researchers have highlighted the accumulation of knowledge creation through directed R&D, which turned to commercialised outcomes.

The researchers suggested several elements for an effective innovation strategy in Muslim countries, such as:

i] Developing suitable human skills able to conduct R&D and empower them to develop innovative practices, manage innovation stakeholders, and incorporate external knowledge into local knowledge system.

ii] Building capacity within SMEs related to technologies that are innovation-based, which are feasible economically and led by research institutions

iii] Building an infrastructure to accommodate all innovation stakeholders for facilitating innovation activities and supporting incubators' conducive policies.

Some researchers investigated the reasons behind transition to innovation economy in the GCC states, Jaruzelski et al. (2013) claimed that GCC countries need to shift toward innovation-based economy because of three emerging pressures:

i] Economic Diversification; Countries in GCC understand that depending on hydrocarbon income and its price fluctuation, will not sustain their future economic growth; therefore, they have to secure other sources of income in order to be competitive in the global market.

ii] Demographics and the Engagement of Youth; the increase of youth population in GCC countries need to be addressed, which requires to secure future jobs.

iii] Globalisation; foreign direct investment will move globally toward countries that adopt innovation systems that beyond essential economic incentives.

Jaruzelski et al. (2013) recommended building a practical model for an innovation system in GCC countries that integrates all the efforts and supported by policies that promote innovation toward national innovation agenda. Based on successful approaches of South Korea and Singapore, the researchers suggested for GCC countries to adopt the following stages to create an innovation-led economy:

- Building qualified human capital and allocated investment.
- Develop systematic sources for generating ideas such as incubators.
- Partnerships with different innovation stakeholders under one system.

Thus, based on the related GCC studies, and due to socio-economic challenges, it was noticed that the incubation initiative was suggested as one of the tools to embrace innovation practices in general and support entrepreneurs in particular.

2.12.1 The Evolution of Business Incubation in the GCC

In knowledge-based countries, business incubators are considered a capable platform for developing their economies, which led to innovation emergence, both as practices and as a culture. In GCC countries, numerous efforts took place to launch and operate different types of business incubators in order to catch up with successful cases in the USA, Europe, and the Far East. In this regard, Al-Mubaraki and Schröl (2011) identified 21 business incubators across GCC countries. Among those, the researchers interviewed five of them in order to investigate their role and contribution towards economy, entrepreneurs and transferring technologies.

On the other hand, changes in market conditions and accelerated technologies required entrepreneurial ventures to adapt and cope with the change by looking for alternative approaches to enter and sustain in the market. In GCC countries in general and Saudi Arabia in particular, entrepreneurs faced numerous challenges to grow such as technical assistance, limited support services, and access to the market (Khorsheed, Alhargan, & Qasim, 2012). Thus, different incubators were established in Saudi Arabia in order to overcome these challenges and support potential entrepreneurs. The researchers summarised the existed business incubators in Saudi Arabia in Table 4.

Table 4: Business incubators in the Kingdom of Saudi Arabia

Organisation	Affiliation	Location	Industry Focus	Status of Incubator
Dhahran Techno Valley	KFUPM	Dhahran	Petroleum, ICT	Operational
Riyadh Techno Valley	King Saud University	Riyadh	ICT	Operational
Jeddah BioCity	King Abdul-Aziz University	Jeddah	Biotechnology	Concept
Riyadh Hi-Tech Park Incubator	Public Pension Agency	Riyadh	ICT	Concept

Table 4: Business incubators in the Kingdom of Saudi Arabia (Continued)

Organisation	Affiliation	Location	Industry Focus	Status of Incubator
King Abdul-Aziz and His Companions Foundation for the Gifted (MAWHIBA)	Foundation	Riyadh	-	Operational
Jeddah Chamber of Commerce moreover, Industry (JCCI) Industrial Incubator	JCCI	Jeddah	-	Concept
JCCI Office Incubator	JCCI	Jeddah	-	Operational
Riyadh Chamber of Commerce and Industry (RCCI)	RCCI	Riyadh	-	Operational
BADIR-ICT	KACST	National	ICT	Operational
BADIR-Biotech	KACST	National	Biotechnology	Operational
BADIR-Manufacturing	KACST	National	Manufacturing	Operational
BADIR-Energy	KACST	National	Energy	Concept
BADIR-Nanotech	KACST	National	Nanotechnology	Concept

To realise also the Saudi Arabia vision 2030, the online search revealed three new business incubators that were recently entered the market and introduced to potential entrepreneurs. The three business incubators are:

i) *Wadi Makkah* conducts accelerator programs and focusing on the technology sector. Incubator is targeting start-ups at different stages of their maturity.

ii) *9/10th* seeks to leverage early stage entrepreneurial ventures and take them to mature start-ups. The incubator is launched in partnership with KAUST and focuses on introducing technology to different industries such as media, finance, and food.

iii) *Flat6Labs Jeddah* focuses on conducting acceleration programs aiming to invest in some potential entrepreneurial ideas that have scalability opportunities.

Thus, although few scholars studied business incubation in GCC countries in the past two years, they covered essential aspects such as incubators' objectives, operating models, and their effectiveness. Being one of the most active researchers in the business incubation field in the GCC, Al-Mubaraki and Busler (2010) conducted a study to guide GCC countries for the effective establishment of business incubators. The researchers noted that the concept of business incubation is increasing across the GCC. In the case of Bahrain, a business incubation centre was established through collaboration between the Bahrain Development Bank and the United National Industrial Development Organization to fund new entrepreneurial enterprises aiming to support them with common services related to marketing, legal, and administrations.

Regarding the case of Sultanate of Oman, Khorsheed, Al-Fawzan, and Al-Hargan (2014) noticed that entrepreneurs have challenges in entrepreneurial skills as well as awareness of potential business opportunities, while in Qatar, the researchers revealed that Qatar Foundation is playing a key role in developing the awareness and education aspect in relation to developing local entrepreneurs through the incubation arm under Qatar Science & Technology Park (QSTP), and surrounded by international technology-related companies.

In Saudi Arabia, business incubation practices are more advanced compared to other countries in the GCC. For instance, King Abdul-Aziz City for Science and Technology (KACST) faced the challenges of limited participation in entrepreneurial ventures. As a result of examining the problem, KACST developed a motivating national policy to

encourage potential entrepreneurs to participate in a supportive entity (Khorsheed, Al-Fawzan, & Al-Hargan, 2014). This policy led to establishing BADIR-ICT incubator under KACST.

In terms of the type of incubators within Saudi Arabia, Salem (2014) showed that the most accepted type of incubators is the one attached to universities. Those incubators were capable of developing promising entrepreneurs and supporting them with necessary services starting from office spaces to marketing their businesses after graduation (Salem, 2014). Also, Alsheikh (2009) conducted a comprehensive study justifying the need for business incubation in Saudi Arabia. The researcher claimed that the SMEs in KSA struggled with lack of fund, conducive legislation, and market support, which encouraged the government to establish incubators across the country.

In addition, Hedner et al. (2010) investigated the emergence of incubators to develop entrepreneurial ventures in Saudi Arabia. Despite the increasing support in establishing incubators as well as the existence of success cases of graduated entrepreneurs, the researchers indicated that there is still more room for improving the incubators, mainly in knowledge sharing. In this regard, Khorsheed, Alhargan, and Qasim (2012) investigated the case of establishing “BADIR” as one of the first national technology incubators in Saudi Arabia.

BADIR was formed in 2006 as part of the country's mission toward transforming into a knowledge-based economy and accelerate the growth of technological start-ups. BADIR is registered as a non-profit and independent entity located in King Abdul-Aziz City for Science and Technology (KACST) but under its governance. BADIR focuses on the ICT-related industries. It was mandated to support ICT related companies through collaboration with Saudi Telecom Company (Khorsheed,

Alhargan, & Qasim, 2012). BADIR incubator consists of two divisions; a non-profit management section, which looks after mentoring services, networking, funding, and monitor program performance. The second section is the for-profit venture fund, which focuses on clients of incubators.

2.12.2 The Roles of Business Incubation in the GCC

In the GCC context, scholars indicated that local economies could be developed through incubators as it is a viable mechanism for developing new emerging technologies and small businesses (EL-Midany & Shalaby, 2009). Al Mubaraki and Busler (2012a) conducted extensive studies covering different aspects of business incubation; the researchers recommended developing guidelines for applying best practices in establishing incubators in the GCC. In another study, Al Mubaraki and Busler (2010b) showed the importance of incubators in the survival of new start-ups, which will positively affect their local economies.

The researchers claimed that by applying the best practices model, new companies might increase the survival rate to 90% and therefore, sustain in the market. Also, Al Mubaraki and Busler (2012a) highlighted the benefits of incubators in transferring technologies as well as creating jobs. Furthermore, Al Mubaraki and Busler (2012b) highlighted four strategic outcomes expected from business incubators: i) building entrepreneurial culture, ii) commercialising technologies, iii) creating jobs, and iv) diversify of local economy.

Some scholars studied the role of business incubators within GCC in comparison to their outcomes in Europe based on their management approaches. Hedner et al. (2010) investigated the impact of business incubators at five countries within GCC; the scholars highlighted five cases of business incubators within GCC as following:

i] *The Kingdom of Bahrain***:** Through a joint-venture initiative between Bahrain Development Bank and United Nation Industrial Development Organization (UNIDO), the incubation centre was formed in 2003 focusing on commercialising research, create companies, and raise entrepreneurial culture. The centre managed to occupy 35 new entities with 265 employees.

ii] *The Kingdom of Saudi Arabia***:** Through King Abdul-Aziz City for Science and Technology (KACST), BADIR incubator was established in 2008 to support ICT-related start-ups.

iii] *State of Qatar***:** Established in 2008, Qatar Science and Technology Park was developed to develop profitable ventures and create jobs through commercialising research, as well as promote entrepreneurship culture. The Park was also established to support the ICT industry.

iv] *The United Arab Emirates*: Created Dubai Business Incubation Centre (which turned later to Hamdan Innovation Incubator) by the government to accelerate the development of local and GCC entrepreneurs aiming to create successful start-ups through existed resources and facilitates within the incubator.

v] *Sultanate of Oman*: through a joint venture initiative with UK technology park programs, the Sultanate established a business incubation program focusing on finance, business information, and transferring technologies.

Based on the analysis of above case studies, the researchers summarised the role of business incubators in i) Development of the local economy, ii) Transfer of technologies, iii) Establish new start-ups, and iv) Create new jobs. Being as the largest economy within the GCC, some researchers conducted an in-depth case study in Saudi Arabia. In recent years, the government of Saudi Arabia set a target for its economy transition into a knowledge-based economy. This entailed building an ecosystem for

entrepreneurs to grow and sustain (Khorsheed, Al-Fawzan, & Al-Hargan, 2014). Alsheikh (2009), supported this view and emphasised on the critical role of incubators in meeting new market trends, developing technical capabilities, creating local customised products, and therefore, support industrial sectors, which also results in creating local jobs.

Salem (2014) had the same view in terms of incubators' contribution to Saudi Arabia. The researcher claimed that incubators facilitate realising economic growth by enabling entrepreneurs to enhance their competencies to enhance their products and service, and therefore, access the market and gaining market share. Moreover, having most of the incubators attached to universities in Saudi Arabia, Salem (2014) highlighted the critical role of universities in developing entrepreneurial skills and knowledge that enables them for developing their entrepreneurial ventures, which is another way of enhancing recruitment opportunities.

Investigating the case of BADIR incubator in Saudi Arabia, Khorsheed, Al-Fawzan, and Al-Hargan (2014) showed that the incubator managed to grow ICT related businesses and sustain them in an open market. As a result, BADIR incubator managed to serve three other industries: ICT, biotechnology, and advanced manufacturing. Furthermore, being as the first incubator program across the country, BADIR was also requested to support other national technology incubators as well as supporting male and female potential entrepreneurs through training and research programs.

2.12.3 Success Factors of Business Incubation in the GCC

When evaluating the performance of business incubators in the region, researchers noticed almost similar ingredients for success. According to Khorsheed, Al-Fawzan, and Al-Hargan (2014), incubators faced several external and internal challenges in

supporting entrepreneurial ventures in Saudi Arabia. On the other hand, it was noticed that entrepreneurs themselves are challenged by lack of management skills, access to the market, and risk capital. As a result, KACST developed a national policy that supports potential entrepreneurs to enable them for joining BADIR incubator and become their client (Khorsheed, Al-Fawzan, & Al-Hargan, 2014). Also, Riyadh Techno Valley Park (RTV) has been established with the vision of "leadership in R&D and technology transfer", aiming for transforming the country as a hub for the entrepreneurial cluster (Alshumaimri, Aldridge, & Audretsch, 2010).

Although business incubators are created to support young start-ups seeking to sustain their businesses, Al-Mubaraki & Busler (2010) claimed that each developing country like in GCC region needs guidance to develop business incubators. The researchers stressed several factors that need to be considered when evaluating the effectiveness of incubators, which are the followings:

- An adequate level of value-added services that support the desired fields.
- Markets for the incubators to develop potential investment-focused businesses.
- The availability of business clusters that is networked and interrelated.

Al-Mubaraki and Busler (2010) also recommended embracing an incubator model that is suitable to GCC economic requirements through the following initiatives:

Incubating systems that combine academic and industrial entities.

- Open incubators that serve their clients rather than centralised location and supported by expertise.
- Concept incubators that promote new products and services through initial ideas to be developed and prototyped.

- International trade incubators that support small emerging teams, aiming to establish international businesses.

Moreover, in order to help the stakeholders of incubators in the GCC for successful implementation, Al-Mubaraki and Schröl (2011) evaluated some incubators to measure their effectiveness, while Al-Mubaraki and Busler (2015) identified the strengths and weaknesses of incubators through case studies in GCC. The researchers measured their effectiveness through four indicators: i) graduation from incubators, ii) success of incubatees, iii) creation of jobs by incubators, and iv) wages paid by incubated clients. These indicators were aligned with the indicators proposed by Mian (1996) and Lalkaka and Bishop (1996).

Also, in his comparison study conducted between Jordan and the UAE, Elmansori (2014) conducted a comparative study concerned with variables as critical factors affecting the incubators' success; about seven factors were identified, these were:

i] Objectives of establishing business incubations and its targeted sector.

ii] Government and private sectors' support.

iii] Funding for new ventures.

iv] Basic/value added/specialised services provided for the clients.

v] Business incubation structure and governance.

vi] Funding for business incubations.

Finally, Alsheikh (2009) conducted a study on business incubation and economic development in Saudi Arabia investigating different aspects of business incubation and its practices in the context of Saudi Arabia. Based on his qualitative methods, the researcher studied eighteen success factors that contributed to the ideal business incubators as:

1] Accessibility to funding.

2] Commercialisation of university applied research.

3] Conducive government policy for developing businesses

4] Education linkages and business.

5] Effective entrance and exit process.

6] Encouraging policy for employment creation

7] Enterprise culture.

8] Entrepreneurial education.

9] Entrepreneurial education at academia.

10] Entrepreneurship culture.

11] Experienced management teams.

12] Focused curriculum of enterprise and educational experiences.

13] Intellectual property rights.

14] Internships of undergraduates.

15] Links of business academics.

16] Location and objectives of the incubator.

17] Marketing and commercialisation of incubator.

18] Relationship and networking of the incubator.

Thus, although the studies of success factors of a business incubator in GCC were very limited, their results revealed to extend similar findings in terms of the success factors with other international respective studies. As such, a summary of success factors and roles of business incubators were developed based on the 28 studies conducted in business incubators within GCC domain (see Appendix III).

2.12.4 Categorizing the Success Factors of Business Incubation in the GCC

Scholars worldwide used different methods for categorising the success factors of incubators. In this study, the researcher categorised the factors based on the source of impact in tow groups, these are:

i] The factors that was within the control of incubator management were categorised as internal factors (competent management team, policies, networking, funding, commercialisation, goals, and intellectual property rights).

ii] The factors that were beyond the control of incubator were categorised as external factors (entrepreneurship culture, education for entrepreneurship, academia and entrepreneurship education, culture of enterprise, enterprise-focused curriculum, business and education linkages, internships, policy environment for employment creation, academic business links, commercialization of university-driven research, and government policy).

In the GCC context, very few scholars discussed categorising the factors. Alsheikh (2009) classified the success factors into external factors (such as market condition and government support) and internal factors (e.g., networking and infrastructure). Once the researcher distributed the factors into those two groups, the unit of comparison were developed for each variable to validate the results of the performance measure. Also, Obeidat and Abu-Shanab (2010) used the same approach of Alsheikh (2009) in categorising the factors (independent variables) that influence the success of incubators, which was based on ‘'control" aspect in order to divide the factors into either internal or external factors.

2.13 Business Incubation and Entrepreneurship in the UAE

Scholars showed that the incubator initiative is considered a useful tool for developing economies. In the UAE context, studies conducted on the evolution and objectives of incubators were very limited. In the following sections, the evolution of incubation initiative will be discussed followed by an overview of entrepreneurship status in the UAE.

2.13.1 The Evolution of Business Incubation in the UAE

Few researchers examined the success factors of incubators as well as its role in promoting entrepreneurship practices in the UAE. According to Hamad & Arthur (2012), the first business incubator was launched in 2002 through Mohammed Bin Rashid Establishment for SMEs Development (has been changed to become Hamdan Innovation Incubator). Using a qualitative approach through interview method, Al-Mubaraki et al. (2010) interviewed five incubators out of 21 existed ones within GCC countries including UAE. Their results showed that incubators are expected to contribute in promoting technology transfer, creating jobs, support establishing new enterprises, and therefore, contributing to socio-economic development plans. In the case of the UAE, the researchers highlighted the establishment of Dubai Business Incubation Centre and its role in supporting technology and ICT ventures. The support ranged from physical infrastructure to training of entrepreneurs and access to funding.

In terms of the outcomes of incubators within UAE context and its relationship with entrepreneurship success, Elmansori (2014) investigated the impact of business incubators on developing businesses in Jordan and UAE, particularly their contribution to i) Developing the local economy, ii) Strengthening innovation and entrepreneurship, iii) Promoting technology-based products, and iv) Supporting the national innovation

system. His results showed that incubators act as an essential tool for promoting and leveraging entrepreneurship in the UAE as well as in Jordan. The researcher claimed that the incubators are considered a good enabler for entrepreneurs to accelerate and sustain their businesses as well as crucial for national innovation system.

Hamad and Arthur (2012) agreed with this view; their study found that incubators are created to support technology entrepreneurs and accelerate their entrepreneurial businesses. Elmansori (2014) also investigated the type of incubators operated, their financial model, and their target sectors in the UAE. The researcher studied the case of the incubator unit at Mohammed Bin Rashid Establishment for SMEs Development. Also, concerning the targeted sector by the existed incubators, the researcher noticed that 80% of incubators are serving technology-related fields, while their operating model depends on 50% of government fund and expected to be supported by the private sector for the remaining fund (Elmansori, 2014).

Moreover, new applicants for accessing business incubators were assessed by managers of business incubators or through their committee, while the acceptance of entrepreneurs is based on the novelty of business, maturity of idea level, market size, and competitive advantage of the business (Elmansori, 2014). Furthermore, the researcher highlighted the services that are provided by business incubators in the UAE to their clients, which are: i) Technical support for technology and manufacturing projects, ii) Training programs, iii) Legal services and IP management, iv) Marketing and networking, v) Accounting and financial management services, and vi) Facilitating international trade assistance (import and export).

Finally, Elmansori (2014) highlighted the limited impact of business incubators in the UAE collectively due to their small number compared to other developed countries.

The researcher presented the performance indicators of the incubation unit at Mohammed Bin Rashid Establishment for SMEs Development, in comparison with business incubators in Jordan between 2010 and 2011 as shown in Table 5.

Table 5: Development and performance of the incubators in UAE and Jordan

Statement	Jordan	UAE
Current Business	38	60
Business Graduated	22	17
Jobs Created	648	216
Patents registered	4	2
Copyright registered	9	3

Another related study conducted within UAE domain was about the prospects of business incubators and its role in developing new enterprises; Madichie (2010) investigated the implementation of business incubation in the UAE based on previous western experiences. The researcher demonstrated eight entities that showed the relevant function of business incubation in the UAE in which they support entrepreneurial ventures; these include:

i] *Centre of Excellence for Applied Research and Training* (CERT): Established in 1996 to adopt entrepreneurial initiatives by developing the latest technologies and supported by international technology-related partners.

ii] *Knowledge Village (KV)*: Established for developing a pool of talents to accelerate and support the knowledge economy. KV built a large community of business and academic partners to collaborate and develop knowledge related programmes.

iii] *Dubai Internet City (DIC-1):* Established in 2000 to support ICT businesses through the robust ICT infrastructure in the region. DIC targets ICT companies in order to help them to enter markets in the region.

iv] *Dubai Media City* (DMC): established in 2001 focusing on the media and communication sector. DMC helps companies to leverage their skills and capabilities in order to commercialise their products and services.

v] *Technology Park* (Techno Park): Established in 2002 to attract the research investment in the field of energy, water, and environment. Techno Park is mandated to transfer technologies in partnership with academic and international companies.

vi] *Dubai Biotechnology & Research Park* (DuBiotech): Established in 2010 to support the knowledge economy. DuBiotech provides spaces for international and local biotechnology companies.

vii] *Dubai Industrial City* (DIC-2): Established as a cluster for manufacturing facilities focused on developing the manufacturing sector. DIC-2 provides value-added services including vocational training and logistic services.

viii] *Dubai Silicon Oasis* (DSO): Established to support high-tech industries such as microelectronics and semiconductor fields. DSO provides innovation centre to develop this industry through research and development.

Madichie (2010) concluded that the infrastructure and facilities provided by academia as well as the professional industries in the UAE are suitable for business incubators to succeed. Also, the researcher emphasised academic-industry partnerships that can leverage the success of entrepreneurial ventures. Concerning the performance of business incubators within the UAE context, Al-Mubaraki and Schröl (2011)

developed a proposed model for measuring the effectiveness of business incubators in the GCC countries.

Although there is no common agreed approach by scholars as well as by industry professionals to measure the performance of business incubators, the researchers proposed four critical factors to measure the effectiveness of incubators, which are:

- Some graduated entrepreneurs from business incubators.
- The success of incubated businesses.
- Some jobs created by business incubators
- Salaries paid by incubated start-ups.

These measures were built based on case study analysis, literature reviews, and discussion with industry experts (Al-Mubaraki & Schröl, 2011). However, the researchers recommended conducting further research in this area over some time to track the performance of business incubators and evaluate their outcomes in those four factors. In this regard, Elmansori (2014) summarised the following points for incubators' effectiveness:

- Prepare a comprehensive business plan for establishing a business incubator.
- Measure the success of incubators based on the success of incubated clients.
- Providing marketing, consultation, financial, and logistic services.
- Incubate the selected projects between 18 to 36 months.
- Build the business incubation model among their stakeholders.
- Diversify the source of donations for business incubators.
- Business incubators should be governed by their key stakeholders
- Business incubation managers should have an entrepreneurial background.
- The services provided should be tailored to clients' needs.

Thus, by addressing the previous studies internationally as well as within the region in the field of business incubation, it is expected that the stakeholders of business incubators will gain a better understanding in terms of having guidelines of establishing and operating business incubators effectively in the country (Elmansori, 2014). Previous studies examined and identified several measurable impacts of successful business incubators and its critical importance (Alsheikh, 2009; OECD, 1997a; Almansor, 2014; O'Neal, 2005; and Smilor, 1987). Thus, it is noticed that the impact and benefits of establishing business incubators in the UAE do not vary from another part of the world. UAE showed recently extensive efforts to support entrepreneurs as well as the stakeholders of business incubators (Byat & Sultan, 2014).

2.13.2 The Status of Entrepreneurship in the UAE

The UAE launched their vision 2021 aiming to position the country among the top advanced countries. Embracing a knowledge-based economy to sustain its economic growth was one of the priorities declared in the vision. In order to realise UAE vision 2021, the UAE government encouraged UAE nationals to pursue entrepreneurial activities as an alternative career opportunity. In this regard, extensive efforts for supporting entrepreneurship practices has taken place by the UAE federal and local governments in the last five years (Byat & Sultan, 2014). The support included financial, training, and legislation that encouraged entrepreneurship practices among UAE. Also, several government programs have been initiated to support and particularly provide funds for SMEs across local Emirates in the UAE such as Khalifah Fund, Mohammed Bin Rashid for SME Development, and Ruwad, which played a considerable role to increase the number of SMEs in the market.

Concerning literature conducted on entrepreneurs in the UAE, scholars around the world have agreed that SMEs and entrepreneurs are one of the main tools for developing economies. However, the changes in the global economy, the speed of innovation, and the advancement of technologies have urged the countries within GCC to improve their entrepreneurial practices (Salem, 2014). In the UAE, Van Horne & Al Awad, 2011). The researchers conducted industry entrepreneurship report to measure the entrepreneurial activities based on adult population survey (APS). The report revealed interesting results concerning the entrepreneurial environment, performance, and outcomes, which are summarised in the following points:

i] The intention rates to start entrepreneurial ventures ranked very low with only two university graduates out of 100 are motivated to start their businesses.

ii] The low percentage of women entrepreneurs due to socio-cultural constraints related to their stability, security, and skill gaps.

iii] The high percentage of discontinuing entrepreneurial businesses among the UAE Nationals due to market forces, unprofitable businesses, and personal reasons.

Van Horne and Al Awad (2011) characterised the economy of the UAE as open to opportunities, readiness to new products and services, and arrange financial resources. Thus, the researchers assumed that the business environment is open to building an entrepreneurial ecosystem in order to support the local economy and accelerate entrepreneurial practices.

Looking into entrepreneurship status of the UAE within international indexes, the Global Entrepreneurship Monitor Report (GEM) showed that the UAE scored 75.1% in terms of pursuing entrepreneurship as a career choice, which is quite a good

indicator comparing to some advanced countries such as Singapore (51.7%) and Canada (65.5%). However, the report showed that only 5.7% of the adult population is currently involved in entrepreneurial businesses, which is relatively low comparing to comparable countries.

With regards to job creation by entrepreneurial businesses, the report showed that 67.3% of businesses managed to create more than six jobs on average, however, since 2009, 40% of entrepreneurial businesses did not offer innovative products or services. This was aligned with the results of Erogul and Horne, (2014), the researchers revealed that the activities of Emirati entrepreneurs are focused on consumer and service-oriented businesses and using technologies but not developing it. This indicates that the UAE entrepreneurs need to expand their businesses to include more novel ideas in those seven sectors. Finally, as far as gender perspective, it was noticed that male entrepreneurs were dominating with a percentage of 80%. This is attributed to some cultural constraints as well as the limited female number of entrepreneurs to access the market.

Therefore, the results showed that more efforts need to be done for integrating entrepreneurship activities in those seven targeted sectors. The current entrepreneurial support entities need to be geared towards supporting and sustaining entrepreneurial businesses. In this regard, Madichie (2010) have shown that the Emirate of Dubai has many entities that expected to support entrepreneurship activities, such as Dubai Biotechnology and Dubai Internet City, however, these entities, in fact, turned to play the role of real-estate business and were not systematically connected with Universities, neither produced considerable entrepreneurial ventures that succeeded and sustained in the market. Moreover, Yahya, Pervan and Xu, (2013) have

investigated the characteristics of SMEs in Dubai, UAE. Their findings were aligned with the GEM report, which indicated that the performance of SMEs is not highly driven by innovation practices. This is quite surprising mainly for the country as Allam and Alfaki (2013) have indicated that UAE ranked 32 out of 142 countries in terms of the capacity of its companies and people to create and then commercialise new products and processes.

Therefore, although the growth of entrepreneurship activities has been increased, there are more efforts that needs to be done for incorporating the entrepreneurship with innovation aspect in which could support different industries. This link is very critical for the transition of the UAE to a knowledge-based economy (Van Horne & Al Awad, 2011). In order to face this challenge, Al-Abd, Mezher, and Al-Saleh (2012, July) have suggested offering incentives for UAE nationals to create their entrepreneurship projects, while Allam and Al-Roubaie (2012) brought the example of Finnish Funding Agency for Technology and Innovation to be benchmarked, the researchers showed the role of Finnish Funding Agency in managing new entrepreneurship ideas, whereas the Academy of Finland takes the responsibility of managing R&D activities.

As far as incubators' roles in supporting entrepreneurship practices in the UAE are concerned, it was noticed that few incubators have been established either by the private sector (such as Krypto Labs), by the government (such as Hamdan Innovation Incubator), and by universities (such as StartAD) to promote entrepreneurship practices in general and helping to create successful business in particular. These incubators were established as a reflection of government intentions for enhancing the opportunities of potential entrepreneurs to develop their entrepreneurial projects,

increasing the SMEs in the market, and develop entrepreneurship culture in the country.

Thus, the UAE recently showed some good improvements in entrepreneurial-related indexes and took some initiatives toward supporting entrepreneurs. Also, the entrepreneurship ecosystem in the UAE seems to be improving by combining the efforts over the last few years. In terms of the nature of start-up businesses, e-commerce and software are dominating the major businesses, which directly related to consumers (Business to customers), and mainly located in Dubai. However, more attention needs to be given for educating entrepreneurs and allocating mechanism for integrating entrepreneurial businesses into targeted industries.

2.14 Conclusion

The literature review chapter discussed the concept of business incubation and provided a good background about its inspection as well as its definition from different stakeholders' perspective. The chapter has also discussed the services that business incubators usually offers, the factors affecting their success and how to measure them, and the roles of business incubators.

Researchers and industry practitioners presented various definitions of business incubation based on specific criteria such as the type of their sponsors. For this study, business incubation is defined as an economic platform created for entrepreneurs to develop their entrepreneurial businesses by providing them with value-added services in order to commercialise and sustain their projects in the open market. Also, this chapter discussed some differences of incubators than similar initiatives such as technology parks and acceleration programs, particularly in the targeted clients (entrepreneurs), services offered, the duration of providing support.

The literature also discussed some theories applied to business incubation, which helped to explain certain phenomena through the systematised structure. As far as the roles expected from the incubators, the studies revealed that they might play critical roles at the micro levels such as nurturing entrepreneurs. In the same time, they can play some strategic roles at macro level such as supporting entrepreneurship culture and develop local economies. However, those roles need to be investigated on the UAE domain to understand to what extent the local incubators are playing those roles.

In terms of incubators' success factors, international scholars as well as from the region suggested a range of factors that may have an influence on incubators' success as well as criteria for categorising those factors. Those factors were either beyond the capacity of the incubators such as the level of collaboration with incubators, while some others were within their control such as the experiences and qualifications of incubation management. However, scholars did not agree on a specific categorisation of success factors due to different objectives of the incubators. With regards to measuring the success of the incubators, scholars did not agree on a specific set of measures, mainly due to different types and sponsors of incubators. However, success measures such as creating start-ups, graduating entrepreneurs from incubators, and creating jobs were proposed by a variety of local and international scholars as well as industry professionals.

Finally, the previous GCC related studies have shown the critical need for business incubation initiatives due to their socio-economic benefits. In this regard, this study seeks to determine the success factors of incubators and examine their current roles in the UAE. Since the studies of Al-Mubaraki and Schröl (2011) and Elmansori (2014), there has not been any research covering those two dimensions within the UAE

domain. Also, those studies covered only one incubator (Mohamed Bin Rashid Establishment for SME development), which was established in 2000.

Therefore, this chapter provided updated knowledge about business incubation practices in general, and their success factors as well as their roles in particular through 28 identified studies. However, some specific success factors were highlighted that might require more investigation about their influence on incubators' performance, which may impact on incubated entrepreneurs' success such as the collaboration level of the incubators with universities and professional industries. Also, due to updated national economic plans and strategies within the GCC countries, the local governments in those countries are expecting that business incubators would serve their strategic plans such as developing local products and services as well as promoting entrepreneurial practices. Therefore, for this study, those success factors and roles are necessary to be investigated within the UAE in order to enhance the utilisation of business incubators in the country.

Chapter 3: Conceptual Business Incubation Framework in the UAE

3.1 Introduction

Business incubation initiative has increasingly been under attention by different countries in general, and recently within the GCC region in particular. The initiative is considered as one of the enablers to attract and develop entrepreneurial ideas to be nurtured and commercialised. On the other hand, sustaining the development of local economies were another reason for the establishment of incubators across the world. Regarding the studies of Sithole and Rugimbana (2014), Smilor (1987), Mian (1997), and Somsuk and Laosirihongthong (2014) developed specific frameworks either for evaluating the success factors of incubators, their impact on incubation performance, or their influence on incubated entrepreneurs' success.

In the case of the UAE, although the county is considered as one of the leading producers of oil in the world, the country faced challenges in developing the growth in non-oil sectors (Fasano & Iqbal, 2003). Thus, some economic tools such as incubators have been introduced to support the growth of local economies, and at the same time reduce the ultimate dependence on oil revenues. Therefore, understanding the enabling factors for business incubators to succeed, as well as examining their roles in the UAE is critical to be investigated. As a result, an overview of the research problem that needs to be addressed was presented in chapter one.

In Chapter 2, a comprehensive review is conducted on business incubation concept, evolution, services, success factors, and impacts. Also, a particular focus allocated on the GCC in general and on the UAE in specific about business incubation practices. In this chapter, the aim is to determine the factors that correlate to the success of business

incubators, their expected roles, and their success measures in the UAE in order to address the research problem and propose recommendations. Therefore, each proposed enabling factor and their expected roles have been justified based on previous studies. As a result, the research hypotheses were proposed to be tested. Accordingly, a conceptual framework of business incubation's success in the UAE is proposed. In the following sections, the components of the framework will be elaborated, discussed, and justified.

3.2 Perception of Business Incubations' Success in the UAE

While business incubators were evolving for the last thirty years, the success of incubators has always been an interesting area for related scholars as well as for industry professionals. Verma (2005) indicated that the measurement of success became complicated due to different objectives set sponsors of incubators. On another hand, according to Blackburne (2014), the evaluation of incubators' success may include many dimensions such as incubators' success, incubatees' success, and sponsors' success. For instance, incubators could be successful from the number of graduated entrepreneurs, while sponsors' success can be in the form of some jobs created, and their contribution to the local economy.

As far as incubatees', it can be measured by some entrepreneurs survived outside the incubators and number of start-ups created. In the case of university-based incubators, Lish (2012) defined success as some technologies and licenses that are commercialised. Nevertheless, the term "success" of the business incubator can be realised between clients' needs (entrepreneurs) and the objectives of incubators' sponsors. Once the success term becomes clear for all incubation stakeholders, it is presumably logic by then to define the measurements of business incubations' success.

Thus, it was necessary to agree on the dimension of success (the incubator and the incubatee) before evaluating the success itself.

Concerning entrepreneurs' graduation from incubators and creating start-ups, Moreira and Carvalho (2012) pointed out that the success of incubation revolves around the proper selection of their clients and the ability to graduate successful small businesses. Some other researchers narrowed the success into the number of entrepreneurial businesses graduating from the incubators (O'Neal, 2005; Allen & Weinberg, 1988), while Lish (2012) considered business incubators are successful when they show outcomes in the form of creating start-ups. Also, the researcher argued that the profitability stage and sustaining the growth is beyond the incubation's effectiveness.

Sithole and Rugimbana (2014) also argued that measuring the success of incubators should be based on the growth of their clients' businesses and their sustainability. The researchers claimed that such a measurement is more favourable for incubators' sponsors. This is quite a legitimate measure especially if the incubators owned by the government, as the government seeks to have successful entrepreneurs sustained in the market and beyond the incubator capacity, which eventually will benefit the community in creating jobs as well as contributing to the local economy.

In the GCC states, when examining the criteria of graduating entrepreneurs, creating start-ups, and sustaining incubated entrepreneurs in the market as a measure of success, the GCC studies revealed that sustaining incubated entrepreneurial ventures in the open market and beyond their incubators is rated as the highest rank among the suggested success criteria. The existing relevant literature revealed that scholarly studies on business incubation indicate that the GCC many scholars were focusing on tangible impact, particularly in increasing the percentage of SMEs in the market that

can introduce local products and services. Table 6 shows the summary of success perceptions based on the 28 business incubation studies conducted in the GCC states.

Table 6: Studies on success perception of business incubation in the GCC

Success Criteria by Business Incubation Studies in the GCC (28 Studies)	Number of Studies Mentioned the Success Criteria	Percentage
Sustaining Incubated Entrepreneurs in the Market	13	46.4%
Creating start-up companies	10	35.7%
Graduating entrepreneurs	9	32.1%

In the UAE case, as the incubation initiatives are considered relatively new to the country. Elmansori (2014) conducted a comparison study between Jordan and UAE concerning entrepreneurship support through existed incubators. The researcher found that incubators are considered successful if they managed to create jobs and support the local economy. Having a couple of incubators that were launched recently by the local and federal governments in the UAE, this indicates that the UAE Government is expecting tangible outcomes out of the establishment of several business incubators in the country.

Therefore, building on the research results of Elmansori (2014), as well as other international scholars in relating the success of business incubators to “outcomes” as criteria, this study will follow the same as success criteria to be evaluated throughout the study. Therefore, business incubation will be successful when they can i) Graduate entrepreneurs from the incubators, ii) Support creating start-up companies, and iii) Support sustaining incubated entrepreneurs in the Market. Thus, this research will define the success of business incubators as an incubator that can graduate

entrepreneurs from the incubator, able to support in creating start-ups and manage to sustain the incubated entrepreneurial businesses in the open market.

3.3 Categorizing the Success of Business Incubation

Scholars suggested different criteria for categorising the success factors of incubators. Some researchers categorised the factors based on the type of incubator, internal or external factors, and the objectives of the incubators. For instance, Lee and Osteryoung (2004) proposed fourteen success factors, which was divided into the physical and soft resources, the incubator services, and the networking activities, While Sun, Ni, & Leung (2007) distributed the success factors based on their relevance to business environment, incubator itself, and clients of the incubator. Similarly, Smilor (1987) presented ten factors distributed between external and internal factors that may influence the operation of business incubators, and therefore, their effectiveness, as per Table 7.

Table 7: Perception of success by business incubation's studies in the GCC

a) Internal Factors:	b) External Factors:
The availability of relevant expertise.	The relationship with universities
The networking between entrepreneurs	The clarity of policies & procedures.
The selection processes	The accessibility to capital
The education programs for entrepreneurs	The in-kind financial support
The perception of success	The community supports

Some other scholars used fundamental theories to identify and categorise the success factors of business incubators. They are known as one of the most key theories in the strategic management field. Somsuk, Wonglimpiyarat, and Laosirihongthong (2012) and Sithole and Rugimbana (2014) argued that the majority of scholars in business

incubation literature had used a resource-based theory as a basis for determining the critical factors. Thus, in their study, the researchers applied the resource-based theory to identify the enabling factors at technology-based incubators in Thailand using Q-sort method to categorise the identified factors.

In the GCC region, although few researchers investigated the categorisation of success factors, those studies suggested similar approaches to categorisation. Alsheikh (2009) and Obeidat and Abu-Shanab (2010) built their categorisation criteria based on the control condition; the factors that are within the control of incubator were considered as internal factors, while the factors that are beyond the control of an incubator, were considered as external factors. Thus, based on the previous studies that discussed the categorisation of incubators' success factors, we can summarise the categorisation criteria as shown in Table 8.

Table 8: Some categorisation criteria for the incubator's success factors

Author(s)	Categorisation criteria
Verma (2004)	▪ Shared services ▪ Facilities and location ▪ Funding and support ▪ Incubator governance ▪ Tenant entry and exit criteria ▪ Mentoring and networking
Smilor (1987)	▪ External factors ▪ Internal factors
Alsheikh (2009)	▪ External factors ▪ Internal factors
Lee and Osteryoung (2004)	▪ Strategy related ▪ The physical and soft resources ▪ Incubator services ▪ Networked services
Obeidat and Abu-Shanab (2010)	▪ External factors ▪ Internal factors

Table 8: Some categorisation criteria for the incubator's success factors (Continued)

Author(s)	Categorisation criteria
Sun and Leung (2007)	▪ Environmental related factors (external constraints), ▪ Incubator related factors (internal process factors), ▪ Incubatee related factors (characteristics of clients/ entrepreneurs)
Voisey et al. (2006)	▪ Developing clear measurements for the success of incubators' clients. ▪ Capacity to offer entrepreneurial leadership ▪ Capacity to offer needed services ▪ Developing sensible selection criteria ▪ Capacity to access needed resources

The summarised table shows that although the criteria of external and internal factors were dominant in some major studies conducted worldwide and in the GCC region, researchers did not agree on standard categorisation criteria for the success factors. The criteria of internal and external aspects were prevailing simply because a substantial number of influencers were beyond the business incubator capacities such as government legislation and the availability of fund. Also, scholars built their categorisation criteria based on different types of stakeholders, which are either internal or external influencers, and might contribute to the success incubators.

Alsheikh (2009) argued that external factors are interlinked that can be grouped under one package such as government support, which may refer to their respective policies, funds allocated, and networking support, and therefore, makes the ordinary duties of business incubators more or less challenging. Thus, based on the above studies, this research adopted the "*control*" aspect as a criterion for distributing the proposed success factors of business incubators in the UAE. The adopted criteria were applied by some authors (e.g., Alsheikh, 2009; Obeidat & Abu-Shanab, 2010; Sun, Ni, & Leung, 2007; Smilor, 1987). So, any proposed factor that has an impact on the success

of business incubator, which is within the control of business incubators in the UAE, will be considered as an internal factor. Alternatively, any proposed factor that has an impact on the success of business incubators, which is beyond the control of incubators in the UAE, will be considered as an external factor.

3.4 The Proposed Success Factors of Business Incubation in the UAE

Scholars around the world extensively discussed the critical factors that may influence the success of business incubators. However, academic researchers, as well as industry professionals, did not agree on a specific set of factors due to different objectives of each type of incubator and their nature of establishment (Verma, 2004; Sun, Ni, & Leung, 2007). Therefore, this study will explore the factors that are specifically related to business incubation's success in the UAE domain. To achieve the research aim, this study reviewed the literature conducted on business incubation worldwide with particular focus on the GCC states and the UAE. The literature reviews, and industry reports conducted around the world, proposed more than sixty factors using different selection criteria. Table 9 summarises the success factors based on some of the global studies conducted on business incubation:

Table 9: Identified success factors in some business incubation works

Author(s)	Success Factors
Lish (2012)	▪ Human resources and Relational resources ▪ Financial and Legal resources ▪ Organizational and physical resources ▪ Fit applications/screening process
Verma (2005)	▪ Logistical or Physical Services ▪ Shared Business Support Services ▪ Funding support, Facilities and Location ▪ Incubator governance ▪ Tenant entry and exit criteria ▪ Mentoring and networking ▪ Age and size of incubator

Table 9: Identified success factors in some business incubation works (Continued)

Author(s)	Success Factors
Hackett and Dilts (2004)	▪ Age of incubator and Expertise perspective ▪ The maturity of the local market
Sun and Leung (2007)	▪ Networking ▪ Government support
Mian (1996)	▪ Ability to link incubators with universities
Smilor (1987)	▪ The availability of relevant expertise. ▪ The accessibility to capital & in-kind financial support ▪ The community support ▪ The networking between entrepreneurs ▪ The education programs for entrepreneurs ▪ The selection processes ▪ The relationship with universities ▪ The clarity of policies and procedures.
Sithole and Rugimbana (2014).	▪ Selection and pre-incubation services ▪ Business support services, ▪ University entrepreneurial networks/mediation, ▪ Financial and organisational resources ▪ Exit strategy, graduation rate, and incubation period.
Somsuk and Laosirihongthong, (2014).	▪ The selection process for tenants ▪ Efficient programmes with clear policies and procedures ▪ Mutual trust and respect ▪ Technology transfer and R&D ▪ Technology/ideas and Know-how ▪ Infrastructure ▪ Access to financing and capitalisation ▪ Financial support and consulting ▪ In-kind financial support ▪ Talented managers ▪ Expert organisation and Coaching ▪ On-site business expertise
Lee and Osteryoung, (2004)	▪ Goal (clarity, achievement) ▪ Operation strategy (concreteness, realisation) ▪ Easy access to facility, equipment, and shared services ▪ Expert organisation ▪ Technology transfer and R&D ▪ Business and law consulting ▪ Financial support and consulting ▪ Entrepreneurial education program ▪ Institutional networking and the Networking of tenant ▪ Networking of financing/business consulting firm ▪ Government/local community support

Regarding the GCC literature that discussed the success factors of business incubation, Table 10 summarises the areas of success factors that was highlighted by the 28 studies related to GCC to cover various aspects that may have an impact on incubators' performance.

Table 10: Incubators' success factors discussed within GCC literature

Category of Success Factor	Success Factor	No. Success Factors Discussed in the Business Incubation Studies in the GCC (28 Studies)	Rank
Internal	Infrastructure	22	1
	Networking	13	2
	Human Resources	5	3.5
	Commercialization Condition	5	3.5
External	Market Condition	10	1.5
	Government Support	10	1.5
	Financial Resources	8	2
	Entrepreneurship Culture	4	3

As per the results are shown in Table 10, the infrastructure factor was considered as the highest internal enabling factor mentioned by the GCC literature, followed by the networking factor. Within the infrastructure factor, scholars discussed the importance of having value-added services that reflects the tenants' needs, the existence of rigorous application procedure to enter the incubator and having a regular evaluation process for incubated entrepreneurs. Also, commercialisation capabilities of the incubator to produce minimum viable products (MVP) were also recognised by the GCC studies.

With regards to the external enabling factors, the market condition and government support factors were considered as the most enabling factors discussed by the GCC scholars, followed by financial resources factor as shown in Table 9. Surprisingly, it was noticed that the GCC studies did not focus on the entrepreneurship culture and its

relation to the success of incubators in the GCC region and the UAE in specific. Therefore, the literature review on GCC literature conducted on business incubation has helped in covering different dimensions of proposed factors such as the level of collaboration with some crucial partners (universities, customers, and government entities) and the willingness level of entrepreneurs to be incubated in the UAE domain.

Due to limited related studies within the UAE domain; however, it is necessary to identify which of those success factors are more relevant to the UAE case. In this regard, and in order to identify the enabling factors for a specific case, Somsuk and Laosirihongthong (2014) adopted the resource-based view theory to determine the most relevant success factors, which affects the success of university-based incubators in Thailand. Sithole and Rugimbana (2014) supported using the resource-based theory for investigating the success factors of incubators; the researchers argued that resource-based view theory is useful for selecting the factors that directly influence the performance of the incubator in terms of graduating new technology-based firms.

In the UAE case, business incubators are at initial maturity stage; thus, in order to succeed in achieving their missions, it is critical to identify the factors that influence their performance. Therefore, this research will adopt a resource-based view theory as criteria for identifying the success factors of business incubators in the UAE. The resource-based theory is one the famous strategic management theories that are commonly used to evaluate the organisations' features and characteristics related to its performance and competitive advantage using different dimensions such as capabilities and resources (Somsuk & Laosirihongthong, 2014).

Thus, taking resource-based view theory into practice, this study will consider relevant factors that will either have an impact on the business incubators’ performance in the

UAE. As a result, based on the review and analysis of identified success factors in Table 9 and Table 10, as well as from resource-based view perspective, this study proposes eight critical factors that likely influence the success of business incubators in the UAE domain. The proposed success factors are: i) government support, ii) financial resources, iii) market conditions, iv) entrepreneurship culture, v) infrastructure, vi) networking, vii) hr, and viii) commercialisation conditions.

To explore the actual factors and the nature of the reasons of their influence in the UAE, interviews with stakeholders of incubators in the UAE were conducted, followed by conducting a survey questionnaire with the management of incubators and the incubated entrepreneurs to describe the identified factors and their level of influence for each identified factor. As such, in the following sections, the eight proposed factors of business incubators in the UAE are defined, discussed, and justified based on literature reviews as well as the selection criteria using resource-based view theory.

3.4.1 Government Support

One of the main factors related to business incubators' success is the support offered by the governments. Several studies indicated the importance of government support, and how it contributes to the success of incubators (Sun, Ni, & Leung, 2007; Chandra & Fealey, 2009; Alsheikh. 2009; Allen & Rahman, 1985). However, scholars did not agree on the specific type of support due to a different type of support offered by the government for business incubators. Researchers claimed that the support could be in the form of protecting legislation, exclusive incentives, simplifying procedures, providing intellectual property protection services, and facilitating the access to funding sources or allocating some funds for incubated entrepreneurs (Sun, Ni, & Leung, 2007).

In the UAE context, the country had set for itself a challenging goal to be a hub for entrepreneurs and start-ups in the Middle East region (National Innovation Strategy, 2014). To achieve such a challenging goal, the plan presumably starts with government policies and incentives as an enabling business environment for entrepreneurs to effectively initiate and sustain their businesses. The policies could be in the form of streamlining the license requirements to plague entrepreneurs into the commercial world, while the incentives could be in the form of exclusive offers and services for entrepreneurs to increase their chance of success (Somsuk & Laosirihongthong, 2014). In this regard, Alsheikh (2009) advocated for conducive policies and incentives to sustain the development of entrepreneurial ventures until it reaches to commercialised stage successfully. As such, the researcher recommended updating the current policies in order to help entrepreneurs to access the market and incentivise them with economic incentives, aiming to increase the rate of start-up creation.

The Government might also play a crucial part in securing and dedicating special funds for entrepreneurs to initiate their entrepreneurial ventures (Smilor, 1987). Moreover, protecting the intellectual property of entrepreneurs is one of the critical milestones for innovative entrepreneurs to succeed. Thus, the maturity and easiness of such a service are highly needed by entrepreneurs. In the UAE case, and according to Byat and Sultan (2014), the Government took serious steps towards developing efficient intellectual property rights system and benchmark it with international standards, aiming to leverage innovation practices and supported by associated offices as "TAKAMUL Programme".

Thus, by applying the resource-based view theory using the criteria of impact on the performance, it is assumed that business incubators will gain a significant advantage

(in a competitive market like UAE) with such as government support for entrepreneurs to grow and sustain against large entities. Therefore, in this study, Government Support in the UAE will be defined as building supportive policies that protect entrepreneurs, reward them with encouraging incentives, provide them with intellectual property protection services, and facilitate fund sources for them while they are under business incubation platform.

3.4.2 Financial Resources

The issue of financial resources has always been an integral part of incubation's success. Somsuk and Laosirihongthong (2014) defined financial resources as any financial source that entities may able to use for their business. Many researchers worldwide and within the region emphasised the importance of funding entrepreneurs and its accessibility (Obeidat & Abu-Shanab, 2010; Lish, 2012; Alsheikh, 2009; Verma, 2005; Elmansori, 2014; Sithole & Rugimbana, 2014). Thus, is it agreed that even highly promising entrepreneurs could not achieve success without sufficient financial support.

Elmansori (2015) for instance, recommended providing financial services in the form of sourcing donations from the respective industry, government, and R&D centres for business incubators to succeed. However, the sponsors of those financial resources may have different objectives in terms of when to support. Smilor (1987) argued that venture capitalists, for instance, prefer more mature incubated entrepreneurs that showed some market potential, while seed investors usually support entrepreneurs who are at the early stage of their entrepreneurial venture. In either case, incubators are considered a liaison between financial supporters and incubated entrepreneurs. Such a role by the incubators requires having experience in fund options with associated

conditions, smart decisions for raising funds, and level of funds at different stages of entrepreneurs' businesses.

In the UAE context, Byat and Sultan (2014) argued that the UAE aims to build the innovation ecosystem through human capital, technological capital, and financial capital. In the financial capital aspect, the government seeks to promote and provide different kinds of the funds, such as government funds, venture/angel capital, and crowd investment. In the government fund, the researchers showed that the UAE government took the serious initiative to support innovation practices, particularly in STEM fields through government funds sources such as the Khalifa Fund.

As far as private sector fund is concerned, Byat and Sultan (2014) argued that venture capital fund starts to become accessible due to the positive economic environment in the country. However, the researchers claimed that seed capital, angel investment, and crowdfunding are barely obtainable through business incubators due to the lack of maturity of such funds in the UAE. The researchers debated that those early-stage funds need to be increased in order to enhance the speed of innovative entrepreneurial ideas, and therefore, encourage venture capital funds to examine the potential entrepreneurial ventures for investment opportunities.

Thus, bringing the impact on performance as a criterion for selecting the success factors based on the resource-based view theory, incubators in the UAE may increase their chance of success if more financial resources are available for their incubated entrepreneurs. Therefore, this study will define financial resources as the availability of government grants, private sector funds, bank loans, venture capital funds, and R&D budgets at universities in the UAE.

3.4.3 Market Conditions

The UAE government decided to diversify its economy away from the oil sector and focus more on a knowledge-based economy. This requires active collaboration between knowledge sources (such as universities) and knowledge recipients (such as private sector entities), and how the related government entities are facilitating such collaboration. Academic scholars, as well as industry professionals, discussed the methods of collaboration in order to enhance economic growth and sustain it. Alsheikh (2009) claimed that several methods took place such as seconding faculty members as subject matter experts in the industry as well as bringing specialised industry professionals into universities for supporting commercial research projects. Although there was more focus on commercial outcomes to meet customers' needs, however, the researcher claimed that most of the collaboration cases were managed on an ad-hoc basis and was not systemised in order to sustain. Therefore, Alsheikh (2009) argued that in order to enhance national competitiveness, more steps need to take place for structuring commercialised research outcomes.

As far as the business incubators is concerned, there are very few studies investigated the market and economic conditions in which incubators need to be aware of in order to succeed (Alsheikh, 2009; Jamil, Ismail, & Mahmood, 2015). Smilor (1987) stressed on different kinds of support provided by the community in leveraging the incubated entrepreneurs as it reflects the goals of the community itself. The researcher claimed that the support could be in the form of tying with professional expertise and with educational entities, which also may assist in providing related technical infrastructure such as laboratories and support commercialising applied research projects at universities. Thus, the collaboration with universities might benefit all the related

stakeholders (entrepreneurs, university, SMEs related entities, and incubators). Sithole and Rugimbana (2014) highlighted the benefit of accessing technologies at universities, which significantly affects the success of incubated entrepreneurs.

The question arises whether the market condition in the UAE is collaborative in order to attract innovative ideas that can introduce new products and services through entrepreneurial ventures. This is a unique dimension to be assessed as one of the factors that may have an impact on the success of business incubators in the UAE. When discussing the market condition of the UAE, the country is rapidly increasing its knowledge in different fields due to the positive economic atmosphere. The UAE also enhanced its ranking in the Global Innovation Index (GII) reaching 35th in 2017 out of 127 countries (Global Innovation Index, 2017). The UAE earned this position due to its progress in various innovation-related measures such as market and business sophistication and knowledge and technology outputs. However, collaboration among innovation stakeholders is not evident and needs to be investigated.

Byat and Sultan (2014) argued that these collaborations are important; particularly, for SMEs due to its impact on their business performance in the long term. Thus, it is critical to address the market condition variable as one of the enabling factors that are expected to influence the performance of the incubators in the UAE, and therefore, their success. According to our knowledge, there is no research or professional report conducted on this factor and its relation to business incubation in the UAE.

Thus, using the impact on performance as a criterion of selecting the enabling factors, this study proposes market condition variable due to its critical role in evaluating the level of collaboration between universities, respective government entities, respective industry developers, and potential customers, in which it serves the mandate of

incubators in the UAE. Therefore, this research will define the Market Condition as "*the level of systemised collaboration between respective: government entities, universities, industry developers, and customers with business incubators in the UAE*".

3.4.4 Entrepreneurship Culture

Entrepreneurship culture remains an essential aspect of leveraging entrepreneurial practices in any country. In the same time, having entrepreneurship culture leads to increase the sources of entrepreneurial ideas and therefore, sustaining the supply of potential entrepreneurs for business incubators. Several studies addressed the importance of entrepreneurship culture and its relation to the business incubators (e.g., Alsheikh, 2009; Byat & Sultan, 2014; Al Saiqal, 2017; Veciana, Aponte, & Urbano, 2005). Alsheikh (2009) defined entrepreneurship culture as creating a business environment that is favourable for entrepreneurs to start their own business and grow in the market independently.

In his study, Aernoudt (2004) highlighted the importance of the entrepreneurial environment in sustaining the supply of ideas for incubators, which is one of the main determinants for incubators' survival. Besides, according to the Global Entrepreneurship Monitor (GEM Report 2017), entrepreneurship is a behaviour characterised by their intention toward developing future business and going through the necessary process, which requires a supportive culture to achieve it. Measuring entrepreneurship culture is, however, very complex and requires several breakdowns of its associated elements, and one of them is entrepreneurial orientation. Rauch, Wiklund, Lumpkin, and Frese (2009) defined Entrepreneurial orientation as a strategic behaviour of an entity that identifies the status of their innovativeness, risk-taking, pro-activeness, competitive aggressiveness, and autonomy to pursue new opportunities.

Burnett (2009) justified the use of entrepreneurship intention as a measure to assess its impact on the performance of business incubators in Australia. Some other studies discussed the five dimensions of entrepreneurial orientation in details to assess the behaviour of a firm. Lechner and Gudmundsson (2014) discussed the innovativeness of small firms and how they are differentiated by degree of introducing novel ideas and seek to identify future opportunities, while Burnett (2009) defined innovativeness as having the capability and interest to introduce and try new products, processes, and new sources of supply.

The risk raking is also considered as another core dimension of entrepreneurial culture. Burnett (2009) defined the risk-taking of small firms as the tolerance of ambiguity to handle the failure of trying or loss of assets. Alsheikh (2009) encouraged the practice of risk taking due to its importance in converting entrepreneurial ideas into commercial products and services. However, Al Saiqal (2017) claimed it is difficult to test the risk-taking level of entrepreneurs due to the difficulties in measuring risk. Nevertheless, it is reasonable to assume that entrepreneurs need to take serious actions rather than being conservative while pursuing their entrepreneurial ventures. Thus, having such a culture make entrepreneurs more interested in sharing their ideas and eventually, perform better to take their entrepreneurial ideas to the next level.

In the UAE context, few studies conducted on entrepreneurship culture; therefore, minimal information is available to assess the willingness of entrepreneurs in the UAE to be nurtured within the business incubation environment. However, in her study results, Al Saiqal (2017) revealed that the UAE males are more favourable than females toward starting new businesses, and even more with the segment that studied outside the country. Also, having a competitive compensation within government jobs,

the researcher attributed the low intention of starting new businesses due to low necessity among the UAE youth. However, the researcher indicated that this trend is starting to change due to government direction to move the employment of UAE nationals to the private sector, as well as putting incentives such as funds to pursue entrepreneurship as a career choice.

Thus, is it critical to investigate the entrepreneurship culture in the UAE as one of the enabling factors for business incubators to succeed? This is considered a new knowledge that expected to contribute to the studies of entrepreneurship culture in the UAE, specifically when evaluating the entrepreneurs' level in terms of the novelty of their ideas, risking taking, identifying future opportunities, and their willingness to be nurtured under an incubation environment. Also, applying the criteria of impact on business incubators' performance, entrepreneurship culture is increasingly recognised by the UAE government as one of the innovation enablers (Byat & Sultan, 2014), which sufficient numbers of them might reside under incubation platforms. Therefore, for this study, the entrepreneurship culture will be described as the capacity of existing entrepreneurs to generate and develop novel ideas, risk-taking, identifying future opportunities, and their willingness to be incubated within the UAE domain.

3.4.5 Availability of Infrastructure

Scholars and industry related professionals almost agree that the infrastructure of a business incubator is one of the essential aspects of its success. Researchers extensively covered the infrastructure dimension in their studies (Obeidat & Abu-Shanab, 2010; Lish, 2012; Sithole & Rugimbana, 2014; Elmansori, 2014). However, the infrastructure may include many tangibles, as well as intangible aspects. Somsuk and Laosirihongthong (2014) referred tangible aspects at incubators to physical objects

such as equipment, labs, and workspaces that can be utilized by incubated clients, while intangible aspects of incubators were referred to soft services offered by the incubators such as mentoring and management services provided for incubated entrepreneurs (Sithole & Rugimbana, 2014).

Thus, researchers did not agree on a specific list of tangible and intangible services to be provided at each incubator. This may have attributed to different types of incubators and the nature of clients they are serving. However, the standard services that are expected to be offered at business incubators may include (but not limited to):

- Develop business plans and feasibility studies.
- Provide different size of workstations/space.
- Provide management services (legal, marketing, HR, accounting, ICT).
- Provide mentoring and different types of training (technical, soft skills, management, and the like).

Sithole and Rugimbana (2014) debated that resources at incubators are critical and positively related to graduating in new technology business firms. Thus, those offered services are expected to add value for incubated entrepreneurs but may vary from one incubator to another and may outsource depending on the nature and status of an incubator. Scholars also discussed the positive impact of having an entry and exit criteria at the incubators on the success rate of incubated entrepreneurs (Sithole & Rugimbana, 2014). However, scholars did not agree on a specific set of entry and exit criteria. Sithole and Rugimbana (2014) supported the importance of having entry and exit criteria due to its benefits in selecting entrepreneurs with the higher chance of success and growth, while Smilor (1987) advocated for criteria that indicate for novelty and has the potential for growth, which may able to create jobs.

In GCC literature, Alsheikh (2009) highlighted some of the entry criteria that were recommended by different scholars, such as:

- Ability to pay the rent.
- Capital availability.
- Commercialised product.
- Competence, marketing, and distribution, technical support
- Competitor analysis.
- Existing cash flow stream.
- Growth potential.
- Qualified management team.
- Industry demand.
- Sales profit potential.

On the other hand, while the entrepreneurs are incubated, it is also critical to have a clear contract that manages the relationship between the incubator and the incubatees. Also, incubated entrepreneurs need to show their progress in order to be further supported. Smilor (1987) assumed that such a relationship is sensitive because both sides have different expectations during the incubation cycle. In this regard, Sithole and Rugimbana (2014) argued that university-based incubators must balance between adopting strict university policies about using resources and the incubated entrepreneurs' requirements related to their project progress. Therefore, the more governance is adopted between the two sides; the better outcomes are expected to be realised.

In the UAE, the local governments have invested heavily in recently established incubators. Therefore, and based on the above discussions, determining the factors that

may have an impact on the incubators' success from the resource-based view theory perspective, it is ideal for adding the availability of infrastructure as one of the factors to be investigated. This could be justified due to its impact on incubator's performance and positioning assess their competitive advantage in terms of added-value services and facilities offered for entrepreneurs. Thus, this research will refer to the infrastructure of the incubator to the availability level of having entry & exit criteria, incubated clients' contract, progress criteria, and soft services to incubated entrepreneurs.

3.4.6 Availability of Networking

Business incubation concept is part of the entrepreneurship ecosystem that seeks to interconnect all its elements systematically for entrepreneurs to succeed. Sufficient numbers of researchers and industry professionals addressed the networking impact as part of enabling factors for incubations' success (Lish, 2012; OECD, 1997a; Bøllingtoft, 2012; Sithole & Rugimbana, 2014), while some other scholars gave the networking factor special attention by dedicating their research into this factor. Sun, Ni, and Leung (2007) highlighted the substantial effect of the networking factor on other related factors such as access to fund and expertise.

Smilor (1987) also claimed that the networking factor has an impact that is beyond the incubator capacity in terms of leveraging technical knowledge from external expertise, as well as within business incubator capacity through exchanging of experiences among incubated entrepreneurs. Therefore, the availability of networking helps in managing common related obstacles that entrepreneurs usually face during a different stage of their entrepreneurial ventures. In this regard, Smilor (1987) argued that

entrepreneurs would be attracted to incubators that are well-connected with public and private entities, which are expected to be their future clients.

In the case of UAE, and according to Byat and Sultan (2014), the government is promoting for a collaborative approach between respective government entities, private companies, and universities to promote entrepreneurship practices and build linkages among related stakeholders. Thus, it is ideal for incubators to have networking capabilities and therefore, can support the entrepreneurship ecosystem by connecting the incubated entrepreneurs with universities, industry-related experts, fund sources, and potential customers. In this regard, Alsheikh (2009) argued that all kinds of networking are essential for entrepreneurs' success and under-connected business incubators' management, which eventually, distinguish them from being standard work-space entities.

NBIA (2000) also supported the critical role of networking activities, particularly in managing the relationships with fund sources in order to provide better deals for investing in entrepreneurial ventures. Thus, applying the criteria of impact on incubator's performance as well as having a competitive advantage (based on resource-based view theory), the incubators that have strong networking accessibility may have a substantial competitive advantage to succeed. Therefore, in this study, we will define networking as "*the accessibility level of an incubator to information sources, expertise in targeted fields, fund sources, and targeted customers*".

3.4.7 Human Resources

Like any other structured entity that has the mandate to realise, the human resources dedicated to managing and operating the business incubators is a critical factor to

achieve its mission. Thus, it is important to have qualified and experienced human resources that that can drive an entrepreneurial journey from idea generation to commercialised products and services. Somsuk and Laosirihongthong (2014) defined human resources at business incubators as: "*a business incubator's management team* and staff whose unique talents and skills are vital to the business incubator success".

According to several research studies, the role of human resources varies from assessing the entry and exit of entrepreneurs to operate the activities of the incubator, manage/deliver the services offered to entrepreneurs, and govern the incubator based on its mandate (O'Neal, 2005; Somsuk, Wonglimpiyarat, & Laosirihongthong, 2012; Bernier, 2000). Besides that, human resources at incubators can be classified into two categories. The first category is the permanent management team dedicated for implementing the strategy of the incubator and managing the daily operation, while the second category is the technical team, which could be either permanent, seconded, or outsourced. The technical team is usually considered subject matter experts in different phases of entrepreneurs' lifecycle such as having technical knowledge in business valuation or expertise in marketing products. In this regard, Lish (2012) argued that the level of knowledge transferred from the technical team to the incubated clients would determine the level of their success.

On the other hand, irrespective of incubation's type, the management team of incubators also plays an active role during different stages of incubation such as registering intellectual property rights, establishing start-ups and provide for the effective operation of start-ups. However, this entails having qualified and experienced personnel that went through such experiences and able to share it with incubated entrepreneurs. In this regard, Kamdar (2012) claimed the experienced management

team of an incubator could play a critical role in sourcing useful support for incubated entrepreneurs, while Smilor (1987) highlighted the added value of the incubator's director in bringing subject matter experts to support incubated entrepreneurs in terms of networking capabilities.

In the GCC region, Alsheikh (2009) emphasised the professional relationships of incubation management due to their impact on bringing extra resources and add-value services such as funds, experts, and customers. The researcher also stressed the vital role they might be playing in alliances with sponsors for the benefit of incubated entrepreneurs. Such a role becomes even more critical if the type of incubator would be a profit-making, which requires even having sources of income to sustain the operation of the incubator.

In the UAE domain, and according to our knowledge, there are no studies discussed the importance of human resources for business incubators to succeed, as well as their expected impact on incubators' performance (based on resource-based view theory perspective). As such, human resources will be as assessed as one of the factors that may affect incubation's success in the UAE. Therefore, this factor will be defined as the availability level of qualified and experienced human resource personnel at the business incubator that manages the entrepreneurial journey from idea generation to commercialised products and services.

3.4.8 Commercialization Conditions

It is known that innovation and new technologies became the main economic drivers of the 21st century. Thus, fostering innovation practices will have a positive impact on advancing economies, which may lead to creating jobs and introducing new products

and services. This exercise has a lifecycle, which consists of idea development, concept assessment, feasibility assessment, registering patent, prototyping new product/services, and product testing. So, going through such lifecycle requires two main elements: first; capabilities that can assess, develop and support innovative ideas.

Second, a system that can organise and manage the related innovation elements to achieve its objectives. Based on their commonly known function, business incubators usually accommodate those two elements in order to produce innovative products and services through their incubated entrepreneurs. Thus, such lifecycle requires effective and dedicated capabilities and methods that can support incubated entrepreneurs (Alsheikh, 2009; Lish, 2012; Elmansori, 2014; Jamil, Ismail, & Mahmood, 2015).

On the other hand, intellectual property right protection is also a very critical step that entrepreneurs need to go through for their innovative projects. It enables them to commercialise their projects and gain a competitive advantage in the important market. Although the government may support the intellectual property rights through policies, procedures, and process the registration of patents, however, entrepreneurs may still need support in following the right procedures, where to apply, and how to process it, especially when the investors get involved.

In the GCC related studies, Alsheikh (2009) emphasised two main strengths that business incubators need to have, first; the product development strength in which incubators have the technical capabilities. Second; the marketing strength in which incubators can assist in feasibility and marketing products using different methods. In this regard, Mubaraki and Busler (2012) claimed that incubators are highly useful in conducting activities that assess the feasibility and commercialisation opportunities at different stages of the projects' maturity. However, the researchers recommended

further investigation in order to succeed in commercialising technologies within the GCC region, particularly from universities.

In the UAE case, the National Innovation Strategy (2015) emphasised research and development that reflects the industry needs, and particularly in seven targeted sectors. Thus, based on this strategy, incubators are expected to promote innovative products and services in those seven areas among potential entrepreneurs in the community. Therefore, when applying criteria of a competitive advantage that based on the resource-based view theory, commercialisation condition is proposed as one of the potential enabling factors due to its influence on incubators' performance, particularly in the form of having programs run by capable team in developing ideas, testing concepts, supporting IP registration, and start-up creation, which increases the chance of entrepreneurs' success, and therefore, realize the incubators' mandate.

As such, in this study, commercialization condition will be defined as the capability of incubators to support the entrepreneurial ventures in terms of generating ideas, testing concepts, assessing the feasibility of products/services, supporting intellectual property rights procedures, prototyping/testing product/services, and creating start-ups using effective and efficient mechanisms. Thus, based on the above-suggested critical factors for business incubators to succeed in the UAE domain, and the adoption of "control" aspect to categorise those success factors, the proposed critical factors are distributed as follows in Table 11.

Table 11: Success factors of business incubation in the UAE

Internal Factors	External Factors
Infrastructure	Government Support
Networking	Financial Resources
Human Resources	Market Condition
Commercialization Condition	Entrepreneurship Culture

3.5 The Roles of Business Incubators in the UAE

Researchers and industry professionals around the world extensively investigated the roles of business incubators in general and their roles in supporting entrepreneurs in particular (Lish, 2012; O'Neal, 2005, and Salem, 2014). Aberham (2011), debated that the incubators may play a significant role once a suitable environment is provided. However, the expected roles of incubators are multidimensional, which could be at a micro level such as creating jobs, as well as a macro level such as developing entrepreneurship culture. Those roles could be assessed on a quantitative basis such as some new products and services produced out of incubators, as well as on a qualitative basis such as developing entrepreneurial culture (Mian, 1997). However, in either case, the expected roles of incubators could be better understood once the objectives of their establishment are defined.

In the GCC countries, the trend of establishing incubators increased in recent years. According to Khorsheed, Alhargan, and Qasim (2012), incubators were established mainly due to employment pressures and difficulties to access the private market by potential entrepreneurs. Besides that, a few studies highlighted a range of roles that incubators can play. The initial look at the roles shows some strategic roles as well as other individual roles expected from incubators in the GCC. When the table (12) is

further analysed, it was noticed that the incubation studies in the GCC have rated "contribute to the local economy" as the highest expected roles, while supporting the entrepreneurship culture were considered as the lowest roles expected from incubators. This indicates that GCC studies have high expectations from graduated start-ups to support socio-economic plans, while the entrepreneurship culture is not expected to be part of incubators' roles although they can become an enabler for it.

Nevertheless, the six proposed roles of business incubators have been considerably mentioned by GCC related studies. As far as UAE business incubation studies, the impact of business incubation showed similar to GCC studies in general covering almost all the six defined roles (Elmansori, 2014; Hamad & Arthur, 2012; and Byat & Sultan, 2014). The outcomes of the mentioned studies provided a better understanding of the areas the business incubators might contribute to the GCC states; those studies also conducted in the GCC domain presented some valuable insights that helped to design a primary survey data collection for this study. Table 12 presents the areas of incubators' roles in the GCC region, which categorised into six defined roles.

Table 12: Summary of Business Incubators' Roles Discussed Within GCC Studies

Category of Roles	Roles of Business Incubators	No. of Suggested Roles Discussed by 28 Studies in the GCC	Rank
Macro Level	Develop entrepreneurship culture	11	4
	Contribute to local economies	24	1
	Support National Innovation strategies	13	3
Micro Level	Nurture entrepreneurs	13	3
	Create jobs	17	2
	Commercialised products/services	13	3

As far research studies carried out in the UAE context, although the related studies were even fewer, Hamad (2012) stressed on the benefits of initiating business incubators in order to support entrepreneurs and SMEs through shared services and physical facilities, and therefore, increase the supply of entrepreneurial businesses in the private sector market. In this regard, Elmansori (2014) revealed the critical roles of incubators in reinforcing entrepreneurship practices in the UAE domain.

The researchers argued that incubators act as an enabler for entrepreneurs to sustain and grow their businesses. With regards to public owned incubators, AL-Mubaraki and Busler (2014) claimed the critical role of incubators in increasing the success rate of newly established start-ups. Byat and Sultan (2014) supported this view; the researchers indicated the role often incubators in the UAE in fostering entrepreneurs through value-added services. Thus, those few studies conducted on the UAE have shown some roles of incubators concerning supporting entrepreneurship practices. Therefore, building on international studies in general, and the GCC studies in particular, the expected roles of business incubators in the UAE will be classified into the micro and macro level. This study will propose three roles of business incubators that are at micro (individual) level, which are: i) Nurture entrepreneurs, ii) Create jobs, and iii) Commercialise new products and services.

This study also proposed three roles of business incubators that are at macro (strategic) level, which are: i) develop entrepreneurship culture, ii) contribute to the local economy, and iii) support national innovation strategy. Consequently, some scholars and industry professionals around the world as well as within the GCC region discussed those roles in detail and identified their importance. In the following sections, each expected role with their impacts will be discussed in great details.

3.5.1 Develop Entrepreneurship Culture

Concerning the entrepreneurship culture, this is possibly considered as one of the most challenging roles that are beyond the full capacity of business incubators. However, incubators presumably may play a supportive role in accelerating entrepreneurship culture. One of the reasons for such a challenge is that the education systems in the GCC region is currently serving employment but not necessarily entrepreneurship. Thus, the expectations from incubators are becoming even higher in this region to accommodate the students that have no entrepreneurship skills.

Alsheikh (2009) agreed with this challenge and viewed entrepreneurship culture as an important determinant that can be supported by incubators to increase the community of entrepreneurs. The researcher claimed that such a culture might have a higher tendency in risk-taking, continuous learning, and developing ideas. Hedner, Busler, and Abouzeedan (2010) also shared the same view; the researchers assumed that stakeholders of incubators in both Europe and GCC regions are aware of their benefits. However, they vary in their activities and roles depending on the country and the culture of entrepreneurship. Thus, although incubators are considered at an early stage of maturity in the UAE, it is necessary to examine their roles incubators in enhancing the entrepreneurship culture in the country and identify how it is taking place.

3.5.2 Contribute to the Local Economy

The roles of incubators in contributing to the local economy have always been in the centre of attention by related scholars (Al-Mubaraki & Busler, 2013; Aberham, 2011; Hires, 2010). The contribution to the local economy is a collective of many small benefits that support the economy to grow such as job opportunities, enterprise creation, and introduce local products and services. According to Al-Mubaraki and

Busler (2013) incubators are useful in creating small businesses in different industries, which may eventually support the local economy. In the case of incubators based in universities, Aberham (2011) claimed that commercialised technologies and selling licenses from university-based incubators might contribute to the local economy. As such, it critical to evaluate how business incubators in the UAE is contributing to the local economies.

3.5.3 Support National Innovation Strategy

As far as the role of business incubators in supporting the national innovation strategy in the UAE, this is considered a new dimension of the study, which has not been researched. In this regard, Akhuemonkhan, Raimi, Patel, and Fadipe (2014) investigated the potential of technology incubation centres in Nigeria in order to achieve their 2020 vision. Based on their research findings, the researchers suggested exploiting technology incubation centres as a new mechanism through benchmarking with other countries, aiming for entrepreneurs to create new start-ups, and therefore, be able to create jobs through their businesses. Böhringer (2006) also encouraged having specialised incubators that can serve targeted industries in a country as part of its national strategy.

In the UAE case, the government has recognised innovation as a strategic approach for future economic and social development. Therefore, the leadership of the UAE stressed the importance of applying innovation in all sectors. As the National Innovation Strategy was announced in 2014 aiming to sustain the economic and social growth and become one of the most innovative countries in the world, the strategy has set for itself several goals and one of them is to incubate innovative products and services, as well as promoting incubators in the UAE for entrepreneurs in order to

transfer their ideas into viable projects. Thus, this dimension could be interesting to be investigated in order to evaluate to what extent the current business incubators are supporting the national innovation strategy in the UAE throughout this study.

3.5.4 Nurture Entrepreneurs

One of the significant roles of business incubators that are highlighted by scholars is their ability to develop entrepreneurial skills (Salem, 2014; Castro, Galán, & Bravo, 2014; Aberham, 2011). Business incubators are perceived to be a useful platform in which entrepreneurs can be developed and supported until they graduate from the incubator. By combining the entrepreneurial capabilities with services and facilities offered at the incubator, entrepreneurs can increase their success chances in the market (Salem, 2014). Besides that, the value creation of establishing incubators revolves around capable entrepreneurs to sustain in the open market (Madichie, 2010).

Moreover, Aberham (2011) considered that technology incubators are efficient enablers that can develop entrepreneurs when conducting technical activities. As a result, the benefits of nurturing entrepreneurs may increase dramatically when well-established incubators accommodated them and provided by added-value services. In the UAE case, the capability development aspect has always been in the centre of attention by the leadership of the UAE. According to Byat and Sultan (2014), the government in the UAE has put the capability development and in seven economic sectors (Renewable and clean energy, transportation, technology, education, health, and water) as a top priority. Thus, it is necessary to evaluate business incubators in the country in terms of their roles to nurturing entrepreneurs. In this regard, Byat and Sultan (2014) revealed that the limited technical talents within the UAE are attributed to a low number of students in STEM fields (science, technology, engineering, and

mathematics). As a result, the seven economic sectors may face challenges in supplying technical capabilities who contributes to their future development.

3.5.5 Create Jobs

Scholars around the world and within the region have almost agreed on the role of business incubators in creating job opportunities (Lish, 2012; O'Neal, 2005; AL-Mubaraki & Busler, 2014; and Elmansori, 2014). Aberham (2011) considered that incubators are an efficient platform that accommodates entrepreneurs through part-time and full-time jobs. In the GCC region, and according to AL-Mubaraki and Busler (2014), creating SMEs as well as jobs were considered as the most two beneficial outcomes from business incubators.

Elmansori (2014) supported these outcomes through his study conducted on the impacts of incubation centres in Jordan and the UAE. He found that creating jobs, economic development, and economic transformation were the most benefits gained from establishing incubation centres in those two countries. Thus, it is ideal for assessing the role of incubators in the UAE throughout this study from a job creation perspective, and how incubators are supporting the government in shifting the jobs from public to private entities.

3.5.6 Commercialise New Products and Services

Commercialising new products and services through business incubators has been under the attention of related scholars worldwide and recently within the region (Khorsheed, Al-Fawzan, & Al-Hargan, 2014; Alsheikh, 2009; EL-Midany & Shalaby, 2009; and Westhead & Storey, 1995). According to Hires (2010), incubators are considered an efficient platform that could optimise scattered resources in order to

commercialise new businesses, particularly in high population countries. In this regard, AL-Mubaraki & Busler (2014) brought the case of incubators in China as an example; the researchers showed that their local incubators had helped the country to commercialise technologies that were developed within their incubators successfully.

On the other hand, concerning technical activities conducted at university-based incubators, Westhead and Storey (1995) assumed that it is expected to transfer technologies, issue licensing agreements, and spin-off enterprises when R&D resources are directed towards the industry needs. In the GCC region, few scholars discussed commercialising new products and services as part of incubators' role. Alsheikh (2009) and Salem (2014) advocated for products and services that are created locally through incubators and particularly that are university-based due to their higher chance of success. In this regard, Khorsheed, Al-Fawzan, and Al-Hargan (2014) highlighted the case of BADIR incubator in serving three industries (ICT, biotechnology, and advanced manufacturing) in Saudi Arabia.

In the case of UAE, the government is taking serious steps to move from oil-based to knowledge-based economy by supporting innovators through incubators in transforming their potential ideas into commercialised products and services. However, the incubators in the UAE are under the maturity stage. Therefore it is important to investigate to what extent they have been successful in producing new products and services and what are the key factors in achieving this mission.

3.6 The Proposed Conceptual Business Incubation Framework in the UAE

The conceptual framework organises the context of the research and presents the related variables in a meaningful structure. Few researchers proposed a theoretical

framework for the success of incubators, Verma (2004) for instance, suggested to have a suitable theoretical basis for assessing the success of incubator programs, in which it covers four dimensions: community level impact, incubator level impact, clients of incubator, and the performance of the incubator managers.

However, scholars did not agree on a specific framework for incubators' success; therefore, based on their objectives, each country developed its framework. As a result, due to the fast growth of the incubation concept in the UAE, it is worth conceptualising the critical success factors of incubators and their roles within the UAE context under one framework. Also, it was noticed that regional researchers, as well as industry professionals, have not studied the performance of business incubators in the UAE, particularly after the announcement of National Innovation Strategy in 2014.

However, the only two cases were the study of Elmansori (2014) who addressed the characteristics and the performance of the incubators in the UAE and compared it with Jordan, while the study of AL-Mubaraki and Busler (2014) have compared the status of incubators with other GCC countries. Therefore, their results showed that the government support, access to funding, and value-added services offered to their clients at the incubators were critical factors for business incubators' effectiveness (Elmansori, 2014; Madichie, 2010).

Thus, it is worth mentioning that the comprehensive review within the academic literature, as well as the industry reports, have helped in developing the proposed framework. This thesis aims to structure the success of incubators through the proposed framework in which it contains several critical factors (internal and external independent factors) in the UAE (as independent variables) and their influence on the success of incubators (dependent variable). Besides assuming the incubators in the

UAE are successful, the conceptual framework is also addressing a separate relationship between successful business incubators as an independent variable, and specifically related roles (six roles at macro and micro level in the UAE) as dependent variables.

As a result, building on some international studies that proposed frameworks on incubations' success (Verma, 2004; Smilor, 1987; Lish, 2012), as well as on regional related studies (Alsheikh, 2009; Elmansori, 2014), this study proposes a conceptual framework of business incubation in the UAE as shown in Figure 4. The conceptual framework is developed after reviewing and justifying all the relevant constructs (success of business incubators, success factors, and the roles of business incubators in the UAE) that constitutes the proposed framework. However, the suggested framework will be confirmed at the end of the study once it is evaluated throughout this research. This is to validate the influence of each factor on the success of business incubators, as well as confirming the suggested roles of business incubators in the UAE.

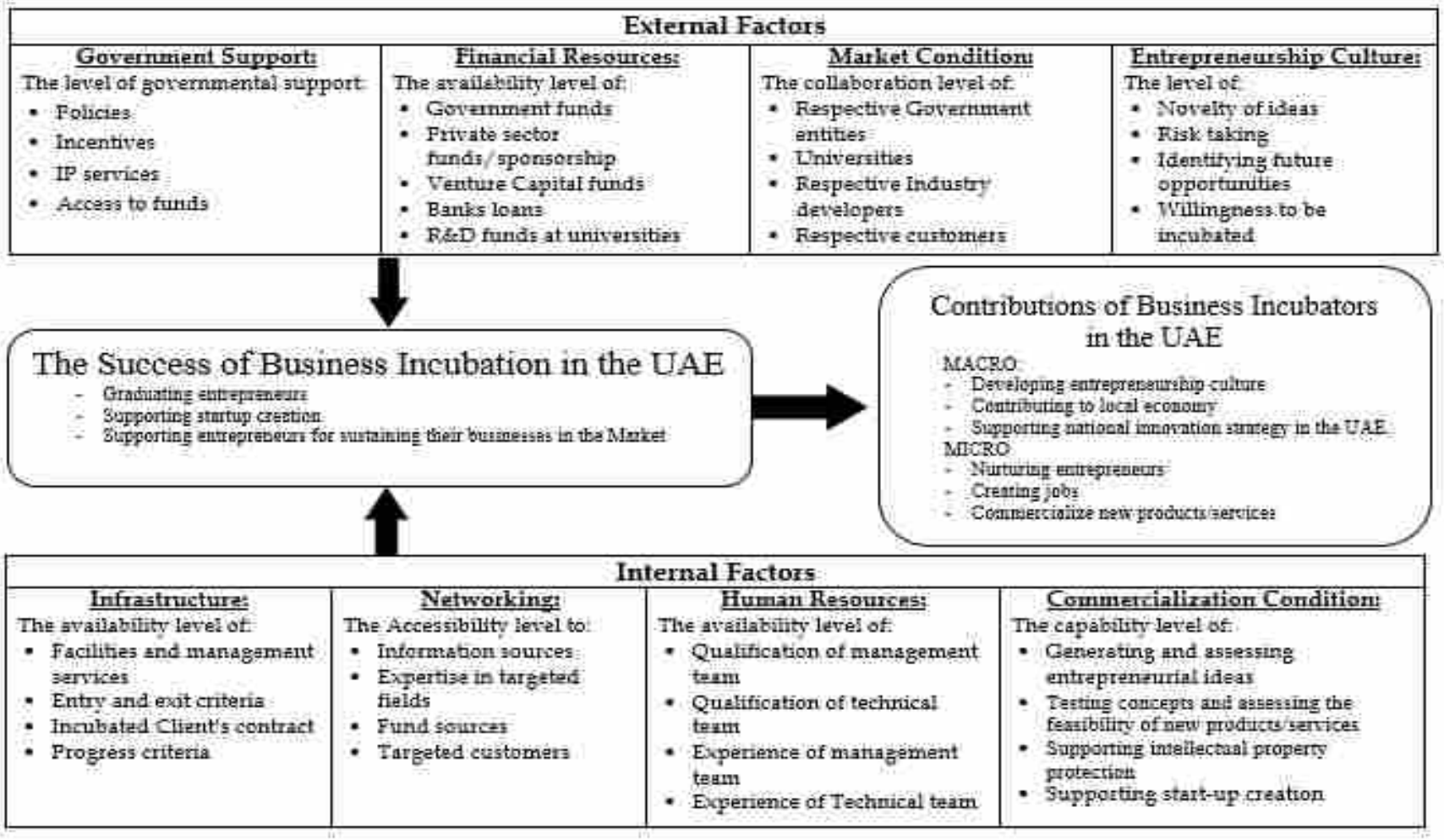

Figure 4: Conceptual framework of business incubations' success in the UAE

3.7 The Research Hypothesis

The literature reviews on business incubation (worldwide and within the GCC region) has identified several factors that may influence the success of business incubators. Those identified factors are a set of variables that can be turned into research hypotheses to be tested throughout this study. Therefore, in order to set specific conditions for the success of business incubators in the UAE and based on the critical factors (variables) identified by the above studies that may have an influence on the success of incubators, a set of research hypotheses have been developed, which addresses the relationship between the influencing factors (independent variables) and the success of the incubators in three dimensions. Table 13 presents the proposed research hypotheses with associated research questions as followings:

Table 13: Research Hypotheses with the Associated Research Questions

#	Hypothesis	Related Research Questions	Statistic employed
Hypotheses Testing the Relation Between Internal Factors and Business Incubators' Success Indices			
HI_{CF1}	The higher the availability level of incubators' infrastructure, the more business incubators will succeed.	2	Correlation
HI_{CF2}	The higher level of networking accessibility of the incubator, the more business incubators will succeed.	2	Correlation
HI_{CF3}	The higher level of qualifications and experiences of the management and the technical team at the incubators, the more business incubators will succeed.	2	Correlation
HI_{CF4}	The higher the level of commercialisation conditions of the incubators, the more business incubators will succeed.	2	Correlation

Table 13: Research Hypotheses with the Associated Research Questions (Continued)

#	Hypothesis	Related Research Questions	Statistic employed
Hypotheses Testing the Relation Between External Factors and Business Incubators' Success Indices			
HE_{CF5}	The higher the level of government support, the more business incubators will succeed.	3	Correlation
HE_{CF6}	The higher the availability of financial resources, the more business incubators will succeed.	3	Correlation
HE_{CF7}	The higher level of collaboration, the more business incubators will succeed.	3	Correlation
HE_{CF8}	The higher the level of entrepreneurship culture, the more business incubators will succeed.	3	Correlation
Hypotheses testing the four Internal Factors as predictors of the Success of Business Incubators			
HI_{R1}	The internal factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator.	2	Regression
HI_{R2}	The internal factors contribute positivity to the success of business incubators in terms of creating start-ups.	2	Regression
HI_{R3}	The internal factors contribute positivity to the success of business incubators in terms of sustaining start-ups in the market.	2	Regression
Hypotheses testing the four External Factors as predictors of the Success of Business Incubators			
HE_{R4}	The external factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator.	3	Regression
HE_{R5}	The external factors contribute positivity to the success of business incubators in terms of creating start-ups.	3	Regression
HE_{R6}	The external factors contribute positivity to the success of business incubators in terms of sustaining start-ups in the market.	3	Regression

The above research hypotheses will be tested using relevant research analysis method in chapter five, while the results of testing the hypotheses as discussed in Chapter 6.

3.8 Conclusion

Although there are limited studies conducted on business incubation in the GCC region, there were some important attempts by a few scholars that set the foundation of knowledge in this field. This chapter achieved the first research objective by adding to the previous incubation studies but focusing more on the critical factors for incubators to succeed and examine their roles in the UAE. The in-depth review of the previous literature has helped in proposing a conceptual framework for incubation's success in the UAE.

In this Chapter, the analysis of the literature reviews has shown that the success of incubators in the UAE are realised when they can: i) graduate entrepreneurs, ii) support creating start-ups, and iii) sustain entrepreneurial businesses in the open market. Based on the literature reviews, this study also proposed eight enabling factors (government support, financial resources, market condition, entrepreneurship culture, infrastructure, human resources, networking, and commercialisation condition) that may have an impact on incubators' success. Moreover, those suggested factors have been categorised into internal and external factors.

Furthermore, the study proposed three strategic roles (contributing to the local economy, supporting national innovation strategy, and developing entrepreneurship culture) as well as three roles that promote entrepreneurship practices (nurturing entrepreneurs, creating jobs, and commercialise products and services) in the UAE. All constructs of the conceptual framework were discussed and justified their existence. Accordingly, the study developed eight research hypotheses to be tested throughout this study.

Chapter 4: Research Methodology

4.1 Introduction

In the past two decades, business incubators played an active catalyst role in accelerating the development of entrepreneurs and start-ups worldwide (Alsheikh, 2009; AL-Mubaraki & Busler, 2014). Those studies have been conducted using different methodologies based on the nature of the study objectives. In this study, chapter one discussed the research problem concerning incubation's status in the UAE. Also, extensive literature reviews have been conducted covering comprehensive studies and within the GCC region in chapter two. As a result, a framework of incubation's success in the UAE in chapter three is developed based on a set of research hypothesis to be examined throughout this study.

This Chapter defines how this research will be conducted in order to achieve the study objectives by answering the research questions. Thus, a suitable research methodology is required to address the research questions based on study objectives correctly. The chapter consists of two parts; the first part discusses the research paradigm, strategy, and methodologies adopted by related scholars in business incubations studies as well as the adopted ones in this research. In the second part, the research design is discussed in great details by determining the method of achieving each research objective, particularly the collection of primary data using the suitable research instrument as well as the analysis of primary data using suitable data analysis method. Finally, the chapter summarises with the methodological framework as well as some ethical considerations has been taken into consideration while conducting this study based on the UAE University ethics standards.

4.2 Research Paradigm

Before selecting a research methodology for the study, the researcher must have some background of research understanding and explanations (McAdam, 2004). According to Gummesson (2000), the research paradigm is defined as positioning the research in terms of identifying the research problem, ways of understanding the problem, and what is critical to be investigated. Also, Perry, Riege, and Brown (1999) described the research paradigm guides in three aspects: i) Social reality that is being researched (research ontology), ii) Features of knowledge collected as well as the researcher's relation to the study (research epistemology), and iii) The technique used (research methodology) by the researcher to find reality.

With regards to research ontology, it is the paradigm aspect that defines the characteristics of social reality that is being researched, whereas research epistemology is concerned with the features of knowledge that are being investigated and the relationship between the researcher and what is being studied (Burnett, 2009). It is known that any scientific research that is adequately developed to bring the research paradigm into practice are placed within nine different kinds of research paradigm, these are *ethnographic, holistic, realism, experimental, positivist, critical interpretive, requisite holism, descriptive,* and *applied* (Burnett, 2009).

The next paragraphs sheds light on three types of research paradigms; these are:

i] *Positivism*: According to McAdam (2004), the positivism paradigm adopts an objective approach by dealing with tested external facts that were built based on previous experiences, and away from subjective interpretations. The positivism paradigm aims to discover realities by analysing its disconnected components in order to deduce and then approve the respected hypothesis. This

exercise is achieved by following a structured data collection and analysis method using quantitative tools such as surveys. The researchers that are following the positivism paradigm are characterised by keeping their distance from the investigated subject, which allows the researched hypothesis to be free from subjective interferences.

ii] *Social Constructionism*: The social constructionism paradigm follows subjective approach by dealing with peoples' perception when explaining a phenomenon (Hair Jr, 2006). The researchers adopting the social constructionism seeks to interpret the meanings based on a range of interrelationship components (values, cultural context, and personal experiences) of investigated phenomena (McAdam, 2004).

iii] *Holistic Research*: The holistic paradigm is characterised by understanding a phenomenon based on a group of components that are integrated (Lawson-Tancred, 1998). Thus, the reality cannot be determined by addressing the individual related components of a system or specific area of specialisation. Instead, the system as a whole is observed to find patterns and how it behaves. However, Burnett (2009) argued that the holistic paradigm might be a challenge in selecting a suitable unit of analysis. As a result, an enhanced version of holistic research paradigm was introduced by scholars (Rebernik & Mulej, 2000); named as a requisite holism research paradigm. The updated holistic approach suggests that only necessary and relevant elements of the system should be addressed without affecting the whole system or its environment to complete the big picture of the study. Table 14 summarised the three research paradigms in terms of research ontology, epistemology, and methodology perspectives:

Table 14: Comparison between the three research paradigms

Approach	Ontology	Epistemology	Methodology
Positivism	▪ Focuses on the specific external reality that consists of isolated elements.	▪ Findings are objective, value-free, and can be generalised. ▪ The researcher is an outside expert.	▪ Quantitative technique using structured methods such as questionnaires.
Social Constructionism	▪ Deals with reasons of people behaviour and their perceptions when explaining the phenomenon.	▪ Findings are subjective perceptions and meanings of actors. ▪ The researcher is an insider but follows an objective approach.	▪ A qualitative technique using semi-structured methods such as interviews.
Holistic Research	▪ Understanding a phenomenon based on a group of components that are integrated.	▪ Findings are both subjective and objective. ▪ The researcher is outside expert but considers subjective components.	▪ Mixed method technique using triangulation methods to collect and analyse the data.

4.2.1 Research Paradigms in the Business Incubation Studies

Considering different types of incubators and its associated success factors based on its objectives, scholars followed different research paradigms to achieve their study objectives. Thus, some studies adopted the requisite holism paradigm, which allows studying specific parts of the entrepreneurial characteristics under the whole system of an incubator. However, such paradigm will influence the role of the researcher that entails using mixed methodology by combining his/her position as an outside expert but in the same time considers his/her involvement by interpreting the discovered reality subjectively.

In this regard, McAdam (2004) finds it difficult to adopt positivist paradigm in entrepreneurial studies as it segregates the expert researcher than the discovered reality, also, the researcher found it challenging to interpret the perceptions of entrepreneurs towards certain phenomena. Therefore, in order to contribute effectively to the body of knowledge in business incubation studies, McAdam (2004) adopted social constructivism qualitative paradigm to understand and interpret the role of entrepreneurial networking and its internal and external impacts under the incubation environment.

In another study conducted in South Africa, Sithole and Rugimbana (2014) suggested a framework for the enabling factors that impact the graduation of new technology-based firms from the university-based incubators. The researchers adopted a mixed methods technique on multiple cases at university-based incubators by using semi-structured interviews. Thus, the researchers followed pragmatic paradigm in order to deal with both qualitative and quantitative methods. In another research case, Sithole and Rugimbana (2014) justified the adoption of mixed method approach due to its efficiency to achieve the study objectives by capturing the trends from different sources.

Burnett (2009) followed somehow the same approach but moving from holistic to a requisite holism paradigm. The researcher intended to investigate how incubator managers may play a dual role in managing the incubator as well as the incubation process. The researcher supported previous scholars by applying a holism paradigm on entrepreneurship studies as it has many associated variables that need to be considered, particularly the behaviour of entrepreneurs, which cannot depend on positivism research paradigm to analyse their behavioural trends. However, due to this

complexity, the researcher adopted a more specific focused paradigm (Requisite Holism) in order to examine selected components based on study objectives, but without affecting the whole system (incubator).

Finally, in a study conducted to explore how the learning is taking place within incubatees at incubators in the UK, Meckel (2014) followed a social constructionism paradigm to balance between the interpretive data generated from individuals to understand the meanings, and the objective data generated from practices around the investigated issue. However, social constructionism is considered associated with the qualitative methodology but with a logic selection of interpretive data to describe the investigated phenomena.

4.2.2 The Adopted Research Paradigms

As discussed earlier, in social sciences, there are two most accepted research paradigms among scholars, these are i) positivism paradigm using quantitative methodologies, and ii) the constructivism paradigm using qualitative methodologies. Due to the inconsistency of their ontological assumptions as well as their data collection and analysis method, scholars advocated for the need of third research paradigm in which both can agree on ontological assumptions (Heath, 1992). Therefore, a holistic research paradigm has been adopted by some scholars in the social sciences in general and business incubation in particular (McAdam, 2004). Thus, following the research paradigms implemented by above studies, a requisite holism research paradigm is adopted in this study by addressing certain factors in the real world that are expected to affect the success of business incubators in the UAE.

As far as researcher's stance in terms of the relationship with the examined study, the researcher is an "outsider" from the investigated study (incubators in the UAE) but playing the role of "expert" based on sufficient previous knowledge and experience in business incubation field. Moreover, this research is conducted "for people" as the researcher act as a consultant in which the study findings can generate new knowledge that may benefit the stakeholders of business incubation in the UAE in general and the incubators in particular.

4.3 Research Strategy

To have a coherent research structure, an appropriate research strategy should be adopted based on the research objectives and research questions. A research strategy should help in to achieve the study objectives by providing guidelines, steps, and valid tools. Determining a suitable research strategy in the social sciences has always been under debate by scholars. Concerning the present study, this thesis is social science research, particularly research in management that focuses on the effectiveness of incubation in the UAE. Therefore, the research targets the stakeholders of incubators in order to get their insights and views based on their actual experiences on the critical success factors that may affect the incubators, and how they are supporting the socio-economic development objectives in the UAE.

On the other hand, the procedure of answering the research questions are essential, which requires justified steps in the research strategy exercise. In this regard, Blaikie (2007) divided the research strategy into four types that each study should fall under one of the followings:

i] *Inductive*: The inductive research strategy seeks to generalise patterns based on the accumulated and logical sequence of data collection and analysis. The

patterns can be further tested to support their situations by determining its characteristics. In order to discover the characteristics of social patterns, the inductive research strategy supports the research questions in term of answering the "what" questions more than the "why" questions.

ii] *Deductive*: In contrast, the deductive research strategy aims to understand generalised and discovered patterns. In order to build an explanation around a discovered pattern, and after analysing the data, a theory or a model is tested through hypothesis in which it either validates the theory (hypothesis is accepted) or modifies the theory (hypothesis is rejected). Therefore, the deductive research strategy is appropriate for addressing the "*why*" questions in order to answer the basis behind the existed patterns.

iii] *Retroductive*: The retroductive strategy follows the deductive strategy in principle, but it has its approach in seeking a different kind of explanation of the established phenomenon. The retroductive strategy is achieved by a hypothetical model that is responsible for causing the phenomenon. The proposed hypothetical model (the mechanism) is built based on similar patterns that were observed in other studies and then modified based on the researcher's experience to match the current phenomenon. The mechanism is then tested to generate structured explanations about the observed phenomenon. Thus, the retroductive strategy addresses the research questions by answering the "why" questions differently based on a mechanism that constructed the pattern.

iv] *Abductive*: The abductive research strategy focuses on understanding the tacit knowledge of participants' social world, how it is constructed, and their motives to produce scientific explanations of social reality. This strategy requires the researcher to be deeply involved in the investigated phenomenon

and supported by his/her perception, as well as the ability to interpret the reasons for constructing the phenomenon.

4.3.1 Research Strategies in the Business Incubators Studies

Selecting a suitable research strategy is referred to how the research needs to be conducted based on the research objectives. With regards to business incubation studies, there are few research studies discussed the strategies used to conduct their research, particularly in the GCC region. In this regard, a study conducted by Alsheikh (2009) to develop a set of conditions to establish successful incubators in Saudi Arabia. The researcher adopted a research approach that comprises of three following stages; focus group interviews with experts in business incubation field, targeted questionnaires, and a case study on the existed business incubator.

Based on his research objectives, the researcher followed two research strategies:

i] The deductive strategy to collect and analyse secondary data from previous studies in order to identify the general conditions and measures of business incubations' success.

ii] The inductive strategy to collect primary data from focus group interviews, surveys, and case study in order to analyse the success conditions of business incubators in Saudi Arabia.

Thus, based on the nature of each study and its objectives, adopting a particular strategy in one case may not be suitable for another. Therefore, each research study has to justify its strategy and apply a suitable research methodology and associated research methods for it.

4.3.2 The Adopted Research Strategy

In the domain of realism and holistic research paradigms, studies are usually exploratory and descriptive (Burnett, 2009). They start with literature reviews in previous studies to explore components of the desired phenomenon, and they describe their features, impacts, and behaviours to further expand in the knowledge. In this study, due to the limited active operators of incubators in the UAE, the study needs to consider all of them within this study by targeting different their stakeholders such as the incubation management, incubated entrepreneurs, and their mentors. As such, this study has almost the same case; it has exploratory and descriptive research in nature as it tries to discover the elements of incubators' success; also, it tries to describe certain reality by understanding those elements that are identified within the UAE domain. This is also applied to the roles of business incubators in the UAE.

Thus, based on presented research strategies, this study will follow the deductive research strategy in order to achieve the research objectives. Certain selected challenges have been identified and justified theoretically through reviewing extant related literature released by different countries; particularly, the GCC region. Nevertheless, to achieve the research objectives, this study reflected the proposed challenges into a developed conceptual framework (mechanism) to understand how business incubators (the phenomenon) are likely going to succeed in the UAE and what is their expected roles in the country. The conceptual framework will be tested and analysed through suitable research methods in order to develop a structured framework of business incubators' success in the UAE. As the deductive research strategy suggests an explanatory mechanism, this study follows the top-down approach through the proposed mechanism.

4.4 Research Methodology

Selecting a suitable research methodology is a critical stage which defines how the research should be conducted in terms of the procedural steps. In other words, the research methodology gives a roadmap for the researcher to design the research and collect the needed data. Research methodology is defined as one of the three components of the research paradigm (Guba & Lincoln, 1994). The remaining components of our ontology and epistemology. As far as research methodology's concern, there are three types of methodologies that a researcher might select, namely: quantitative, qualitative, and mixed methodology, as detailed below:

i] *Quantitative Methodology*: The researchers aim to measure observations related to practice and perception of human in order to generalise conclusions. To achieve that, quantitative methodology practitioners usually adopt statistical tools such as questionnaires to collect and analyse data, and they also follow standard procedures for reliability and validity purposes related to verification of theories applied, variables used, and their relationships (Saunders, Lewis, & Thornhill (2000).

ii] *Qualitative Methodology*: The researchers seek to focus on investigating a particular situation and how it is constructed and why it happened in order to understand the problem (Leedy & Ormrod, 2005). To realise that, qualitative methodology adopters generally use interviews with open-ended questions to collect and analyse complex data in order to understand their meaning, and then report it in an interpretive manner (Creswell, Plano Clark, Gutmann, & Hanson, 2003).

iii] *Mix Methodology*: The researchers integrate both quantitative and qualitative methodologies into one. This approach is considered as a complicated

methodology to adopt as it requires experience in both approaches, as well as time to be allocated. The reason behind this difficulty is that mixed methodology entails collecting text data as well as numerical data using different types of tools (such as questionnaires and interviews), and then analysing them in particular order, which depends on social problem that is being investigated (Creswell, Plano Clark, Gutmann, & Hanson, 2003).

In summary, it is worth mentioning that qualitative methodology is attached with social constructionism research paradigm, while the quantitative approach is associated with positivism research paradigm. Table 15 sheds light on each research methodology in term of its respective objective, characteristics, the method used, challenges, and outcomes.

Table 15: Comparison between the three research methodologies

Aspect	Quantitative	Qualitative	Mixed
Objective	Seeks to generalise phenomenon based on measurable observations	Understand a phenomenon through a holistic analysis	Combines understanding the phenomenon as well as generalise behaviours
Strength	Can be applied to a wide range of situations	Can understand peoples' meaning and motives in a certain situation	Can capture people's behaviour and perception as well as their reasons
Method Used	Statistical and numeric tools such as questionnaires	Narrative and interpretive tools, such as interviews	A mix of both tools depends on the problem under investigation

Table 15: Comparison between the three research methodologies (Continued)

Aspect	Quantitative	Qualitative	Mixed
Challenges	Do not cater for understanding the motives and detach people from their actions	Limited guidelines to be benchmarked and the reality cannot always be generalised	Requires more time, experience, and efforts
Outcomes	Discover the knowledge	Build the knowledge	Mix of both

Thus, each researcher seeks to select a suitable methodology in which it enables the researcher to achieve the study objectives. However, such selection is determined by several factors such as the nature of the research problem, the personal experience of the researcher, the previous related studies, and the beneficiaries of the research outcomes.

4.4.1 Research Methodologies in Business Incubation Studies

Many scholars around the world have researched business incubation covering different aspects such as evaluating the performance of incubators and assessing their contributions. Accordingly, a suitable research methodology has to be developed in order to address the research questions. In Table 16, a set of research questions were summarised based on some of the incubation studies:

Table 16: Some research questions proposed by scholars in incubation research fields

Author (1)	Burnett (2009)
Research Objectives	Investigating how incubator managers may play a dual role in managing the incubator as well as the incubation process in Australia.
Research Questions	▪ What are the parameters for optimum sponsorship and funding of Australian, not- for-profit incubators? ▪ What are the main challenges faced by BI managers in Australian incubators?

Table 16: Some research questions proposed by scholars in incubation research fields (Continued)

Author (2)	Whitt (2014)
Research Objectives	Investigating the correlation of eight entrepreneurial factors with the incubators' return on investment.
Research Questions	▪ How does the facilitation of client accesses in business incubators as perceived by the CEO's of the client firms relate to the profitability of those client firms? ▪ How do the entrepreneurial clients participating in the business incubator model view the level of these accesses as provided within their particular incubator? ▪ How does the viewed level of these accesses relate to the profitability and sustainability levels of the enterprise of these client firms?
Author (3)	Hires (2010)
Research Objectives	Assessing the incubators' impact on economic development in the state of Louisiana, USA.
Research Questions	▪ What kind of organisational structure enables the best performance of an incubator? ▪ What kind of management programme enables the best performance of an incubator? ▪ Compared with criteria provided from national performance assessments, how are the business incubators in the state of Louisiana performing? ▪ What factors particularly influence the ways that business incubators in the state of Louisiana have had an economic development impact?
Author (4)	Lish (2012)
Research Objectives	Developing a conceptual incubator model effectiveness using theoretical antecedents.
Research Questions	▪ Do the physical characteristics of an incubator (i.e., office space, shared office equipment or services) contribute to incubator effectiveness? ▪ Does the time spent by incubator managers and staff intervening with the client company contribute to incubator effectiveness? ▪ What are the resources necessary for incubator effectiveness? ▪ Does the screening and selection of clients contribute to incubator effectiveness? ▪ Does business training contribute to incubator effectiveness?

Table 16: Some research questions proposed by scholars in incubation research fields (Continued)

Author (5)	Kamdar (2012)
Research Objectives	Investigating the role of business incubation centres in promoting entrepreneurship in the Indian context.
Research Questions	▪ What particular services do business incubation centres provide to entrepreneurs? ▪ Are there any gaps between the perceived and actual services rendered? ▪ What practices are followed by incubation centres to promote entrepreneurship? ▪ How can they be made more effective in fulfilling their role in promoting entrepreneurship?
Author (6)	Sherman (1999)
Research Objectives	Examining the effectiveness of business incubation programs on helping start-up businesses to survive and grow.
Research Questions	1) What is the average number of jobs created by incubated firms? 2) What is the estimated return on the public investment in incubation programs? 3) What is the average growth of tenant firms in terms of sales? Capital, investments, profits, and annual payroll? 4) What is the perception of stakeholders regarding the value of the incubation program to the success of their tenants?
Author (7)	Verma (2004)
Research Objectives	Investigating the effectiveness of business incubators in improving the survival rates of start-up businesses.
Research Questions	1) What factors affect the performance (success) of business incubators in Canada?

Thus, due to the different research objectives of the investigated issue, scholars used different research methodologies in business incubation studies. Kamdar (2012) conducted a general review of methodologies applied to business incubation studies. The researcher found that those studies were either exploratory or descriptive and

mostly applying questionnaires or case study methods. Kamdar (2012) revealed that the quantitative studies used survey methods to analyse numeric data in order to compare findings and generalise results, while the qualitative studies used case study method in order to extract best practices through narrative interpretations of successful incubators around the world.

The main challenge faced quantitative methodology adopters is finding a sufficient sample size for analysing their data, while the quantitative methodology adopters faced the challenge of finding sufficient guidelines to be followed. However, in both cases, the researcher stressed the critical role of incubation managers; as the main channel of information related to the study. In contrast, Meckel (2014) investigated the procedure in which entrepreneurs at incubators learn and acquire the know-how to develop their start-up businesses in the United Kingdom. The researcher aimed to collect live experiences of incubated entrepreneurs. Therefore, he followed a qualitative methodology by drawing information using in-depth interviews with selected incubated entrepreneurs. Based on the collected data and analysis, Meckel (2014) succeeded to identify and develop pathways of learning by incubated entrepreneurs through the incubation process.

In a different opinion, Burnett (2009) advocated for the adoption of mixed methodologies in a single study to overcome the inefficiency of a single method, and therefore, enhance the research validation process. Thus, the researcher used mixed methods by using interviews, cases studies, and questionnaire technique to address the challenges of supporting incubated entrepreneurs by incubation managers while operating an incubator in Australia. In the GCC region, it was noticed that almost all of Al-Mubarak's research papers (e.g., Al-Mubaraki & Busler, 2015; AL-Mubaraki &

Busler, 2014; Al-Mubaraki & Busler, 2012; Al-Mubaraki & Wong, 2011, May; Al-Mubarak & Busler, 2010) were either desk review or case study approach.

Alsheikh (2009) examined the availability of factors to introduce business incubation concept in Saudi Arabia. To achieve his study objectives, the researcher adopted a mixed methodology approach using a triangulation technique. Alsheikh (2009) implemented a sequential approach to collect his data by starting with focus group interviews with Saudi expertise, followed by conducting couple surveys, and ended with a single case study on the first business incubator launched in Saudi Arabia.

The researcher argued that applying a combination of different research methods in the same study might enhance the validity of research outcomes, as well as it may support the knowledge generated out of each applied research technique. Similarly, Elmansori (2014) conducted a comparison study between Jordan and the UAE aiming to examine how entrepreneurs are supported in both countries through business incubators. The researcher followed also a mixed methodology approach using survey and interview approaches to achieve the research objectives.

4.4.2 The Adopted Research Methodology

It is noticed from previous research studies that identifying an appropriate research methodology for business incubation studies have been under continuous debate by scholars. Depending on the nature of the study and its objectives, scholars may adopt qualitative research method such as focus group and interview techniques, while adopters of quantitative research method may apply different types of surveys. Although most of the scholars have adopted either a quantitative or qualitative

approach, adopting mixed methodology has recently started to gain acceptance by scholars to address the research problem.

Thus, building on the above-related studies, and in order to achieve the research objectives and answer the research questions, this study will follow a mixed methodology for the following reasons:

i] This research requires collecting information from a different population (stakeholders of business incubators in the UAE) to achieve the research objectives. As such, each targeted population is required to provide a different set of information that cannot be unified under one research method. In this regard, an interview method is applied for identifying the critical success factors of business incubation, their roles, and how they are affecting on incubators' performance, while the survey method is applied to generalize the findings on the internal and external success factors of business incubation as well as their expected roles in the UAE.

ii] Applying mix methodologies is aligned with the nature of this research. In the first part the research, it has an exploratory nature in order to develop some subjective knowledge related to the success factors of business incubators and their expected roles in the UAE based on the views of subject matter experts, while in the second part of the research, it is a descriptive-based research in order to build objective knowledge related to describing external and internal factors of business incubators and their level of influence as well as their roles at micro and macro level.

iii] As the first part of the study is exploratory research, the interview outcomes, which serves the second research objective, will help in building the survey

questionnaire that is used to achieve the third and fourth research objectives. By doing so, the analysis would help in validating the findings concerning the proposed success factors and roles of business incubation and their level of influence in the UAE.

iv] A mixed methodology is applied in this study in order to overcome the limited, targeted population (business incubation management as well as from incubated entrepreneurs) in the UAE, therefore, avoiding the risk of low response rate on the survey questionnaire from both categories in which it cannot generalise the study findings. Therefore, a qualitative method using interview approach is applied on five categories of business incubators stakeholders to understand what it takes for business incubators to succeed in the UAE and able to support the country's plans in promoting entrepreneurship practices.

Based on the justification above, this thesis will adopt mixed methodologies in which both quantitative and qualitative methods will be inserted in the research design.

4.5 Study Design

The previous section justified using mix methodologies to capture objective and subjective knowledge related to the success of business incubators and their expected roles in the UAE. This section will propose a design for conducting the study. The proposed research design in this thesis followed to a certain degree a combination of Burnett (2009), Alsheikh (2009), and Elmansori (2015) studies in terms of research paradigm (requisite holism), research strategy (deductive), research methodology (mix methodologies), and research methods applied (survey questionnaire and interview techniques). However, this study varies than other previous business incubation

studies in proposing a conceptual framework of business incubation's success with some unique success factors that are related to the UAE domain.

The research design of this study is divided into three phases to collect and analyse the data. The first step starts with collecting and analysing secondary data to build a base of objective knowledge concerning business incubation with a particular focus on the GCC region in general and the UAE in particular. Besides, the secondary data seeks to collect all relevant factors that may influence incubations' success. By doing so, a conceptual framework of business incubation and their suggested roles in the UAE. In the second phase of collecting the data, the primary data will be collected using semi-structured interviews with the stakeholders of business incubators to develop a subjective knowledge about the success factors and the expected roles of business incubators in the UAE.

Finally, in the third phase of the data collection exercise, a primary data will be collected using combined survey to define the meaning of incubations' success, describe the internal and the external factors affecting the success of business incubators, and examining the expected roles of business incubators in the UAE. The following sections will elaborate on those steps in more details.

4.5.1 Achieving the First Research Objective

Over the last thirty years, studies conducted on business incubation covered different dimensions using different methodologies. The first research objective of this thesis is concerned with discussing the latest literature reviews and industry reports on business incubation in the GCC region and the UAE in particular. Therefore, in order to achieve the first research objective, this study needs to collect information from academic

literature and industry reports as well as international indexes such as Global Innovation Index as a secondary data. Secondary data are a set of information that can be used either to achieve the research objectives or at least to support the primary data collected using the appropriate method.

According to Ghauri and Grønhaug (2005), secondary data are information available in different forms and at different sources, which can be extracted and utilised based on the researchers' needs. Therefore, the secondary data will be using the electronic library of UAE University as well as government and private related websites. Also, special attention will be given to success factors that may support business incubators, as well as the roles of incubators in supporting the socio-economic strategies, with a particular focus on promoting entrepreneurship practices.

As such, the term "success factors" and "roles" will be associated with "business incubator" while searching for secondary data. Furthermore, the secondary data will be collected from the following sources:

- The Global Innovation Index – UAE Chapter
- Academic literature, E-library, UAE University
- www.wamda.com
- Khalifa Fund for Enterprise Development
- Dubai SME
- Global Entrepreneurship Monitor Report – UAE Chapter

In this regard, Ghauri and Grønhaug (2005) supported diversifying the sources of secondary data to support the research objectives. The researchers agreed with obtaining secondary data from government, universities, and private consulting entities, while the accuracy and reliability of sources are maintained. Also, Meckel

(2014) highlighted the benefits gained by the researcher in his/her views towards the investigated phenomena based on the secondary data, particularly in his/her research approach and scope, which will be reflected in the method of collecting primary data. Moreover, assuming the researcher is working within the business incubation field, the researcher will benefit from the secondary data for his/her professional experience.

Thus, to better organise and analyse the secondary data collected from different sources, the structure of literature review chapter has been being divided into three stages, which are business incubation concept with its associated dimensions, business incubation in the GCC region, and then business incubation in the UAE. However, special attention will be given to entrepreneurship status while reviewing the literature within the UAE domain (See Figure 1).

4.5.2 Achieving the Second Research Objective

The second research objective seeks to explore the success factors of business incubators in the UAE. Also, the second research objective aims to examine the roles of business incubators in supporting the UAE's strategic objectives in general and entrepreneurship practices in particular. Therefore, to achieve the second research objective, information from sources that represents direct stakeholders of business incubators in the UAE needs to be collected, which will be discussed in the collecting primary data section using a suitable data collection method and how the selected method is developed and tested.

4.5.3 Achieving Third and Fourth Research Objectives

The third and fourth research objectives seek to describe the internal and external factors that may influence the success of incubators in the UAE. Therefore, the

perception of the two categories of business incubators' stakeholders (incubation management and incubated entrepreneurs) needs to be collected. Consequently, collecting primary data will be discussed using a suitable data collection method and how the selected method is developed and tested.

4.6 Collecting Primary Data

Primary data are original data that is collected by the researcher based on the nature of the problem that is being investigated. The primary data could be in many forms such as experiments, interviews, and questionnaires that can be collected and then analysed (Burnett, 2009). In this study, the objective of collecting primary data is mainly to overcome the shortage of literature and industry reports written about the critical factors that may influence the success of incubators as well as their roles in the UAE domain.

Thus, the effort of collecting primary data directly from the affected bodies as well as beneficiaries out of incubators will be highly valuable. However, although the national innovation strategy of UAE (2014) have considered business incubators as one of the enablers for supporting the strategy, and according to our knowledge, there was no study conducted in the last four years to investigate the impact of incubators in the UAE. Therefore, it is critical to collect insights from the related stakeholders in order to identify the success factors and the roles of incubators in the UAE at the micro and macro level.

4.6.1 Qualitative Data Collection Method Using Interview Approach

As mentioned in the previous section, an in-depth data collection method is needed to develop subjective knowledge for covering the two dimensions of the research

objective. In the first dimension, it is assumed that each stakeholder of business incubators knows what is needed (from his relationship) for incubators to succeed. Therefore, collecting primary data from relevant stakeholders through using interview approach would be combining and integrating various views of stakeholders to achieve the second research objective. In addition, the interview approach requires interaction with interviewees in order to gain in-depth understanding of business incubation practices in the UAE, which entails covering different dimensions of business incubation related to their perception of success, enabling success factors, how it is measured, roles, and benefits gained by the government and entrepreneurs in the UAE.

Moreover, such data requires collecting subjective knowledge that investigates the reasons for the existence of such critical factors, as well as the motives of incubators to promote entrepreneurship practices. In this regard, Alsheikh (2009) adopted a qualitative data collection method using a case study technique targeting the oldest incubator in Saudi Arabia (Jeddah Business Incubator). In his study, the researcher investigated how the incubator promoted the survived SMEs by interviewing their clients in order to understand the roles.

Similarly, Burnett (2009) argued that the interview method gives more focus on understanding the investigated phenomena comparing to surveys that provide general statistical analysis. In her study, the researcher adopted the interview method to gain in-depth knowledge from incubator managers to understand their motives toward supporting incubated tenants while satisfying incubators' sponsors. Finally, Meckel (2014) followed also qualitative research approach using the interview method to investigate how a combination of information, experience, and skills may generate new knowledge for incubated entrepreneurs during the incubation cycle.

Thus, the scholars widely used interview technique in different fields to address the relationship between the activities with their natural settings using “why” and “how” questions. Therefore, the interview approach will be a useful technique to extract subjective knowledge when addressing the incubated entrepreneurs’ concern while they are impacted with the activities of business incubators in the UAE and how they are influencing their performance. Therefore, in order to achieve the second part of the second research objective, this study will adopt a qualitative data collection method using an interview technique.

4.6.1.1 The Interview Technique

One of the most common data collection technique used for collecting qualitative data is an interview method. This technique entails real interaction between the researcher and the respondent (Ghauri & Grønhaug, 2005). According to Johnson and Turner (2003), interviews can be purely qualitative using the unstructured method, quantitative using the structured method, or a mix of both using the semi-structured method. However, applying unstructured or semi-structured interviews requires greater experience by the researcher comparing to structured interviews. Also, in the structured interviews, all the questions are closed-ended, which are pre-planned, while in the case of unstructured interviews, all the questions are open-ended, which will be directed based on the interaction between the interviewer and the interviewee (Johnson & Turner, 2003). Moreover, interviews can be conducted either via telephone or in person. Each type and method may have its advantages and disadvantages.

In the case of semi-structured interviews, the questions are guided by the area of interest that may be discussed thoroughly in specific questions, which might require further interpretations and descriptions. Burnett (2009) applied semi-structured

interviews as a primary tool of collecting data about the perception of incubators' managers in Australia, while Alsheikh (2009) adopted an interview technique on the management of Jeddah incubator to understand better their experiences after conducting an initial survey. The researcher applied a semi-structured interview by giving options of topics for respondents to discuss and share their views. Similarly, Elmansori (2014) followed semi-structured interviews on twelve experts in the SME field to explore how incubators could be established in the Arab world.

As such, building on the related business incubation studies conducted worldwide (Burnett, 2009; Meckel, 2014), and within the region (Alsheikh, 2009; Elmansori, 2014), this thesis will adopt a semi-structured interview to achieve the second research objective. Thus, it is expected that the outcomes generated from those interviews will identify the perception of business incubations' success, key success factors of business incubation, and their expected roles in the UAE. However, some boundaries around the questions will be kept in order to control the discuss dimension. In this regard, Burnett (2009) developed interview guidelines for her interview sessions as follows:

- A brief introduction with building a connection to the research question
- An assessment of the current situation
- An identification of problems and challenges
- Finding solutions.

4.6.1.2 The Development of Interview Questions

The proposed interview questions covered three dimensions, which addresses the research questions of the study; these were:

- The perception of business incubations' success

- The factors affecting the performance of business incubators
- The benefits gained from business incubators.

The interview questions were designed based on the studies of Alsheikh (2009), Burnett (2009), Elmansori (2014), and Meckel (2014). Following the introductory message about the study objectives and interview protocol, the structure of the interview questions is divided into three sections; interviewee details, business incubation' success in the UAE, and the roles of incubators in the UAE. The structure of the questions is developed in a way that should not take more than one-hour using open-ended questions.

In the introduction message, the researcher intends to provide a brief description about the study purpose, in general and the interview in particular. Also, some interview protocol is introduced, such as interruption when the discussion deviates from the questions. Moreover, voice recording was used to make sure that all required data are collected and transcribed adequately. In the first part of the interview questions was targeted to the personal profile of the interviewees, such as their academic qualification and professional experience with business incubation. In the second part of the interview, the interviewee will be asked five questions related to their perception of incubations' success, how the success should be measured, and the critical success factors of business incubators in the UAE. In the third part, the interviewee will be given two questions concerning the roles of business incubators in the UAE at the micro and macro level.

Thus, the expected feedback from interview questions aims to gather insights and details beyond simple responses in the form of scales or closed questions. The proposed approach will encourage the interviewees to engage and participate

effectively and provide useful insights that can be beneficial for the study. By doing so, this will help relating all the responses to the elements of the proposed framework of the business incubation in the UAE. On another hand, the outcomes of the interviews will support achieving the third and fourth research objectives by describing the nature of each success factor of the business incubator as well as the dimensions of impact that are expected from business incubators in the UAE.

4.6.1.3 Selection of Interviewees

To gain valuable feedback from reliable sources, some suitable candidates that are representing the stakeholders of incubators in the UAE need to be targeted. Thus, following the approach of Alsheikh (2009), Burnett (2009), Michel (2014), and Elmansori (2014) in selecting their candidates for their interviews based on defined criteria, this study will apply criteria for selecting the interviewees to be nominated in the interviews. As such, the criteria for selecting candidates is based on sufficient experience dealing with business incubators, and being within the following stakeholders of business incubation in the UAE:

- **Managers of business incubation**: the ones that are in charge of day-to-day operation of an incubator and responsible for achieving its objectives, which should be from one of the business incubators that are active in the UAE.
- **Mentors in business incubation**: the ones that are in charge of giving the necessary support for incubated entrepreneurs and start-ups to increase the chance of their success during the incubation cycle
- **Start-ups Investors deal with business incubation**: the ones that are working directly with active business incubators in the UAE, particularly for funding incubated entrepreneurs and start-ups at the incubator.

- **Incubated Entrepreneurs/Start-ups**: the ones that are currently incubated or just recently graduated from the incubation cycle, which should be from one of the business incubators that are active in the UAE.
- **Government entities deal with business incubators:** the ones that are in charge of supporting business incubators in the UAE in terms of funding, or legislating, sourcing, developing entrepreneurs, or sponsoring incubators.

4.6.1.4 Conducting Pilot Interviews

Two preliminary interviews were piloted in order to test the interview questions in terms of the phrasing of the questions and the clarity of the questions. Also, the two pilot interviews aimed at testing the value of each question and their sequence. The questions were put in particular order to help the interviewees discussing issues related to the perception of incubation's success, factors affecting the success, and the roles of incubators in the UAE. The two pilot interviews were conducted with two professionals that have professional experience with business incubators in the UAE. The two participants were qualified as per the criteria developed for selecting the interviewees. The professional relationship of the researcher helped in starting the interviews with them.

The two interviews took between 35 to 40 minutes to be concluded. Based on the outcomes of the two pilot interviews, the following changes have been made on the interview questions (see the final version of the interview questions in Appendix IV):

- The introductory paragraph of the interview was simplified in order to make it short by providing the objectives of the interview and how it will be conducted.
- The interview questions were divided into three sections (interviewee details, business incubation success, and the roles of business incubators in the UAE)

in order to organise the feedback of respondents and make the interviewees more focused at each section.

- In the last section (roles of business incubators), the three proposed questions were merged into two different questions based on the responses of two interviewees. The reason is that the first question (What are the expected roles of business incubators in the UAE from your perspective?) is quite similar to the following questions (what benefits business incubators can provide for the UAE? and what benefits can business incubators provide for their incubated entrepreneurs?). Thus, to make a clear distinction between the questions, the last section kept only two questions while keeping the desired outcomes of the section.
- Few words in the questions were replaced in order to make them understandable.

The outcomes of the pilot interviews provided some interesting insights related to factors that are currently affecting the success of incubators in the UAE such as the type of government support needed by the incubators. Also, the pilot interviews expected specific roles from incubators that may promote entrepreneurship practices in the country such as nurturing entrepreneurs by exposing them with real-life experiences of establishing business ventures and how to sustain it in the open market.

4.6.1.5 Interview Analysis Approach

All the data collected from the interview sessions were transcribed into separate twenty-five files, which was saved in word document format. However, analysing such large data might be a challenge if not correctly processed. In this regard, when studying how learning takes place at incubators, Meckel (2014) suggested applying thematic

analysis approach when analysing qualitative data to build themes of the data and organise them into categories to be discussed more efficiently. Elmansori (2014) also followed the thematic analysis when analysing the views of experts with regards to incubation' success due to its advantage in understanding more background and organising the insights into groups.

Thus, building on the above two studies, this research will adopt a thematic analysis to transform the qualitative data into meaningful findings. The study will process the data by categorising them based on the success factors, which was suggested in the conceptual framework of business incubation in the UAE. This would enable the researcher to discuss the findings in several stages and then summarise it collectively. However, the researcher did not depend on any software for analysing the data. Although the manual approach might take more time comparing to using software for analysis, the researcher wanted to capture all the insights from the twenty-five experts manually to be familiarised with collected qualitative data, and therefore, be able to discuss better the findings as well as grasp personal knowledge out of that collected information.

To manage the massive data collected from twenty-five experts; therefore, the data analysis exercise is going through the following processes:

i] Read the transcripts and go through all are captured answers for the 25 interviews.

ii] Distribute the insights mentioned by the experts into four Tables related to:

- The perception of incubation's success.
- The critical success factors for business incubators in the UAE.
- The key measures of incubation's success.

- The roles of business incubation at the macro level and micro level.
- Collect all insights based on its relation to success factors.
- Connect those factors set into each other, whether they are internal or external.

iii] Categorise those insights into groups (success factors) based on their relevance to each other using the factors suggested in the UAE incubation framework.

These stages of data analysis were carried out in order to transform complex data into meaningful findings. Thus, following the analysis approach used by Meckel (2014) when coding the insights, this study will depend on the conceptual framework of incubations' success in the UAE to build its codes, as follows:

i] The Success of Business Incubation in the UAE as (e.g., graduating entrepreneurs, creating start-up companies, sustaining incubated entrepreneurs in the market)

ii] The Success factors of business incubation in the UAE:

- *Government Support* (e.g., policies, incentives, IP services, access to funds)
- *Financial Resources* (e.g., government funds, private sector, funds, sponsorship, venture capital funds, banks loans, R&D funds at universities)
- *Market Conditions* (e.g., respective government entities, universities and research centres, respective industry developers and customers)
- *Entrepreneurship Culture* (e.g., novelty of ideas, risk-taking, identifying future opportunities, willingness to be incubated)
- *Infrastructure* (e.g., facilities and services management, entry and exit criteria, contract of incubated clients, progress criteria).

- *Networking* (e.g., information sources, expertise in targeted fields, fund sources, targeted customers)
- *Human Resources* (e.g., qualification of the management team, qualification and experience of the technical team, experience of the management team)
- *Commercialisation Conditions* (e.g., generating and assessing entrepreneurial ideas, testing concepts/assessing the feasibility of new products & services, supporting start-up creation.

iii] The roles of business incubation in the UAE:

- *At the micro level* (e.g., nurturing entrepreneurs, creating jobs, commercialising new products/services).
- *At the macro level* (e.g., developing entrepreneurship culture, contributing to the local economy, supporting national innovation strategy).

In the following Section, the results are presented in Tables to summarise the answers of interview questions. This illustration of data could facilitate the progress of data analysis and discussion while relating the insights to either incubators' success or its roles in the UAE.

4.6.2 Quantitative Data Collection Using Survey Questionnaire Approach

In this study, the last three research questions are associated with third and fourth research objectives, which seeks to identify the actual factors affecting the success of incubators and examine their roles in the UAE. Also, descriptive research requires a suitable data collection method in which the data can be consistent in terms of responses and free from narrative interpretations in order to collect objective

knowledge. Therefore, this study will be using quantitative research technique, particularly a survey method to achieve the third and fourth research objectives.

Achieving the third and fourth research objectives requires collecting primary data from sources (business incubators in the UAE) and then to be analysed and discussed. Although the primary data is more reliable and has higher validity comparing with secondary data, it has its challenges in terms of time consumption, knowledge about tools used, implementation of those tools, and their respective analysis. Also, due to descriptive nature of the third and fourth research objectives, this study requires a quantitative research method to describe the effect of proposed factors, which was identified through the literature reviews and the outcomes of the interviews conducted with expertise in business incubation field.

4.6.2.1 Collecting Primary Data

A questionnaire survey method was employed to achieve the third and fourth research objectives through extracting the needed data from sources related to some defined factors that might affect the success of incubators and the roles of those incubators in the UAE. Those factors may have attributed to external conditions such as market conditions, or internal conditions such as networking of the incubator in the UAE. On another hand, investigating the roles of incubation is expected to describe the explicit and implicit value of those incubators with regards to either supporting the country's strategic objectives or entrepreneurship practices in the UAE.

The questionnaire is selected to collect relevant information about external and internal factors affecting the success of incubators in the UAE. Also, the survey seeks to gather information related to incubations' outcomes in the UAE as well as their level of

success. The collected information is expected to validate the qualitative knowledge extracted in the second research objective. Once both sets of information are analysed collectively, it is expected to produce valuable and consistent objective knowledge, which can be useful for the stakeholders of business incubators in the UAE.

In this regard, several related studies applied a survey questionnaire to achieve their research objectives. Verma (2005) for instance, undertook quantitative research to collect primary data by using a structured questionnaire to rate the factors affecting the success of incubators in Canada. Kamdar (2012) followed the same approach to address the roles of incubators in promoting entrepreneurs in India. The researcher developed his survey based on the previously applied questionnaires while adjusting some questions and their scales to meet his research context.

In the GCC region, Alsheikh (2009) used a quantitative data collection method in the form of a survey targeting three different but relevant samples (small and medium enterprises, academics at universities, and university students). The researcher targeted those three groups to assess their awareness and readiness level for services offered by the incubators established in Saudi Arabia. Also, in the third step of his data collection exercise, Alsheikh (2009) applied a case study method using an updated version of the survey on incubated entrepreneurs at the Jeddah Business Incubator. The survey aimed to assess the effectiveness of incubator in terms of couple aspects such as legislative environment, the type of support offered, and funding.

The questionnaire survey targeted two different groups, which are; the management of incubators and the incubated entrepreneurs. The management of incubators is targeted because they are responsible for achieving the objectives of the incubators. In addition, they will be the most group that will be affected by those factors during the operation

of the incubators such as legislation imposed by the government. On the other hand, the performance of incubated entrepreneurs and start-ups will be affected by those enabling factors while they are going through the incubation cycle, especially when being challenged by the level of incubators' accessibility to customers or with the services offered by the incubator.

4.6.2.2 The Development of Survey Instrument

Cooper and Schindler (2003) described the survey questionnaire as an important communication tool between the researcher and the participants of research. Therefore, it is critical to making sure that such a tool is effective and efficient in terms of the words, measurements, and structure to maximise the quality of responses. As such, in order to achieve the third and fourth research objectives, a combined survey questionnaire has been developed as a tool for primary data collection from targeted groups (management of business incubators and incubated entrepreneurs).

The questions of the survey and their associated measurement scales have been developed based on the previous business incubation studies (Lish, 2012; Hires, 2010; Verma, 2005; Alsheikh, 2009). Also, to compare the responses of the two groups, the survey questionnaire will consist of some unified questions as well as some different questions. Moreover, few additional questions have been added that are unique to the UAE context. However, in order to check for the suitability of those questions in particular, and the overall questions in general, a reliability and validity analysis will be conducted and their measurement scales to meet the research standards.

The survey questionnaire consists of 24 questions divided into five parts, starting with the characteristics of an incubator, internal success factors, external success factors,

the success of an incubator, and the roles of business incubators in the UAE. In part one, the questions require specific responses to build some background about each incubator. In part two and three, the survey will apply a Likert-scale to rate the value of each factor and its importance in order to generate relatively highest and lowest scores. Part four seeks to define the success of incubators in the UAE. Finally, in part five, the objective is to identify the roles of business incubators in the country at the micro and macro level while using a Likert scale measure.

The questions that are targeting the incubated entrepreneurs; however, have their phrasing in order to fit their category. Also, considering the incubated entrepreneurs as the clients of the incubator, and going through the entrepreneurship life cycle, which ultimately will be exposed to different types of factors affecting their performance, the feedback of incubated entrepreneurs will be very critical to assess the value of each proposed factors and its associated parts. Finally, in order to avoid any ambiguous questions, several review sessions have been conducted with a research advisory committee to confirm the validity of the survey questionnaire.

4.6.2.3 Conducting a Pilot Survey

To assess the economic impact of incubators in the US, Hires (2010) recommended testing the survey through pilot studies and supported by some guidelines to avoid any future problems when analysing the data. Therefore, the survey needed to be piloted to test its validity and relevance to the research questions. During the primary collection method, Alsheikh (2009) tested ten responses for his survey at each target population for validating his questions, while Elmansori (2014) consulted with some experienced academics for reviewing and modifying his survey.

In this study, the survey was developed based on the third and fourth research objectives. This was followed by the review of the advisory committee of this study to check the relevance of the questions and the value of expected answers. Finally, the questionnaire was piloted at the incubator of the UAE University (UAEU Science and Innovation Park) for further assessment by actually related respondents. Thus, based on the feedback of the respondents, the following changes have been made:

i] The demographic questions were simplified in order to reduce the number of questions.

ii] The questions were divided into five parts with headlines for better engagement of respondents while answering the questions (profile, internal factors, external factors, the success of incubator, and the roles of the incubators in the UAE).

iii] Definitions for most important keywords have been developed and kept at the end of the questionnaire for reference.

iv] Few words in the questions were replaced in order to make it clear.

The pilot phase was helpful for testing the validity of the survey and making sure that the questions are not ambiguous. In the same time, be able to describe the importance of each factor for assessing the success of an incubator. Moreover, it describes role of the incubators in relation to the strategic directions of the country at macro level as well as in relation to entrepreneurial practices at micro level. Therefore, the revised version of the survey questionnaire in the UAE has been developed and is presented in Appendix (V).

4.6.2.4 Questionnaire Analysis Approach

The questionnaire survey targeted two categories of respondents as both of them are directly related to incubators' success. As such, the incubation was considered as a unit of analysis to address two relationships:

- Firstly, in order to describe the factors affecting their success in the UAE, the incubators will be considered as a dependent variable, while the eight enabling factors will be considered as independent factors.
- Secondly, to examine their roles in the UAE, incubators will be considered as independent factors, while six expected roles (three at the macro level and three at the micro level) will be considered as dependent factors.

The responses of the two targeted groups will be compared with each other, and therefore, confirm the validity of those factors and their nature of influence. Moreover, this study will use a survey technique on all active business incubators in the UAE (population) in order to identify their roles from the lens of management of incubators as well as the incubated entrepreneurs. To take a decision based on data analysis, the procedures of analysis should include a set of actions that can convert raw data into meaningful information (Zikmund & Carr, 2000).

The SPSS analysed the collected data from the survey questionnaire. Besides that some research hypotheses were proposed in Chapter-3 to be tested throughout this study. The hypotheses would evaluate the relationships of the eight enabling factors with the success of the incubators. As such, the following statistics generated by using SPSS to answer the research questions in order to achieve the research objectives:

i] *Descriptive Statistics*:

The descriptive statistics (means, standard deviations, frequencies, percentages, minimum, maximum, ranks, and independent samples t-test for equality of means at significant level (alpha = 0.050) would be calculated to answer the research questions as outlined in Chapter-1, while the results will be presented in tables in Chapter-5 (Data Collection and Analysis). Some tables represent the demographics results of investigated incubators, their management, and their clients, followed by the respondents' perception for each proposed success factor as well as the level of importance on each proposed role for business incubators from the lens of two categories of respondents. Thus, the descriptive statistical analysis will give indications about the effect of each success factor and the importance level for each proposed role expected by the business incubators in the UAE.

ii] *Factor Components Analysis* (PCA):

The factor analysis is conducted in this research in order to have a valid and reliable data collection instrument (survey), which can be effectively utilised to extract the desired data. In addition, the factor analysis is often used to identify an efficient number of constructs that explains the variable, and therefore, remove redundant (highly correlated) constructs from the investigated variable. With any extraction method, two questions may arise to be answered; "How many components are needed to represent the variables?" and "What do these components represent?"

iii] *Reliability Analysis*:

After conducting the factor analysis, the reliability analysis is needed to investigate the suitability of measurement scales (factors) and the items (attributes) that compose the scales. The reliability analysis calculates some commonly used measures of the reliability scale and also provides information about the relationships between the

individual items on the scale. By using the reliability analysis, it can be determined the extent to which the items in the survey are related to each other, therefore, the items that cause a problem can be identified, which needs to be excluded from the scale. On another hand, applying 5-point scales enable to calculate the reliability indices using the internal consistency method, which measures the relations between different items (attributes) of the same scale (factor) to determine if these items belong to the same dimension (factor). The statistic used to measure these correlations is the Cronbach's Alpha Reliability Coefficient Index, which is used to present the internal consistency based on the average correlation. In this regard, the higher the index revealed, the stronger the relation between the constructs of the same factor.

iv] *Correlation Analysis*:

Correlation analysis is also required in this study to indicate the significant association between different attributes among the internal and external factors with the indicators of incubators' success in the UAE. As such, having 5-point scales measures, the Bivariate Correlations procedure will be adopted to compute Pearson's correlation coefficients with its significance levels. Pearson's correlation coefficient assumes that each pair of variables is bivariate normal. Correlations measure how variables are related to each other. Pearson's correlation coefficient is a measure of linear association, but if the relationship is not linear, it is not an appropriate statistic for measuring their association. The Bivariate Correlations procedure computes the pairwise associations for a set of variables and displays the results in a matrix. It is useful for determining the strength and direction of the association between the two scale variables.

v] *Multiple Regression Analysis*:

The multiple regression analyses will be used in this research to measure the effects of the internal and external factors as independent variables on the success of the incubators in the UAE as dependent variables. Therefore, by applying the multiple regression analyses, the results will enable to predict the contribution level of each internal and external factors on each incubations' success measures that have been defined in this study. The significant level (p) of the multiple regression model will be set at 0.05, which is commonly agreed on a level by the researchers. Also, many statistical packages use this level as a default choice.

Therefore, to investigate the possible relationships between the external and internal enabling factors (eight independent variables) and the success measures of the incubators (three dependent variables), two sets of regression models will be used. The first set includes four regression analyses using the four internal enabling factors as predicted variables with each success index at a time. The second set will follow the same by conducting four regression analysis using the four external enabling factors as predicted variables with each success index at a time. Thus, the multiple regression models will be presented in the following form:

Model 1: The regression model of the internal factors that contribute to the success indices**:**

$$\hat{\mathbf{Y}}_{\text{success index}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\mathbf{F}_1 + \boldsymbol{\beta}\mathbf{F}_2 + \boldsymbol{\beta}\mathbf{F}_3 + \boldsymbol{\beta}\mathbf{F}_4$$

where: **Y** = Perceived level of incubators' success indices in the UAE (Graduating entrepreneurs from the incubator index, creating start-up companies index, and sustaining incubated entrepreneurial businesses index), using each success index at a time.

F1. The availability level of infrastructure and the services in the incubator.

F2. The networking accessibility level of a business incubator.

F3. The qualification and experience of the management and the technical team at the incubator.

F4. The availability level of commercialisation conditions in the business incubator.

Model 2: The regression model of the external factors that contribute to the success indices:

$$\hat{Y}_{\text{success index}} = \alpha + \beta F_5 + \beta F_6 + \beta F_7 + \beta F_8$$

where: Y = Perceived level of incubators' success indices in the UAE (Graduating entrepreneurs from the incubator index, creating start-up companies index, and sustaining incubated entrepreneurial businesses index), using each success index at a time.

F5 = the governmental support level offered for the business incubators in the UAE.

F6 = the financial resources are available for the business incubators in the UAE.

F7 = the UAE market conditions regarding collaboration level with the business incubators.

F8 = the entrepreneurship culture in the UAE in terms of identifying novel ideas, risk-taking, experiment future opportunities, and willingness to be incubated.

4.7 Methodological Framework

Based on the adopted research methodology, a methodological framework is developed as summarised below in Figure 5. In the first stage, the research background is developed in terms of the need for business incubators in the UAE, the study problem, and why it is essential to address the success of business incubation and its

roles in the country. In the second stage, in order to achieve the first research objective, the comprehensive research literature is conducted to build a base for the study.

In the existing literature, lots of insights were gained that helped in two ways; i) Firstly, building a strong background about several aspects of business incubation as well as updated knowledge about the current incubators in the GCC region, and ii) Secondly, developing suggested success factors to build a conceptual framework for business incubations' success in the UAE.

The third stage of the study is divided into two parts to collect and analyse the data using qualitative (through interviews with 25 experts representing stakeholders of business incubators) and quantitative approach (through structured survey targeting management of incubators and incubated entrepreneurs). Finally, in the last stage, the study discusses the results using different approaches (thematic analysis for qualitative data and descriptive as well as inferential analysis for quantitative data) and propose recommendations based on the study findings.

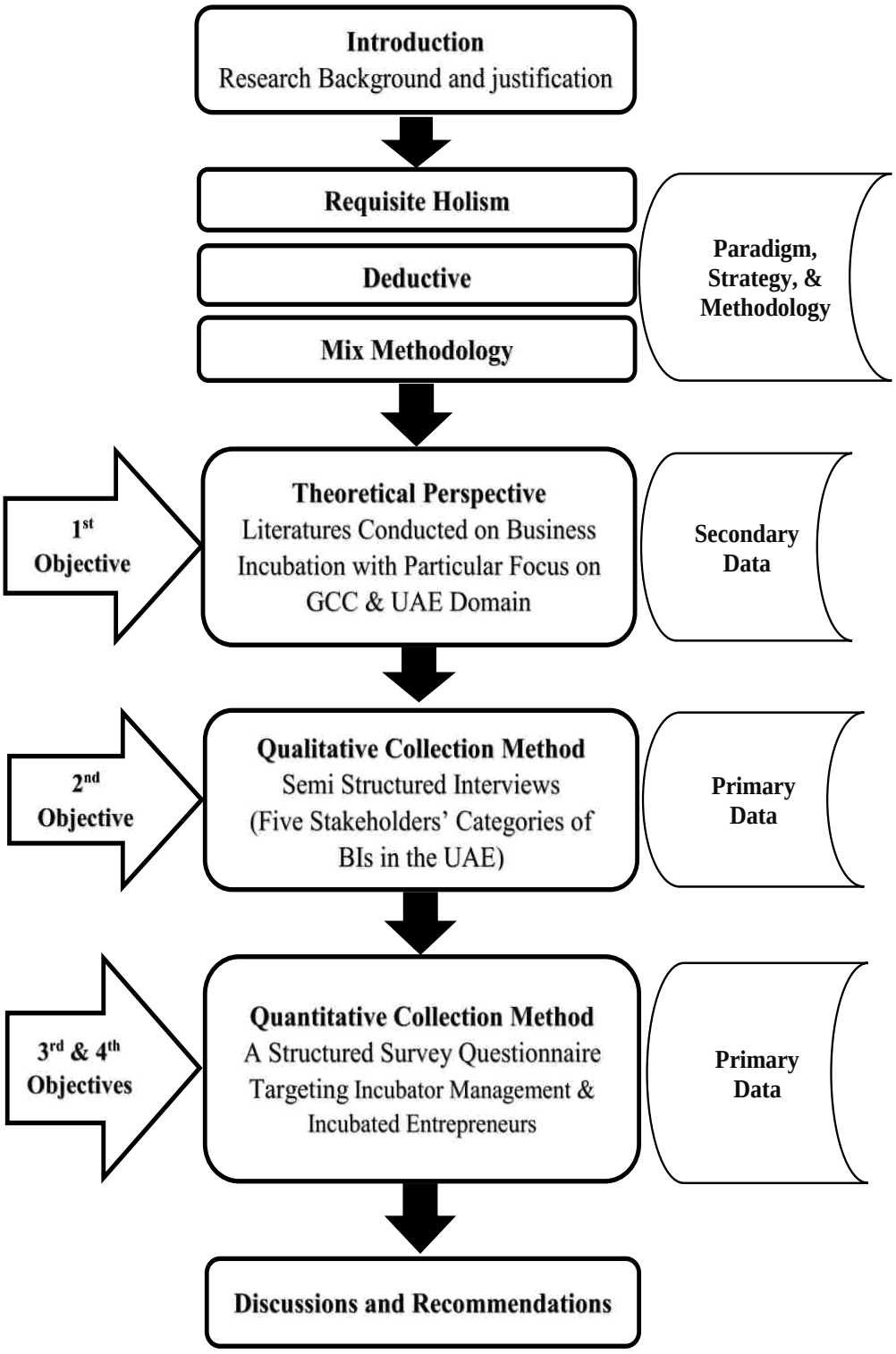

Figure 5: Methodological framework

4.8 Ethical Consideration

According to the Ethics Codes of the American Psychological Association's (APA), several ethical standards have to be fulfilled when developing research studies. For instance, when collecting data from the targeted group, individuals should be freely participating while having the rights to reject or withdraw from the study without any obligations. Also, researchers are requested to inform the participants about the objectives of the study, their nature of participation, and any expected consequences. Thus, it is necessary to develop unspecified questions, for which exposure of responses would not affect their reputation, while respecting their privacy as well as the confidentiality of their views (Smith, 2003).

In this study, a covering letter explaining the research objectives and its importance have been included in the adopted research methods (interview questions as well as survey questionnaires). Also, the covering letters have mentioned the expected time required to participate in the interview as well as in the survey questionnaire. Moreover, the covering letter has clearly stated that the responses would be treated confidentially and will be used for research analysis only. Finally, participants of interview sessions have taken their approval to record the interviews for the accuracy of collecting data. As a result, and based on the review of the research advisory panel, the research proposal and the research methods used has fulfilled the ethical requirements of Social Sciences Research Ethics Committee in the UAE University, and therefore, obtained their approval in writing before starting the data collecting exercise.

4.9 Conclusion

This Chapter described how the research would achieve the research objectives. As such, a research design has been developed to summarise a method of achieving each research objective. Due to the scarcity of literature conducted on business incubation within the UAE domain, this research followed a requisite holism research paradigm by considering some selected factors in the real world that may affect the success of business incubators as well as proposed specific roles that are expected from the business incubators in the UAE. Therefore, the researcher played the role of "expert" on behalf of study beneficiaries (for people), while investigating the research problem as an "outsider".

Due to the exploratory and descriptive nature of the research, the study also had to use a mixed methodology to collect and analyse the required data. Moreover, as this study follows a top-down approach, this research applied a deductive approach using mix methods to collect the required data. The proposed research methods consisted of interview technique, which will be applied to identify the factors affecting the success of business incubators and their expected roles, as well as survey questionnaire to describe specific facts and level of their importance related to those factors and roles of business incubators in the UAE.

As far as the method of analysis, the researchers used thematic analysis approach for analysing qualitative data, while descriptive, reliability, factor, correlations, and regression analysis approach were used for analysing the quantitative data. Finally, the research followed ethical standards set by the UAE University to avoid any anticipated risk of jeopardising the ethical considerations.

Chapter 5: Data Collection and Analysis

5.1 Introduction

Collecting and analysing data is the implementation part of the research methodologies. According to Seaman (1995), data collection exercise defines the outcomes of the research study through analysis and discussion. In the data collection phase, several instruments can be used by the researcher such as questionnaires and interviews to collect the desired data. In this study, the researcher is considered as an "informed outsider" that wishes to access the business incubation's experience of respondents in order to collect and analyse the related data.

The collection of required data for this study is based on the research boundaries as suggested by Miles and Huberman (1984) to consider the following dimensions:

i] *The setting*: where is the place of the research? Within the UAE domain.

ii] *The actors*: who will be the respondents? Stakeholders of the business incubation in the UAE (management of incubators, incubated entrepreneurs, mentors, investors, and government-related entities).

iii] *The occasion*: what the respondents will be asked? The perception of success, the success factors, and the roles of incubators in the UAE.

iv] *The process*: what is the nature of the event? The relationship of:

- Independent factors affecting the success of business incubation,
- Roles of business incubation in the UAE domain.

As discussed in Chapter-3, this research proposed a conceptual framework for business incubation in the UAE. The framework consists of two relationships; the first relationship addresses the factors (independent variables) that may influence

incubation's success (dependent variable) in the UAE. In the second relationship, the study investigates the expected outcomes of business incubation (independent variable) by examining its roles (dependent variables) at the *macro* level and *micro* level within UAE domain. Although there are many external and internal factors are associated with the success of incubators, it is expected that some specific factors are critical for the success of incubators within the UAE domain, which was not researched. Similarly, the current roles of successful incubators in the UAE have not been investigated, particularly in six dimensions, which was discussed in chapter three.

Based on the proposed study design, this Chapter is divided into two parts; these are: i) data collection and ii) data analysis. Each stage of data collection and analysis was elaborated according to the proposed research design. In the data collection part, primary data were collected to identify the potential success factors, as well as the roles of incubators through semi-structured interviews. Following that, another phase of collecting primary data was conducted in order to describe the success factors of incubation as well as the roles that are expected from incubators in the UAE through a survey questionnaire. In the second part of this Chapter, the approach to data analysis for each type of data (primary data) are discussed, followed by analysing the primary data the collected from both interviews, as well as questionnaire survey. Each set of data employed an appropriate analytics tool.

5.2 Collecting Data for Second Research Objective

5.2.1 Approaching Targeted Respondents

The interviews targeted experienced individuals within the five categories of business incubation's stakeholders whether they are directly working with or affected by

business incubation in the UAE. Due to professional experience and the networking of the researcher in the field of business incubation within the UAE, this research followed non-probability purposive sampling for nominating the interviewees and within the selection criteria adopted in this study. As a result, the initial search method for targeted interviewees was developed from existed incubators mainly that are government owned (e.g., Sharjah Entrepreneurship Centre) or the university-based ones (e.g., the incubator in the UAE Science Park at UAE University).

Following that, an extensive search conducted at websites of active incubators in the UAE as well as their social media accounts to collect the nominated names within the five targeted categories. Furthermore, the two interviewees at the pilot interviews stage supported this study by recommending more potential experts that meet the selection criteria as well as approaching them for an introduction. Thus, based on the selection criteria as well as professional relationships and networking exercise among the stakeholders of incubators, an initial list of thirty names have been developed.

Regarding approaching the nominated interviewees, emails were sent to them explaining the nature of the investigated research, the research objectives, interview protocol (including the confidentiality of their names and their feedback), and their preferred time for conducting the interview. All correspondences were sent by the researcher and followed by calling their respective assistants to maximise the response rate. The emails were sent approximately one week before the time of conducting the interviews; this aided to facilitate arranging the interview schedules as per the data collection plan. As a result, after continuous follow-ups and networking exercise, twenty-five interviews were successfully managed to be interviewed for this study, which was categorised into five groups, as shown in Table 17.

Table 17: Confirmed interviewees and their category

#	Stakeholder Category	No. of Interviewees
1	Government Supporter	5
2	Start-up Investor	5
3	Incubator Management	5
4	Mentor at Incubator	5
5	Incubated Entrepreneur	5
Total		**25**

Receiving confirmations from all five categories in a short period were quite a challenge; particularly from the investors' side, which deals with business incubators on an ad-hoc basis. This is due to being busy with lots of pre-planned activities and commitments inside the UAE and within the GCC region. As a result, conducting twenty-five interviews took some time to get all confirmations from the five categories.

5.2.2 Conducting Interviews

The interview method aims to address the second research objective by exploring three issues from the targeted respondents; their perception of business incubation's success, key factors affecting the success of incubators, and the roles of business incubators in the UAE. As such, a face-to-face interview was conducted with 25 professionals that have sufficient experience dealing with business incubators in order to directly capture their feedback. The interview duration ranged from 25 to 35 minutes. The researcher printed the interview questions and used them for reference without following the exact sequence of the questions. All interviews started with a brief background of the study as well as its importance for the government and the business incubators themselves in the UAE. Also, the interviewees have been informed that their names would not be declared. The questions were open-ended in order to keep the discussion

going particularly at the critical questions related to success factors or the roles of business incubators. In this regard, the interviewees were not interrupted while answering the questions and discussing the reasons for the existence of those factors or the impacts occurred out of business incubators in the country.

Thus, it is expected that the interview participants will produce some useful insights. Also, it is anticipated that the sponsors of incubators in the country are interested to know the factors affecting the performance of incubators based on experts' views. On another hand, due to investment allocated by the respective government entities, the federal and local governments in the country would be interested to understand the actual roles of those incubators about supporting country's national strategies as well as developing entrepreneurship practices.

5.3 Collecting Data for Third and Fourth Research Objectives

5.3.1 Sampling and Sample Size

This study targeted two categories of respondents for collecting primary data through a questionnaire. Respondents were either from incubator management or entrepreneurs that are incubated. In this regard, it is worth mentioning that in parallel to the launching of innovation strategies at federal and local levels in the UAE, different types of incubators have been established in the country for different reasons. However, scholars and industry related professionals have not researched those new cases except the study of Byat and Sultan (2014).

Nevertheless, based on secondary data sources from government documents and official websites, 14 incubators have been identified in the UAE. However, after approaching those incubators, the list reduced to 11 incubators only. The reason is that

some incubators were closed, while others shifted their activities to become co-working spaces. Thus, as shown in Table-18, the list of active business incubators in the UAE has been considered as the total population of the study. Table-18 shows that the eleven business incubators are categorised based on ownership and distributed into six public incubators, three private incubators, and two university-based incubators. A brief description of each business incubator is presented in the Appendix (VI).

However, determining the sample size of the study is a critical procedure during the primary data collection exercise. Thus, given the small number of total population (the number of individuals in the management of eleven business incubators) and the assumption of low response rate, the study will target all the individuals of management at the eleven business incubators for collecting primary data in order to maximise the number of responses.

Table 18: Active Business Incubators in the UAE

#	Business Incubator
1	UAEU Science and Innovation Park (SIP)– UAE University
2	StartAD, NYU Abu Dhabi
3	RAK Incubator & Accelerator
4	The Cribb
5	Krypto Labs
6	In5
7	Hamdan Innovation Incubator (HI2)
8	INTELAK Incubator
9	Dubai Technology & Entrepreneurship Centre (Dtec)
10	Khalifa Innovation Centre (KIC)
11	Sharjah Entrepreneurship Centre (Sheraa)

Consequently, the study approached the incubation directors, project managers, programmes the managers, and programme supervisors. In this regard, Verma (2005) indicated the importance of the feedback from the incubator seniors, as their day-to-day management builds valuable insights, which would make them in position to provide valuable information about the enabling factors that directly affect their incubators' performance. Thus, assuming that every eleven incubators have six full-time employees, this study will seek to collect at least 30 responses in total (6 employees * 11 incubators = 66) with a response rate not less than 30% from total population.

The second category of respondents included entrepreneurs who were either founders or partners of start-ups and already have been incubated or recently graduated from those eleven business incubators in the UAE. This category of the sample was critical for achieving the third and fourth research objectives as they have experienced the incubation life cycle, and therefore, built valuable perceptions about factors and conditions that affected their business performance while they have been incubated. However, it is known that the sample size may affect the reliability and validity of the research. Therefore, the targeted samples of incubated entrepreneurs need to be representing the total population in order to generalise the findings.

In this regard, Kamdar (2012) studied the role of business incubators in promoting entrepreneurship in India. The researcher built his sampling model by targeting five incubated entrepreneurs per incubator. However, due to a big difference in population between the UAE and India, this study followed, in principle, the same approach of Indian study but targeted all active incubated entrepreneurs from those eleven business incubators, as well as entrepreneurs and start-ups that recently graduated. This is

mainly to increase the response rate in order to be able to generalise the findings. Thus, assuming that each eleven incubators have incubated ten entrepreneurial ventures or start-ups, and assuming that each start-up has a team of two, this study will seek to collect at least 50 responses in total (10 start-ups * 2 entrepreneurs * 11 incubators = 220) with a response rate not less than 20% from total population.

Thus, having the feedback from both categories (management of incubator and incubated entrepreneurs), the collected data will help in identifying the necessary factors for sustaining the existed business incubators as well as for the successful establishment of future business incubators in different fields in the UAE. In more specific, the primary data is useful in four aspects:

i] For endorsement purpose by comparing the feedback of questionnaire results with secondary data collected from business incubation studies in the GCC.

ii] For validation purpose by comparing the feedback of two categories of respondents with primary data collected from five categories of respondents through interview results, concerning the eight proposed factors that affect the success of business incubators and their roles in the UAE.

iii] For confirming the proposed conceptual framework of business incubation in the UAE or modify it based on the feedback of relevant respondents

iv] For assessing the level of alignment of responses between the two categories, in which it further validates the conceptual framework of business incubation in the UAE.

5.3.2 Approaching Targeted Respondents

The ultimate source for approaching the two categories of the respondents (management of incubators and the entrepreneurs) were from the eleven incubators

that are currently operating in the UAE. Thus, in order to collect the primary data accurately. So, specific steps were followed:

i] Initial communication developed with the eleven incubators about the research intention and the expected outcomes and benefits.

ii] A set of meeting schedule has been arranged in advance with the management of each business incubator.

iii] Meetings and discussions have been conducted with each incubator on the method of approaching the targeted respondents for both categories.

iv] The approach of collecting data and follow-ups with each category of respondents have been organised.

Concerning the first category of respondents, and due to the limited number of total population (management staff of eleven business incubators in the UAE), a face-to-face approach was adopted in order to maximise the response rate from incubation management. The professional relationship of the researcher with most of the business incubators has helped for increasing the response rate. Also, a focal point person was assigned at each incubator to distribute and collect the hard and soft copies of the survey. Furthermore, an online survey using google forms was circulated among targeted employees by email. The online survey was a convenient approach because the respondents were able to fill the survey through their smart mobile devices.

The online survey also had an advantage of making sure that all questions are answered appropriately. However, the collection exercise took two months. This is due to several site visits and follow-ups with all eleven incubators, which were located in different cities in the UAE. As a result, assuming that every eleven incubators have recruited six employees (6 employees * 11 incubators = 66), the study managed to collect 33

responses in total with a response rate of 50 % from the total population, which was within the anticipated response rate.

In the case of the second category of the respondents, approaching the incubated entrepreneurs was even harder due to the difficulty of meeting them at different incubators and the lack of incentive to participate in this study. Therefore, the researcher approached the management of each incubator and asked them for their support in circulating the survey among their incubated entrepreneurs. Also, hard copies of the survey were distributed by the focal point person at each incubator. Weekly follow-up calls and emails were conducted to maximise the response rate. After two months of efforts, the responses did not exceed than 30 participants. To overcome the low response rate from the incubated entrepreneurs, an online version of the survey was developed to reach the targeted respondents directly".

Moreover, the researcher noticed that the majority of entrepreneurs' community have social media accounts, particularly on Twitter and LinkedIn. Thus, the researcher went into social media accounts of the eleven business incubators (their Twitter and LinkedIn accounts) and started to extract the account addresses of their incubated entrepreneurs. A substantial number of accounts was collected and started to approach them directly through the social media account of the researcher. Brief information about the study with the online link of the survey was included in the message. The response of the incubated entrepreneurs took approximately three months and a half. As a result, assuming that each eleven incubators were incubating ten entrepreneurial start-ups at different stages of incubation cycle, and each start-up may consist of two founding entrepreneurs, (ten start-ups * 2 entrepreneurs * 11 incubators = 220), the

study managed to collect 52 responses in total with approximate response rate of 23% from total population, which can be considered a minimum acceptance rate.

However, all the data collected from the two categories of respondents will be kept for some time after completing this study. This is to address any future requirements for validity checks that might be needed. In the same time, the researcher assured for all participants that all data collected will be treated in a highly confidential manner.

5.4 Data Analysis

This study mainly investigates the factors affecting the success of business incubators as well as examines its roles in the UAE. Thus, in order to achieve the research objectives, this study collected secondary and primary data using different research methods. In the literature review and business incubation framework chapters, the secondary data were analysed in order to support the outcomes of primary data. In the following sections, the primary data will be analysed using the appropriate method for each category of data collected in order to present the results with interpretations accurately.

5.4.1 Data Analysis for the Second Research Objective

In this study, the second research objective is explicitly concerned with exploring the critical factors in which incubators are expected to be successful, in addition to identifying their roles at macro and micro in the UAE domain. Therefore, semi-structured interviews have been conducted with the twenty-five subject experts drawn from five categories of business incubation's stakeholders. All interview sessions were taped, after that saved on the computer; later, transcribed the collected data into a word document. The data were refined into a new document by distributing the collected

answers based on the questions to extract the key themes and their associated details during the data analysis. The recorded files will be retained for any references or explanations that might be needed in the future.

The experts discussed several factors that influence business incubations' success. Also, the experts identified the current benefits and roles of incubators in the UAE at a country perspective as well as an individual level. Those captured qualitative data are presented in different tables to break down the findings, which will be discussed in the following sections.

5.4.1.1 The Key Measure of Business Incubation's Success

Concerning measuring the business incubations' success, the 25 interviewed experts in the five categories of business incubations' stakeholders suggested some measures that could be considered. Appendix VII shows all measures suggested by the twenty-five experts. Looking into the overall suggestions based on the categories of incubators' stakeholders as presented in Appendix VII, the responses of interviewees could be divided into two groups; these were:

i] input-driven measures coming more from government representatives, such as the number of ideas generated, number of incubated entrepreneurs, and the number of IPs registered, and

ii] the rest of categories (e.g., investors, mentors, incubated entrepreneurs, and management of incubators) considered more of output driven measures such as some start-ups created, sustained in the market, and revenue generated.

Nevertheless, a substantial number of interviewees from different categories focused on the ultimate goal to establish successful start-ups that progressed after the stage of

minimum viable products that could make multiple records of sales and is managed to sustain their businesses after the incubation phase. This indicates that the incubation cycle was useful for incubated entrepreneurs and the support and services offered for them was beneficial to progress their businesses at different stages of incubation. Finally, some exceptional measures were suggested by specific interviewees that serve strategic objectives such as the ability of start-ups to create jobs in order to support the government, their contribution to GDP in order to support the local economy, or ideas generated from R&D in order to generate revenues for the universities.

To further analyse the success measures suggested by the interviewed experts in business incubation, the proposed measures were grouped based on their relevance to each other. As a result, Table 19 is developed, which revealed the most common measures agreed by the interviewed experts in five categories of business incubation.

Table 19: Measures of incubators for five categories of incubations' stakeholders

Assessing Incubators' Success in the UAE based on the 25 experts' views?	**No. of Views**	**Percentage**
Number of start-ups created	12	48%
Number start-ups sustained in the market	11	44%
Number of jobs created	8	32%
Number of graduates of entrepreneurs	7	28%
Number of revenues entrepreneurs are making	7	28%
Number/amount of funds raised	6	24%
Number of incubated entrepreneurs	6	24%
Number of intakes into the incubators	4	16%
Number of IP creation/registered	3	12%

The result showed that the 48% of interviewees have agreed on the number of start-ups created as one of the most critical measures to assess the success of an incubator in the UAE, followed by the number of start-ups that are sustained in the Market (44%) beyond the support of an incubator. As far as the least success measure determined the interviewed experts, the result showed that only 12% of interviewees have suggested that incubators need to be measured based on the number of IPs created or registered.

5.4.1.2 Perception of Business Incubation's Success

Respondents from the five categories of business incubations' stakeholders have shown a wide range of criteria concerning the perception of incubators' success in the UAE (see Appendix VII). As shown in Table 20, for incubators to succeed in the UAE, the interviewed experts rated the ability of incubators to graduate entrepreneurs with sustainable businesses in the open market as the highest criteria of success. Also, a considerable number of interviewees believed that business incubators are successful when they can produce start-ups that can sustain in the external market.

Table 20: Experts' perceptions of five business incubations success in the UAE

Perception of Incubators' Success by 25 Experts Represent to Five Categories of Incubation' Stakeholders in the UAE	No. of Views	Percentage
Sustaining Incubated Entrepreneurs in the Market	13	52%
Creating start-up companies	9	36%
Graduating entrepreneurs	7	28%

These two success criteria indicate that the stakeholders of business incubators in the UAE are keen to increase the number of SMEs in the market by producing value-added services. Moreover, the analysis of feedbacks received from interviewees in

government was revealed that their perception of success is more input oriented such as providing conducive environment, value-added services, and conduct networking activities, while interviewees from investors at incubators and the management of incubators categories are more concerned with tangible output in the form of increasing sustainable start-ups in the market, which reflects their objectives of sourcing investment opportunities for investors or incubators themselves.

5.4.1.3 The Critical Success Factors for Business Incubators in the UAE

The researcher conducted a series of interviews with 25 experts representing five categories of business incubations' stakeholders have provided a wide range of success factors that may affect the performance of incubators. Those enabling factors are either under the control of business incubators such as the networking capability, as well as factors that are beyond the capacity of business incubators such as having conducive policies that regulate the business incubators and its activities. Appendix VIII presents all critical success factors that suggested by the 25 experts and divided based on the category of incubations' stakeholders.

However, in order to better organise the collected data and conduct a content analysis, the factors were categorised into either internal or external. Also, those suggested factors were distributed into eight factors based on the proposed conceptual framework of incubations' Success in the UAE. As a result, Table 21 and Table 22 are summarising the distribution of internal and external success factors as defined by the twenty-five experts for the five categories of incubations' stakeholders in the UAE, as well as the number of experts' views about each enabling factor and sub enabling factor.

Table 21: Incubators' internal success factors of five business incubations in the UAE

Internal Success Factors	Sub-Success Factors	No. of Views	Total No. of Views	Rank
Infrastructure	Facilities & admin services	11	13	4
	Entry and exit criteria	2		
	Tenants' contract	-		
	Progress criteria	-		
Networking	Information sources	7	32	1
	Expertise	4		
	Fund sources	13		
	Targeted customers	8		
Human Resources	Management Qualification	4	21	3
	Technical Qualification	4		
	Management Experience	5		
	Technical Experience	8		
Commercialisation Condition	Generating/assessing ideas	11	30	2
	Testing concepts and assessing its feasibility	9		
	Supporting IP protection	4		
	Supporting start-up creation	6		

The initial analysis of Table 21 shows that all internal factors were considered by the twenty-five interviewees except the factor of "having clients' contract" and "having progress criteria". Also, some of other sub-factors were received minimal attention by interviewees such as entry and exit criteria factor. Moreover, when analysing the overall ranking of internal enabling factors, the results showed that networking accessibility and commercialisation condition were considered the highest internal factors that might influence the potential success of incubation in the UAE, comparing to infrastructure factor, which is considered the lowest among the four internal factors. Finally, the fund sources under the networking factor, which reflects the accessibility

level of incubators to different fund sources in the UAE, had the highest concerns by the twenty-five experts that were interviewed.

When analysing the proposed success factors from the five categories of interviewees as summarised in Appendix VIII, it was noticed that respondents from the government, mentors, and investors representatives suggested both internal and external factors equally. As far as interviewees from incubation management and incubated entrepreneurs, their focus was more to external success factors that affect either their operation (for incubation management) or their business progress (for incubated entrepreneurs). However, when counting the highest number of factors suggested by the five categories of interviewees, it was noticed that the management of incubators and the incubated entrepreneurs recorded 42 factors in total, which is logic as they witnessed and experienced actual situations that enable them to capture those factors. On the other hand, the overall analysis showed that 106 factors were external comparing to 95 internal factors from all categories of interviewees. This finding indicates that the challenges of operating business incubators in the UAE are more related to the external environment.

On the other hand, when the external factors were analysed based on the views of twenty-five interviewees, the result showed that all external factors were considered**.** The stakeholders of business incubators participated in the interviews believed that the financial resources factor was viewed as the highest external factor for incubators to succeed. This result aligned with the high number of views concerning the accessibility to funding sources by the incubators in the UAE at internal factors category. As far as the highest concerns by the interviewees among the external factors, the result showed that policies under the government support factor, which govern the incubation

business in the UAE, had the highest concerns by the twenty-five experts. Table 22 shows the results of the incubators' external success factors defined by twenty-five experts representing five categories of incubations' stakeholders in the UAE.

Table 22: Incubators' external success factors of five business incubations in the UAE

External Success Factors	Sub Success Factors	No. of Views	Total No. of Views	Rank
Government Support	Policies	17	40	2
	Incentives	12		
	IP services	1		
	Access to funds	10		
Financial Resources	Government funds	9	45	1
	Private sector funds	8		
	Venture Capital funds	12		
	Banks loans	8		
	R&D funds at universities	8		
Market Condition	Governments' collaboration	7	32	3
	Universities' collaboration	12		
	Industries' collaboration	9		
	Customers' collaboration	4		
Entrepreneurship Culture	Novelty of ideas	2	18	4
	Risk-taking	9		
	Identifying opportunities	2		
	Willingness to be incubated	5		

5.4.1.4 Business Incubation Roles at Macro Level and Micro Level

The interviewees from all the categories of business incubations' stakeholders had high expectations from current business incubators in the UAE. Their feedback showed a variety of expected roles that need to be realised. The summary of feedback revealed by interviewed experts from all five categories is presented in Appendix (IX). The feedback of interviewees concerning the roles of business incubation was further

analysed to reveal the most common benefit expected from business incubators in the UAE. All experts interviewed from different business incubations' stakeholders in the UAE believed that business incubation model might bring great benefits at the macro level for the country as well as at micro level for entrepreneurship themselves. The result showed that nurturing entrepreneurs had the highest views among interviewed experts, while the remaining roles expected from business incubators were also highly considered by the interviewees of the study. Table 23 shows the results of the incubators' roles defined by twenty-five experts representing five categories of incubations' stakeholders in the UAE.

Table 23: Incubators' roles of five business incubations in the UAE

Role Category	Business Incubations Roles Defined by 25 Experts	No. of Views	Percentage
Macro Level	Developing entrepreneurship culture	10	40%
	Contributing to the local economy	12	48%
	Supporting national innovation strategy	10	40%
Micro Level	Nurturing entrepreneurs	15	60%
	Creating jobs	13	52%
	Commercialize new products/services	10	40%

When the feedback of interviewees was analysed based on the category of respondents (stakeholders of business incubation in the UAE), the analysis showed that interviewees from government stakeholders think that business incubation may become an effective enabler for diversifying the local economy, supporting the transition to knowledge-based economy through innovative products and services, and therefore support the national innovation strategies. As far as interviewees with investment background are concerned, they perceive business incubation as an economic tool for contributing to the GDP through value-added jobs and start-ups entering the market.

Also, investor related interviewees think that business incubation plays the role of catalyst for improving the entrepreneurship community in the country. With regards to the interviews participants from incubation management and mentors' categories, the two groups believed that business incubation might support the local economy, feed the market with more value-added SMEs that solve actual problems, and more importantly, develop the entrepreneurship ecosystem through improving the policies related to entrepreneurship and start-ups in the country.

Concerning the roles of incubators at the micro level for entrepreneurs, it was noticed that majority of interviewees from all business incubations' stakeholders' categories have agreed on the role of nurturing entrepreneurs and the opportunity of developing their skills and experience once they go through the incubation cycle. Also, government participants in the interviews believed that business incubation might benefit individual entrepreneurs in pursuing entrepreneurship as a career by creating their jobs after trying this experience under various incubation environments.

Moreover, interviewees coming from an investment background believed that business incubation might help entrepreneurs in establishing successful start-ups due to their experience gained at the incubator, while interviewees from the management of incubators indicated that incubation would be a good platform for entrepreneurs to depend on themselves and make revenues out of their entrepreneurial ventures. Finally, incubated entrepreneurs and their mentors participated in the interview panel perceive business incubation as an excellent opportunity for gaining useful knowledge and be exposed to life experiences that will mature their business ideas and create their start-ups to sell innovative products and services.

5.4.2 Data Analysis for Third and Fourth Research Objectives

The third and fourth research objectives seek to describe four external factors (government support, financial support, market conditions, and entrepreneurship culture) and four internal factors (infrastructure, networking, human resources, and commercialisation condition) that are expected to influence on the success of business incubators in the UAE. Within each internal and external factor, a set of sub related factors have been identified and investigated. In this regard, Verma (2005) conducted a survey on managers of incubators in Canada to assess their views on the factors affecting the success of business incubators.

In the MENA region, Alsheikh (2009) used a survey method on incubated entrepreneurs at the Jeddah Business Incubator to evaluate the electiveness of the incubator from several aspects such as services offered and policies. Elmansori (2014) also conducted a questionnaire focusing on business incubators in Jordan and UAE as a comparative study. The researcher wanted to analyse the views of incubator managers in several aspects such as their services, performance, and their outcomes.

Thus, following the approach of the mentioned above studies, besides relying on the outcomes of theoretical studies and the results generated from twenty-five interviewed experts (stakeholders of incubators in the UAE), this study conducted a survey targeting the management of all active incubators, along with their incubated entrepreneurs to describe the effect of suggested influencing factors as well as examining the outcomes of incubators that may have an impact at macro and micro levels. The primary data which were collected from the two different groups will be through two separate survey questionnaires.

5.4.2.1 Results of Demographics of Business Incubation in the UAE

i] *Overview of Business Incubators in the UAE*:

Business incubation concept is considered a relatively new initiative in the UAE. Although the first incubator was established in 2002 by H.H. Sheikh Mohamed Bin Rashid Establishment for SME Development, it was more of a co-working space that gathered entrepreneurs under one physical space with some administrative services. Thus, after the global trend of accepting business incubators that provide common services, the UAE started to witness establishing different types of business incubators.

In this regard, the results of the survey showed that since 2012, different types of business incubators had been launched particularly in 2015 and 2016. Those incubators have been established as initiatives in response to the launch of National Innovation Strategy by the UAE Government in November 2014, which positioned business incubators as one of the enablers for realising innovation practices in the country. Table 24 illustrates the establishment of years of business incubators in the UAE, their types, and their location.

Table 24: Overview Business Incubators existed in the UAE

#	Business Incubator	Est. Year	Type	Location
1	UAEU Incubator - UAE University	2016	University-Owned	Al Ain
2	StartAD, NYU Abu Dhabi	2016	University-Owned	Abu Dhabi
3	RAK Incubator & Accelerator	2017	Public-Private Partnership	Ras Al-Khaimah
4	The CRIBB	2013	Private	Dubai

Table 24: Overview Business Incubators existed in the UAE (Continued)

#	Business Incubator	Est. Year	Type	Location
5	Krypto Labs	2016	Private	Abu Dhabi
6	In5	2016	Government	Dubai
7	Hamdan Innovation Incubator (HI2)	2015	Government	Dubai
8	INTELAK Incubator	2016	Public-Private Partnership)	Dubai
9	Dubai Technology & Entrepreneurship Centre (DTEC)	2012	Government	Dubai
10	Khalifa Innovation Centre (KIC)	2015	Public-Private Partnership	Abu Dhabi
11	Sharjah Entrepreneurship Centre (SHERAA)	2016	Government	Sharjah

Tables 24 indicated that the majority of incubators are government owned. However, some of the incubators were established a partnership between several government entities such as Khalifa Innovation Centre (a joint venture between Mubadala, Khalifa Fund, Tawazun, Khalifa University, and Ṣāndooq Al Wātān). Also, in terms of location of incubators, it was noticed that almost 50% of incubators are based on Dubai, which reflects the initiatives taken by Government-related entities to make Dubai a hub for entrepreneurs in the MENA region. Furthermore, it is worth mentioning that the location of the incubators has been carefully selected that are crowded by targeted and potential clients and supported by transportation services.

ii] *The Industry Sectors That Business Incubators Are Supporting in the UAE*:

In 2014, the UAE Federal Government announced its National Innovation Strategy which aims to promote innovation in seven economic sectors (see the summary of National Innovation Strategy in Appendix X). In the following year, the National

Science, Technology, and Innovation policy have been announced focusing on 24 areas (see the summary of National Science, Technology, and Innovation policy in Appendix XI), which represents a mix of opportunities and challenges faced by the country. Also, entrepreneurship-oriented incubators have been considered as enablers of the Strategy. Thus, it is critical to investigate whether the current business incubators are representing those focused areas within the targeted sectors.

As such, Table 25 shows that technology sector was dominant in terms of the targeted sector by the existed incubators in the UAE based the views of management of incubators (81.3%) and incubated entrepreneurs (63.5%). The second highest industry that was targeted by the incubators was the transportation sector, which represented 59.4% of the views of incubators' management and 30.8% from the views of incubated entrepreneurs. In general, based on the feedback of the two categories of respondents, the results showed that the seven targeted sectors by the government had been considered by the current incubators in the UAE.

Table 25: Results of the Industry Sectors that are served by Incubators in the UAE

			Incubated entrepreneurs		
Industry sectors do business incubator support	**N**	**Count**	**N**	**Count**	**%**
1. Renewable Energy	33	17	52	16	30.8%
2. Transportation	33	19	52	16	30.8%
3. Technology	33	26	52	33	63.5%
4. Education	33	14	52	22	42.3%
5. Health	33	16	52	22	42.3%
6. Water	33	11	52	13	25.0%
7. Others, listed as below					
1. Space		9		8	15.4%
2. Test		2		0	0.0%
3. Design		3		0	0.0%

Table 25: Results of the Industry Sectors that are served by Incubators in the UAE (Continued)

	Business incubators			Incubated entrepreneurs	
Industry sectors do business incubator support	**N**	**Count**	**Per cent**	**N**	**Count**	**%**
4. Media		2	6.3%		0	0.0%
5. Travel & tourism		3	9.4%		0	0.0%
6. FinTech		3	9.4%		0	0.0%
7. Hardware		3	9.4%		0	0.0%
8. Trade		1	3.1%		0	0.0%
9. Logistics		2	6.3%		0	0.0%
10. Consultancy		1	3.1%		0	0.0%
11. R&D		0	0.0%		1	1.9%
12. Advertising		0	0.0%		1	1.9%
13. Events Organizing		0	0.0%		1	1.9%
14. Beauty		0	0.0%		4	7.7%
15. Entertainment		0	0.0%		2	3.8%
16. E-commerce		0	0.0%		1	1.9%

iii] *Type of Services Provided by the Business Incubators*:

It is generally known that different types of business incubators are providing a variety of facilities management services that is required by the community of entrepreneurs; therefore, promoting the utilisation of those value-added services. When the feedback of the two respondents was analysed, it was noticed that both categories highly agreed on the availability of some common services, such as developing business plans, providing physical space with administrations services, providing different types of training, conduct networking events, and support in creating start-ups as shown in Table 26.

Table 26: Results of the Services Provided by the Incubators in the UAE

Type of services provided by the business incubator	Business incubators			Incubated entrepreneurs		
	N	Count	Per cent	N	Count	Per cent
1. Assess entrepreneurial ideas, develop business plans, and support feasibility studies.	33	30	93.8%	52	41	78.8%
2. Provide different size of workstations with shared administrative services.	33	24	75.0%	52	33	63.5%
3. Provide shared services (legal, marketing, HR, accounting, financial, IT).	33	25	78.1%	52	22	42.3%
4. Provide mentoring and different types of training (technical, soft skills).	33	30	93.8%	52	36	69.2%
5. Organize networking events.	33	29	90.6%	52	31	59.6%
6. Support start-up creations and licensing.	33	24	75.0%	52	32	61.5%
7. Others, please specify	33	**6**	**18.0%**	52	**4**	**7.6%**
Business development & fundraising		1	3.0%		0	0.0%
Fund		2	6.0%		2	3.8%
Investment		2	6.0%		0	0.0%
IP registration, maker space		1	3.0%		0	0.0%
Crowdsourcing		0	0.0%		1	1.9%
Help with connections		0	0.0%		1	1.9%

However, both categories of respondents (particularly by incubated entrepreneurs) have shown high concerns in providing some other main services such as sourcing fund, IP registration support, and help in connecting to potential clients.

iv] *Overview of Business Incubators' Performance in the UAE*:

Creating start-ups and graduating from the incubator are considered some of the key indicators for incubators' success (Moreira & Carvalho, 2012; Lish, 2012). Table 27 shows management's feedback in incubators' performance in graduating

entrepreneurs from the incubator and supporting them in creating their start-ups. The number of graduates and start-ups created looked good in general compared to the overall years of establishing and operating incubators in the UAE. The results showed that (66.7%) of respondents (management of incubators) indicated for creating more than 15 start-ups through their incubators. Also, (57.6%) of respondents claimed for graduating more than 15 entrepreneurs from their incubators.

Table 27: Results of the business incubators' performance in the UAE

No. of created business incubators of start-ups	**Count**	**Per cent**
None	2	6.1%
1 – 5 start-ups	5	15.2%
6 – 10 entrepreneurs	2	6.1%
11 – 15 entrepreneurs	2	6.1%
More than 15 start-ups	22	66.7%
Total	**33**	**100.0%**
No. of entrepreneurs graduated from your incubator	**Count**	**Per cent**
None	4	12.1%
1 – 5 graduates	3	9.1%
6 – 10 graduates	5	15.2%
11 – 15 graduates	2	6.1%
More than 15 graduates	19	57.6%
Total	**33**	**100.0%**
Number of entrepreneurs is currently incubated	**Count**	**Per cent**
None	2	6.1%
1 – 5 entrepreneurs	1	3.0%
6 – 10 entrepreneurs	8	24.2%
11 – 15 entrepreneurs	3	9.1%
More than 15 entrepreneurs	19	57.6%
Total	**33**	**100.0%**
No. of entrepreneurs dropped out of the incubation process	**Count**	**Per cent**
None	6	18.2%
1 – 5 entrepreneurs	16	48.5%
6 – 10 entrepreneurs	3	9.1%
11 – 15 entrepreneurs	6	18.2%
More than 15 entrepreneurs	2	6.1%
Total	**33**	**100.0%**

When checking if the entrepreneurs frequently occupied the incubators, also based on the feedback of management of the incubators, the results showed that (57.6%) of respondents indicated that more than fifteen entrepreneurs are currently incubated, which reflects the good image of the incubators in general and shows that those incubators can add value to entrepreneurs'' requirements.

Finally, when checking how many entrepreneurs have left the incubation, (48.5%) of respondents indicated that a range of one to five entrepreneurs have dropped from the incubation before finishing the incubation cycle, while only (6.1%) responded that more than fifteen entrepreneurs have dropped out from the incubation cycle. This indicates good selection criteria to join the incubator from one dimension and the quality of entrepreneurs themselves from another dimension.

v] *Overview of Incubated Entrepreneurs' Background*:

The study aimed to know who is targeted as tenant by the current incubators operating in the UAE. Alsheikh (2009) considered the quality of incubator clients as one of the main indicators for incubators' effectiveness. Thus, when analysing the type of clients that was considered by the incubators, and although community member's category was considered the highest preference (90.6%), it was noticed that there was no preference on specific type of clients as shown in Table 28.

Table 28: Results of the incubated clients' type

Type of Considered Clients	Count	%
Undergraduate students	23	71.9%
Graduate students	24	75.0%
Faculty members	21	65.6%
Community members	29	90.6%
Others, please specify	**5**	**15.0%**
Anyone in Tech, Media and Design.	1	3.0%
Entrepreneurs	1	3.0%
Entrepreneurs, freelancers, corporates	1	3.0%
Existing early stage & serial entrepreneurs	1	3.0%
Industry	1	3.0%

Table 29: Results of incubated entrepreneurs' sources

Source of Incubated entrepreneur:	Count	%
Undergraduate students	23	44.2%
Graduate students	8	15.4%
Faculty members	2	3.8%
Community member	9	17.3%
Other, as below:	**10**	**19.2%**
Company Owner	1	1.9%
Independent	1	1.9%
Independent individual	1	1.9%
Post graduated	1	1.9%
RA	1	1.9%
SME	1	1.9%
Start-up company	1	1.9%
Start-up founder	1	1.9%
Strategic partnership	1	1.9%

When checking who are the actual tenants of business incubators in the UAE, as shown in Table 29, it was found that the undergraduate students were representing the majority of incubated clients (44.2%), followed by different mature entrepreneurs' groups (19.2%). In addition, when enquiring about the age and gender of incubated entrepreneurs, and as shown in Table 30 and Table 31, the results revealed a wide range of age starting from 19 years old (which most likely are entrepreneurs in the second year of their undergraduate studies) until 54 years old (which most likely are mature entrepreneurs willing to dedicate themselves in an entrepreneurial venture). However, the result revealed that the ages of incubated entrepreneurs are more focused around 27 years old, which indicates gaining a few years of work experience after graduation from universities and before joining the incubator.

Table 30: Results of the incubated entrepreneurs' age

Incubated entrepreneur					
Age	**N**	**Min**	**Max**	**Mean**	**S. D**
Age	52	19	54	27.50	7.555

Table 31: Results of Incubated Entrepreneurs' Gender

Incubated entrepreneur		
Gender	**Count**	**Per cent**
Male	34	65.4%
Female	18	34.6%
Total	52	100.0%

Moreover, in terms of the gender of the incubated entrepreneurs, it was found that the males represent (65.4%) of incubators' clients across the incubators operating in the UAE, which indicates that female students or even females in the community, in general, were not interested in joining incubators as much as male entrepreneurs.

vi] *Overview of Incubated Entrepreneurs' Performance*:

Section Four in the descriptive statistical analysis highlighted the performance of the business incubators in the UAE. Similarly, this section observes entrepreneurs' performance in terms of entrepreneurs' ability to employ for the progress of their start-ups. Also, the duration of incubation by the entrepreneurs indicates their progress as well as the efficiency of their projects and supported by their work experience (Mubaraki & Busler 2014). Thus, based on the responses of incubated entrepreneurs as shown in Table 32, 48.1% of responded entrepreneurs indicated that they have not employed anyone to support their start-ups, while (25.0%) entrepreneurs indicated that they employed one to three employees, which could be in full or part-time basis.

Table 32: Results of incubated entrepreneurs' performance in the UAE

	Business incubator	
	Count	**Per cent**
Years of total work experience		
1 year	36	69.2%
2 years	6	11.5%
4 years	10	19.2%
How long you are based in the business incubator		
0 – 2 months	7	13.5%
3 – 6 months	11	21.2%
7 – 12 months	8	15.4%
More than 12 months	26	50.0%
Number of people have business been able to employ		
None	25	48.1%
1-3 employees	13	25.0%
4-7 employees	7	13.5%
More than 7 employees	7	13.5%

Another dimension of entrepreneurs' performance is the duration of their stay in the incubation, in this regard, 50.0% of the responded entrepreneurs stated that they stayed more than 12 months at the incubation, which indicates that they are taking their time for materializing their start-ups and exit policy of the incubation is supporting such a duration. This result is not surprising as the results of the work experience of the entrepreneurs showed that 69.2% of responded entrepreneurs had one year of experience, while those who had four years of experience were 19.2% of respondents.

5.4.2.2 Results of Factor Analysis

In order to conduct factor analysis, all the primary items (n=46) in the survey that represents the investigated factors were entered using the Extraction Method. The detailed results of the factor analysis are presented in Appendix XII. The detailed factor analysis results in Appendix XII showing that nine components are transforming the scales of the questionnaire. The correlation of the items on each component varied from negative correlation to positive ones, as well as from very low (0.000) to very high (up to +0.875). A cut score of (0.500) was set as a selection score of the items on its component. The results of the rotated components matrix revealed that eight components (factors) out of nine had been selected. Therefore, the obtained results confirm the validity of the survey's content, which was developed based on the related literature and the interviews conducted with experts representing the stakeholders of business incubators in the UAE.

Also, the results showed that some of the attributes in some internal and external factors had been deleted (four attributes). The final results of the factor analysis, which shows that the deleted within the three factors (Availability of infrastructure and services, Commercialisation conditions, and market conditions in terms of

collaboration level with the incubators). The remaining factors have no changes and were found to be valid in terms of content and construct. As a result, achieving these results have helped in running the Cronbach's' Alpha reliability analysis on the data collection tool. Table 33 shows the final generated results from factor analysis.

Table 33: Results of conducting factor analysis

	N of items		
	Before	**After***	**Decision**
Internal Factors contribute to the success of Business Incubator			
F1. Level of availability of these factors in a business incubator	3	2	1 item deleted
F2. Business incubators level of accessibility to	4	4	No changes
F3. Level of qualification and experience of Business Incubators management and technical team	4	4	No changes
F4. Level of the capability of a business incubator	4	3	1 item deleted
External Factors contribute to the success of Business Incubator			
F5. Level of governmental support for a business incubator with	4	4	No changes
F6. Level of availability of financial resources for a abusiness incubator	5	5	No changes
F7. Level of the collaboration of business incubator with	4	2	2 items deleted
F8. Opinion regarding the entrepreneurship culture in the UAE in	4	4	No changes
Success indices of Business Incubators in the UAE			
F9. Level of the success of business incubator in	4	4	No changes
Role of Business Incubators in Supporting Entrepreneurial Practices in the UAE			
F10. Reason to choose to move into a business incubator	4	4	No changes
F11. Importance of business incubator in	6	6	No changes

* Extraction Method: Principal Component Analysis.

* Rotation Method: Varimax with Kaiser Normalization.

5.4.2.3 Results of Reliability Analysis

The reliability analysis is conducted to assess the internal consistency using Cronbach's Alpha, which measures the relations between the different items (attributes) of the same scale (success factor) based on the average inter-item correlation. The results indicate high-reliability levels for the internal factors (Cronbach's Alpha is 0.938) as well as for the external factors (Cronbach's Alpha is 0.919) that contribute to the success of business incubation scale. However, it is worth mentioning that there is no standard cut-off point to be used for judging reliability.

In this regard, Sekaran, (2003) sets the point of (0.500) as a minimum score to be considered reliable. Therefore, in this study, a reliability coefficient (index) that exceeds the point of (0.500) will be considered acceptable. On the other hand, the results showed that the reliability indices of the attributes of each factor ranged from high-reliability level (0.726) to very high-reliability level (0.974) indicating the adopted survey using reliable measures to be used in the UAE context. Table 34 shows the reliability analysis results.

Table 34: Results of conducting Cronbach's Alpha reliability test

	Reliability Statistics		
	N	**Cronbach's Alpha**	**N of Items**
Internal Factors contribute to the success of Business Incubator:	**85**	**.938**	**13**
F1. Level of availability of these factors in a business incubator	85	.726	2
F2. Accessibility level of Business incubators	85	.870	4
F3. Level of qualification and experience of Business Incubators management and technical team	85	.880	4
F4. Level of the capability of a business incubator	85	.849	3

Table 34: Results of conducting Cronbach's Alpha reliability test (Continued)

		Reliability Statistics	
	N	**Cronbach's Alpha**	**N of Items**
External Factors contribute to the success of Business Incubator:	**85**	**.919**	**15**
F5. Level of governmental support for a business incubator with	85	.907	4
F6. Level of availability of financial resources for a business incubator	85	.783	5
F7. Level of the collaboration of business incubator	85	.845	2
F8. Opinion regarding the entrepreneurship culture in the UAE	85	.894	4
Success indices of Business incubators in the UAE:			
F9. Level of success of business incubator	85	.924	4
Role of Business Incubators in Supporting Entrepreneurial Practices in the UAE:			
F10. Reason to choose to move into a business incubator	52	.887	4
F11. Importance of business incubator	85	.944	6

Also, the reported reliability indices showed that they vary in terms of strength. Some of the indices were close to one (1.000), which indicates that the instrument is robust in terms of time and place, and most importantly, the result indicates that both the management of incubators (BI) and their incubated entrepreneurs (IE) were well aware of what has been measured. Moreover, these two indices indicate that the data collected are reliable and the statistical analyses can be performed on the investigated data. As a result, these findings imply that the experts were familiar with the internal and external factors that contribute to the success of the incubators in the UAE, which has been considered by some of the incubations' studies conducted within the GCC domain.

5.4.2.4 Results of Internal Success Factors of Incubators

i] *The infrastructure of the Business Incubator*:

In addition to the value-added services and infrastructure facilities offered to incubate entrepreneurs, it is expected from incubator to have an entry and exit criteria as well as joining contract. This is to assure accepting quality candidates and to be governed by a contract in order to manage the incubators effectively and efficiently. Thus, when asking the management of incubators whether they have an entry and exit criteria for their incubators, the results, as mentioned in Table 35, showed that (48.5%) and (21.2%) of respondents have mentioned that it was highly available and available, respectively. However, when asking the same questions for incubated entrepreneurs, the result revealed that their views were not highly aligned with the management of the incubators. (30.8%) moreover, (26.9%) of Entrepreneurs who were incubated felt having entry, and exit criteria are either moderately available or available at the incubator.

Table 35: Availability of infrastructure at the business incubators in the UAE

F1. Level of availability of these factors in business incubator

	Source	Sample size	Not available	Slightly available	Moderately available	Available	Highly Available	Mean Value	Mean %	Mean S.D	Availability level	t-test results t-value	df	Sig.
A. Has entry and exit criteria.														
	B I	33	1 (3.0%)	1 (3.0%)	8 (24.2%)	7 (21.2%)	16 (48.5%)	4.09	(81.8%)	1.071	**Highly**	3.006	83	.003**
	I E	52	7 (13.5%)	5 (9.6%)	16 (30.8%)	14 (26.9%)	10 (19.2%)	3.29	(65.8%)	1.273	**Available**			
	All	85	8 (9.4%)	6 (7.1%)	24 (28.2%)	21 (24.7%)	26 (30.6%)	3.60	(72.0%)	1.255	**Highly**			
B. Has contracts for their incubatees.														
	B I	33	5 (15.2%)	3 (9.1%)	3 (9.1%)	5 (15.2%)	17 (51.5%)	3.79	(75.8%)	1.536	**Highly**	1.011	83	.315
	I E	52	7 (13.5%)	5 (9.6%)	14 (26.9%)	9 (17.3%)	17 (32.7%)	3.46	(69.2%)	1.393	**Available**			
	All	85	12 (14.1%)	8 (9.4%)	17 (20.0%)	14 (16.5%)	34 (40.0%)	3.59	(71.8%)	1.450	**Highly**			
F1. Overall Level of availability of these factors in business incubator														
	B I	33						3.94	(78.8%)	1.197	**Highly**	2.156	83	.034*
	I E	52						3.38	(67.6%)	1.163	**Available**			
	All	85						3.59	(71.8%)	1.201	**Highly**			

** the value is significant at alpha = 0.010

As far as having contracts for incubated entrepreneurs, it was found that both views (management of incubators and incubated entrepreneurs) were somehow aligned in terms of having contracts. The results of the survey showed that (51.5%) of incubation management stated with "highly available" for having contracts, while (32.7%) entrepreneurs agreed with the high availability of contracts at the incubator. As a result, looking into the overall availability of the infrastructure factor at the business incubators in the UAE, Figure 6 shows that the views of incubation management (72%) and incubated entrepreneurs (71.8%) were almost aligned in the existence of having entry and exit criteria as well as joining contract by the business incubators in the UAE.

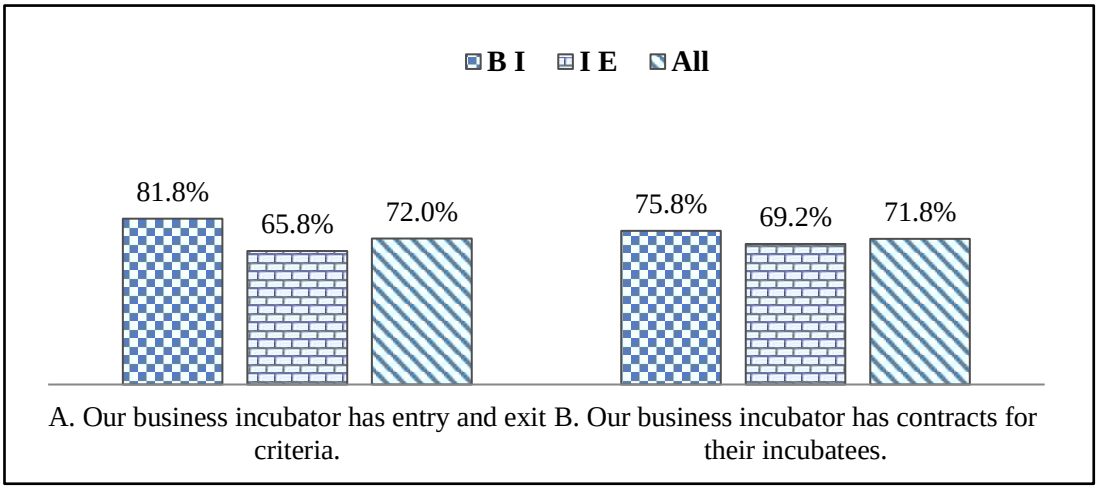

Figure 6: Availability of infrastructure at the incubators in the UAE

ii] *Networking of the Business Incubator*:

Studies showed that networking activities is a critical and efficient tool for incubators to succeed. The activities of networking may include access to knowledge sources, fund, customers, and even to expertise that can support the development of entrepreneurial projects. As such, the survey questionnaire wanted to check with both categories of respondents (management of incubators and incubated entrepreneurs) on the current activities of networking within the existed incubators in the UAE. As seen

from the table (36), (48.5%) of incubator management has indicated the business incubators as highly accessible to information sources, while only (34.6%) incubated entrepreneurs have claimed that the business incubators as highly accessible to information sources.

As far as the accessibility to expertise, it was found that 45.5% of incubator management' respondents claimed that the incubators are highly accessible comparing to only 28.8% of respondents from incubated entrepreneurs' category. With regards to the accessibility to funding sources, and as shown in Table 36, the results showed that 39.4% and 30.3% of incubation management have stated that business incubators are either accessible or highly accessible respectively. However, when the entrepreneurs have been asked this question, it was noticed that only 28.8% and 9.6% have stated that incubators are accessible and highly accessible to fund sources. Moreover, 15.4% of incubated entrepreneurs have stated that incubators are not accessible to fund sources, which reveals the overall challenge of accessing to fund by both categories.

Table 36: Networking accessibility level of the incubators in the UAE

F2. Business incubators level of accessibility to …

Source	Sample size	Not accessible	Slightly accessible	Moderately accessible	Accessible	Highly accessible	Mean Value	Mean %	Mean S.D	Accessibility level	t-test results t-value	df	Sig.
A. Information sources.													
B I	33	1 (3.0%)	0 (0.0%)	5 (15.2%)	11 (33.3%)	16 (48.5%)	4.24	(84.8%)	0.936	**Highly**	2.429	83	.017*
I E	52	4 (7.7%)	9 (17.3%)	9 (17.3%)	12 (23.1%)	18 (34.6%)	3.60	(71.9%)	1.332	**Highly**			
All	85	5 (5.9%)	9 (10.6%)	14 (16.5%)	23 (27.1%)	34 (40.0%)	3.85	(76.9%)	1.230	**Highly**			
B. Expertise in targeted fields.													
B I	33	1 (3.0%)	1 (3.0%)	5 (15.2%)	11 (33.3%)	15 (45.5%)	4.15	(83.0%)	1.004	**Highly**	2.106	83	.038*
I E	52	4 (7.7%)	5 (9.6%)	13 (25.0%)	15 (28.8%)	15 (28.8%)	3.62	(72.3%)	1.223	**Highly**			
All	85	5 (5.9%)	6 (7.1%)	18 (21.2%)	26 (30.6%)	30 (35.3%)	3.82	(76.5%)	1.167	**Highly**			
C. Fund sources.													
B I	33	2 (6.1%)	4 (12.1%)	4 (12.1%)	13 (39.4%)	10 (30.3%)	3.76	(75.2%)	1.200	**Highly**	2.867	83	.005**
I E	52	8 (15.4%)	10 (19.2%)	14 (26.9%)	15 (28.8%)	5 (9.6%)	2.98	(59.6%)	1.229	**Accessible**			
All	85	10 (11.8%)	14 (16.5%)	18 (21.2%)	28 (32.9%)	15 (17.6%)	3.28	(65.6%)	1.269	**Accessible**			
D. Targeted customers.													
B I	33	1 (3.0%)	1 (3.0%)	6 (18.2%)	14 (42.4%)	11 (33.3%)	4.00	(80.0%)	0.968	**Highly**	2.819	83	.006**
I E	52	5 (9.6%)	7 (13.5%)	15 (28.8%)	17 (32.7%)	8 (15.4%)	3.31	(66.2%)	1.181	**Accessible**			
All	85	6 (7.1%)	8 (9.4%)	21 (24.7%)	31 (36.5%)	19 (22.4%)	3.58	(71.5%)	1.148	**Highly**			
F2. Overall Business incubators level of accessibility to …													
B I	33						4.04	(80.8%)	0.880	**Highly**	3.056	83	.003**
I E	52						3.38	(67.6%)	1.030	**Accessible**			
All	85						3.63	(72.6%)	1.022	**Highly**			

** the value is significant at alpha = 0.010

* the value is significant at alpha = 0.050

When both categories of respondents were asked about their perception of incubators' accessibility to targeted customers, the results in Table 36 are showing that 42.4% and 33.3% of incubation management have stated that incubators are accessible or highly accessible to targeted customers respectively. In terms of the view of incubated entrepreneurs, 28.8% and 32.7% of them have stated that the accessibility of business incubators is moderately accessible or accessible to targeted customers respectively.

Finally, looking into the overall networking accessibility level of incubators in the UAE, when combining the results of both categories of respondents, as shown in Figure 7, it was found that business incubators can access information sources (76.9%), while they are facing some challenges in terms of accessing to fund (65.6%) and to access targeted customers (71.5%).

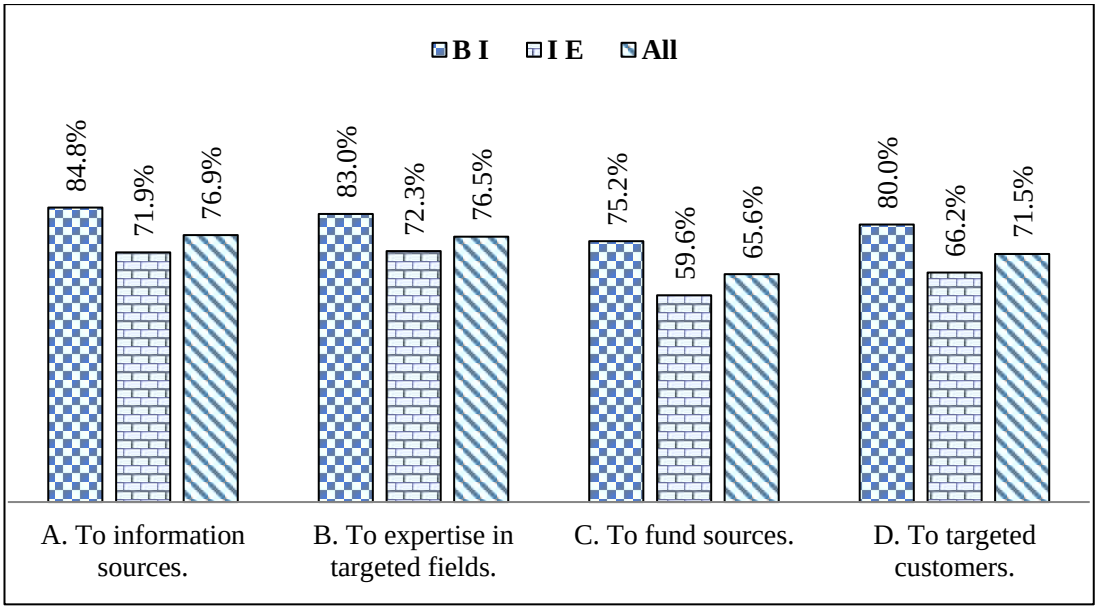

Figure 7: Networking accessibility level of the incubators in the UAE

iii] *Human Resources of the Business Incubators*:

Several studies have addressed the role of human resource in operating the business incubators. Thus, this study has considered human resources as one of the internal enablers for business incubators to succeed. In this regard, when the survey of the study asked the incubated entrepreneurs about the qualification and experience level of the management team and technical team at the business incubators, 26.9% and 40.4% of respondents stated that management team is qualified or highly qualified respectively, as shown in Table 37. In terms of the experience level of management teams, the incubated entrepreneurs indicated that the management is either experienced (26.9%) or highly experienced (42.3%) to reveal that the current management is qualified and experienced to operate the business incubators in the UAE.

As far as the qualification and experience levels of the technical team at the business incubators in the UAE, the results showed that 25.0% and 28.8% of incubated entrepreneurs felt that the technical team are qualified or highly qualified respectively as seen in Table 37. In terms of the experience level of the technical team at the incubators in the UAE, incubated entrepreneurs stated that they are experienced (32.7%) or highly experienced (25.0%) based on what they witnessed at the incubators in the UAE.

Table 37: Qualification and experience of incubators' management team in the UAE

F3. Level of qualification and experience of Business Incubators' management and technical team

	Sample						Mean			Qualification	t-test results		
	Source	size	Very low	Low	Average	High	Very high	Value	%	S. D	level	t-value	df	Sig.
A. The qualification of management team.														
	B I	33	1 (3.0%)	1 (3.0%)	5 (15.2%)	7 (21.2%)	19 (57.6%)	4.27	(85.5%)	1.039	**Very high**	1.719	83	.089
	I E	52	5 (9.6%)	4 (7.7%)	8 (15.4%)	14 (26.9%)	21 (40.4%)	3.81	(76.2%)	1.314	**Very high**			
	All	85	6 (7.1%)	5 (5.9%)	13 (15.3%)	21 (24.7%)	40 (47.1%)	3.99	(79.8%)	1.230	**Very high**			
B. The Experience of management team.														
	B I	33	1 (3.0%)	1 (3.0%)	3 (9.1%)	11 (33.3%)	17 (51.5%)	4.27	(85.5%)	0.977	**Very high**	1.558	83	.123
	I E	52	4 (7.7%)	5 (9.6%)	7 (13.5%)	14 (26.9%)	22 (42.3%)	3.87	(77.3%)	1.284	**Very high**			
	All	85	5 (5.9%)	6 (7.1%)	10 (11.8%)	25 (29.4%)	39 (45.9%)	4.02	(80.5%)	1.185	**Very high**			
C. The qualification of technical team.														
	B I	33	1 (3.0%)	0 (0.0%)	7 (21.2%)	8 (24.2%)	17 (51.5%)	4.21	(84.2%)	0.992	**Very high**	2.748	83	.007**
	I E	52	2 (3.8%)	13 (25.0%)	9 (17.3%)	13 (25.0%)	15 (28.8%)	3.50	(70.0%)	1.260	**Very high**			
	All	85	3 (3.5%)	13 (15.3%)	16 (18.8%)	21 (24.7%)	32 (37.6%)	3.78	(75.5%)	1.209	**Very high**			
D. The experience of technical team.														
	B I	33	1 (3.0%)	1 (3.0%)	5 (15.2%)	11 (33.3%)	15 (45.5%)	4.15	(83.0%)	1.004	**Very high**	2.660	83	.009**
	I E	52	4 (7.7%)	12 (23.1%)	6 (11.5%)	17 (32.7%)	13 (25.0%)	3.44	(68.8%)	1.305	**High**			
	All	85	5 (5.9%)	13 (15.3%)	11 (12.9%)	28 (32.9%)	28 (32.9%)	3.72	(74.4%)	1.240	**Very high**			
F3. Overall level of qualification and experience of Business Incubators' management and technical team														
	B I	33						4.23	(84.6%)	0.936	**Very high**	2.551	83	.013*
	I E	52						3.65	(73.0%)	1.054	**Very high**			
	All	85						3.88	(77.6%)	1.043	**Very high**			

** the value is significant at alpha = 0.010

* the value is significant at alpha = 0.050

Thus, looking at the overall levels of qualifications and experience of management and technical teams at the incubators in the UAE, it will be noticed a slight difference between the views of management of incubators comparing to the incubated entrepreneurs. Nevertheless, when aggregating the views of the two respondents' categories, as seen in Figure 8, the results showing the qualifications and experiences of incubation management scored an average of 80.0%, while the views of incubated entrepreneurs only showed an average of 77.0%, which did not vary much from the views of the aggregate views.

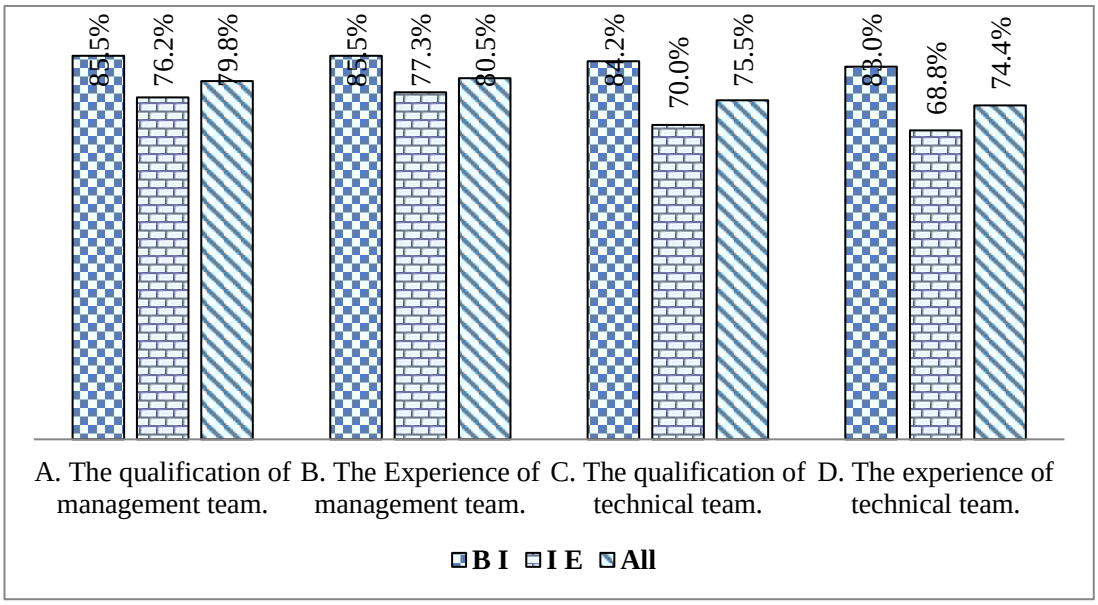

Figure 8: Qualification and experience of incubators' management and technical team

With regards to the overall levels of qualifications and experiences of the technical team at the incubators in the UAE, Figure 8 shows there are more differences among the views of incubation management and incubated entrepreneurs. Although the result showed that the overall score of both views was around 75.0%, it was noticed that incubated entrepreneurs rated in aggregate 70.0% for the qualifications of the technical team and 68.8% for the experiences of the technical team at the incubators in the UAE.

iv] *Commercialisation Conditions*:

Commercialisation conditions are referred to the capability level of business incubators to generate ideas, testing the feasibility of launching new products and services and supporting incubated entrepreneurs to protect their intellectual property rights. Therefore, when incubation management was asked about views about the incubation's capability for generating and assessing entrepreneurial ideas, the result showing 21.2% and 60.6% of respondents answered with either capable or highly capable respectively, while incubated entrepreneurs' respondents stated that they are capable (44.2%) or highly capable (32.7%) as shown in Table 38.

In terms of the capability of testing concepts and assessing the feasibility of new products and services, and as seen in Table 38, it was found that 36.4% and 42.4% of respondents from incubation management stated that they are either capable or highly capable respectively. When incubated entrepreneurs were asked the same question, the results showing 36.5% and 26.9% of the participants believed that incubators are either capable or highly capable, respectively.

Table 38: Commercialisation conditions level of business incubators in the UAE

F4. Level of capability of business incubator in …

	Sample	Not	Low	Acceptable		Highly	Mean			Capability	t-test results		
Source	size	capable	capable	capable	Capable	capable	Value	%	S. D	level	t-value	df	Sig.
A. Generating and assessing entrepreneurial ideas.													
B I	33	1 (3.0%)	1 (3.0%)	4 (12.1%)	7 (21.2%)	20 (60.6%)	4.33	(86.7%)	1.021	**Highly**	1.686	83	.096
I E	52	2 (3.8%)	4 (7.7%)	6 (11.5%)	23 (44.2%)	17 (32.7%)	3.94	(78.8%)	1.056	**Highly**			
All	85	3 (3.5%)	5 (5.9%)	10 (11.8%)	30 (35.3%)	37 (43.5%)	4.09	(81.9%)	1.054	**Highly**			
B. Testing concepts and assessing the feasibility of new products/ services.													
B I	33	1 (3.0%)	1 (3.0%)	5 (15.2%)	12 (36.4%)	14 (42.4%)	4.12	(82.4%)	0.992	**Highly**	1.651	83	.103
I E	52	3 (5.8%)	3 (5.8%)	13 (25.0%)	19 (36.5%)	14 (26.9%)	3.73	(74.6%)	1.105	**Highly**			
All	85	4 (4.7%)	4 (4.7%)	18 (21.2%)	31 (36.5%)	28 (32.9%)	3.88	(77.6%)	1.074	**Highly**			
C. Supporting intellectual property protection.													
B I	33	3 (9.1%)	5 (15.2%)	7 (21.2%)	5 (15.2%)	13 (39.4%)	3.61	(72.1%)	1.391	**Highly**	1.436	83	.155
I E	52	2 (3.8%)	15 (28.8%)	12 (23.1%)	16 (30.8%)	7 (13.5%)	3.21	(64.2%)	1.126	**Capable**			
All	85	5 (5.9%)	20 (23.5%)	19 (22.4%)	21 (24.7%)	20 (23.5%)	3.36	(67.3%)	1.243	**Capable**			
F4. Overall level of capability of business incubator in …													
B I	33						4.02	(80.4%)	0.931	**Highly**	1.808	83	.074
I E	52						3.63	(72.6%)	1.000	**Highly**			
All	85						3.78	(75.6%)	0.987	**Highly**			

With regards to supporting incubated entrepreneurs for IP protection by the incubators in the UAE, and as per Table 38, the result showing 15.2% and 39.4% of incubation management responded with either capable or highly capable, respectively. As far as the views of incubated entrepreneurs for the same question, their perception of incubation's capabilities was lower as they stated that incubation management is either capable (30.8%) or highly capable (13.5%). Also, 28.8% of respondents from incubated entrepreneurs' felt that incubators have low capabilities for supporting them in the intellectual property protection process.

Thus, when analysing the results of overall commercialization capability levels at business incubators in the UAE, it will be noticed that generating and assessing entrepreneurial ideas were scored the highest level of incubators' capability (81.9%), while the capability of incubators to support IP protection scored the lowest level (67.3%), as seen in Figure 9, which reveals that business incubators need to perform better in providing intellectual protection services for their tenants.

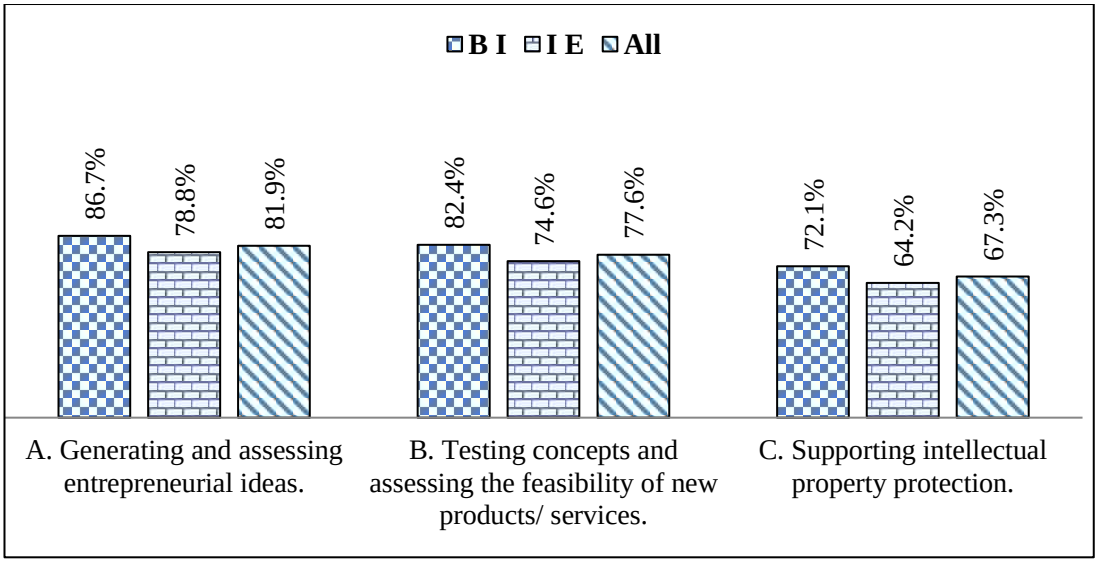

Figure 9: Commercialisation capability level of incubators in the UAE

5.4.2.5 Results of the External Success Factors of Incubators

i] *Government Support*:

This is study seeks to evaluate the current government support in terms of conducive policies, incentives offered for incubators, intellectual protection services, and accessibility to funding sources. As such, it was found that 39.4% and 27.3% of business incubation management believe that government policies in the UAE are either providing good support or excellent support respectively. When asking incubated entrepreneurs about their perception of government policies that supports business incubation, 26.9% and 25.0% of respondents perceived the support of government policies for business incubators as either excellent support or very good support.

With regards to incentives offered by the government for business incubators, the result showed that 36.4% and 24.2% of the incubators' management respondents stated they government is either providing good support or very good support respectively. However, it is worth mentioning that 18.2% of incubators' management respondents felt that the government is not supporting the incubators in terms of the incentives for them to succeed. Table 39 summarised the results of government support levels for incubators in the UAE.

Table 39: Government support level for the business incubators in the UAE

F5. Level of governmental support for business incubator with …

	Source	Sample size	No support	Acceptable support	Good support	Very Good support	Excellent support	Mean Value	Mean %	Mean S. D	Support level	t-test results t-value	df	Sig.
A. Policies.														
	B I	33	2 (6.1%)	2 (6.1%)	13 (39.4%)	7 (21.2%)	9 (27.3%)	3.58	(71.5%)	1.146	**Excellent**	.542	83	.589
	I E	52	6 (11.5%)	7 (13.5%)	12 (23.1%)	13 (25.0%)	14 (26.9%)	3.42	(68.5%)	1.334	**Very Good**			
	All	85	8 (9.4%)	9 (10.6%)	25 (29.4%)	20 (23.5%)	23 (27.1%)	3.48	(69.6%)	1.259	**Very Good**			
B. Incentives.														
	B I	33	6 (18.2%)	2 (6.1%)	12 (36.4%)	8 (24.2%)	5 (15.2%)	3.12	(62.4%)	1.293	**Very Good**	-.113	83	.910
	I E	52	7 (13.5%)	9 (17.3%)	15 (28.8%)	11 (21.2%)	10 (19.2%)	3.15	(63.1%)	1.304	**Very Good**			
	All	85	13 (15.3%)	11 (12.9%)	27 (31.8%)	19 (22.4%)	15 (17.6%)	3.14	(62.8%)	1.292	**Very Good**			
C. IP protection services.														
	B I	33	4 (12.1%)	4 (12.1%)	11 (33.3%)	8 (24.2%)	6 (18.2%)	3.24	(64.8%)	1.251	**Very Good**	1.139	83	.258
	I E	52	8 (15.4%)	12 (23.1%)	15 (28.8%)	10 (19.2%)	7 (13.5%)	2.92	(58.5%)	1.266	**Very Good**			
	All	85	12 (14.1%)	16 (18.8%)	26 (30.6%)	18 (21.2%)	13 (15.3%)	3.05	(60.9%)	1.262	**Very Good**			
D. Access to fund.														
	B I	33	4 (12.1%)	5 (15.2%)	5 (15.2%)	8 (24.2%)	11 (33.3%)	3.52	(70.3%)	1.417	**Excellent**	1.475	83	.144
	I E	52	7 (13.5%)	11 (21.2%)	13 (25.0%)	13 (25.0%)	8 (15.4%)	3.08	(61.5%)	1.281	**Very Good**			
	All	85	11 (12.9%)	16 (18.8%)	18 (21.2%)	21 (24.7%)	19 (22.4%)	3.25	(64.9%)	1.344	**Very Good**			
F5. Overall level of governmental support for business incubator with …														
	B I	33						3.36	(67.2%)	1.102	**Very Good**	.863	83	.391
	I E	52						3.14	(62.8%)	1.167	**Very Good**			
	All	85						3.23	(64.6%)	1.141	**Very Good**			

As far as government's support in terms of intellectual property services, the results showed that the management of incubators rated IP services support as good support (33.3%) and very good support (24.2%), while incubated entrepreneurs' respondents felt that the level of intellectual property services support offered by the government is good (28.8%) and acceptable (23.1%). However, 15.4% of the respondents from incubated entrepreneurs believed that the government is not supporting the incubators for providing intellectual property services as seen in Table 39.

Finally, when asking the respondents about the support level of government in helping business incubators to access fund sources, the respondents from incubation management rated such as support as excellent (33.3%) and very good (24.2%), as seen in Table 39. On the other hand, when the respondents from incubated entrepreneurs were asked the same question, though 13.5% of respondents from incubated entrepreneurs felt that government is not supporting incubators in accessing funds, the result showed that 25.0% of them rated government support level for incubators to access fund sources as good and very good.

Therefore, when analysing the overall results of government support level for business incubators in the above four dimensions, it will be noticed that the supportive policies (69.9%) have scored the highest rate among the four dimensions, while the support of intellectual property services (60.9%) scored the lowest among the two categories of respondents as highlighted in Figure 10.

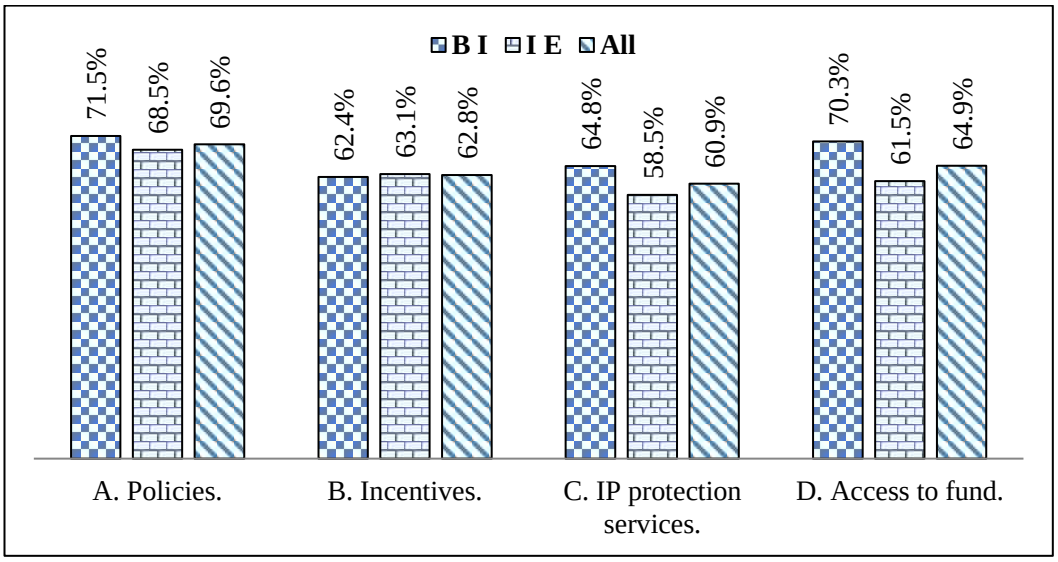

Figure 10: Government support level for the incubators in the UAE

ii] *Financial Resources*:

This study wanted to investigate the availability level of different financial resources for incubators, particularly from the government, private sector, venture capital, banks, and R&D at universities. Based on the analysis of the two surveys, the result showed that 33.3% of incubation management have stated that government fund is not available, comparing to 24.2% of respondents indicating that it is highly available. On the other categories of respondents, when incubated entrepreneurs were asked this question, 25.0% and 23.1% of them have mentioned that government fund is either moderately available or slightly available respectively as highlighted in Table 40.

With regards to the availability level of private sector fund/sponsorship, the result revealed that incubation management stated that this type of fund is highly available (39.4%) or moderately available, while incubated entrepreneurs felt that this type of fund is moderately available (28.8%) or not available (21.2%), as summarised in Table 40. As far as venture capital funds, though this type of fund is considered relatively new in the GCC region, and a Table 40 shows, the survey result revealed that 36.4%

and 24.2% of incubation management' respondents rated venture capital funds as moderately available or highly available respectively in the UAE, while 26.9% of respondents from incubated entrepreneurs indicated that venture capital funds are either not available or moderately available for business incubators in the UAE.

In terms of the availability of banks loans for business incubators in the UAE, and as presented in Table 40, the result showing 57.6% of incubation management has stated this type of fund are not available for incubated entrepreneurs, while only 18.2% of incubation management have stated that banks loans are moderately available. When incubated entrepreneurs were asked to rate the availability of banks loans for business incubation, the result showed that 48.1% and 21.2% of them have indicated that this type of fund is either not available or moderately available respectively for business incubators in the UAE.

Table 40: Financial resources level for the incubators in the UAE

F6. Level of availability of financial resources for business incubator

Source	Sample size	Not available	Slightly available	Moderately available	Available	Highly Available	Mean Value	Mean %	Mean S. D	Availability level	t-test results t-value	df	Sig.
A. Government fund.													
B I	33	11 (33.3%)	2 (6.1%)	6 (18.2%)	6 (18.2%)	8 (24.2%)	2.94	(58.8%)	1.619	**Available**	-.068	83	.946
I E	52	9 (17.3%)	12 (23.1%)	13 (25.0%)	8 (15.4%)	10 (19.2%)	2.96	(59.2%)	1.371	**Available**			
All	85	20 (23.5%)	14 (16.5%)	19 (22.4%)	14 (16.5%)	18 (21.2%)	2.95	(59.1%)	1.463	**Available**			
B. Private sector funds/ sponsorship.													
B I	33	1 (3.0%)	5 (15.2%)	8 (24.2%)	6 (18.2%)	13 (39.4%)	3.76	(75.2%)	1.226	**Highly**	3.285	83	.001**
I E	52	11 (21.2%)	11 (21.2%)	15 (28.8%)	7 (13.5%)	8 (15.4%)	2.81	(56.2%)	1.344	**Available**			
All	85	12 (14.1%)	16 (18.8%)	23 (27.1%)	13 (15.3%)	21 (24.7%)	3.18	(63.5%)	1.373	**Available**			
C. Venture capital funds.													
B I	33	5 (15.2%)	5 (15.2%)	12 (36.4%)	3 (9.1%)	8 (24.2%)	3.12	(62.4%)	1.364	**Available**	1.029	83	.307
I E	52	14 (26.9%)	6 (11.5%)	14 (26.9%)	12 (23.1%)	6 (11.5%)	2.81	(56.2%)	1.373	**Available**			
All	85	19 (22.4%)	11 (12.9%)	26 (30.6%)	15 (17.6%)	14 (16.5%)	2.93	(58.6%)	1.370	**Available**			
D. Banks loans.													
B I	33	19 (57.6%)	3 (9.1%)	6 (18.2%)	2 (6.1%)	3 (9.1%)	2.00	(40.0%)	1.369	**Moderately**	-.447	83	.656
I E	52	25 (48.1%)	8 (15.4%)	11 (21.2%)	3 (5.8%)	5 (9.6%)	2.13	(42.7%)	1.344	**Moderately**			
All	85	44 (51.8%)	11 (12.9%)	17 (20.0%)	5 (5.9%)	8 (9.4%)	2.08	(41.6%)	1.347	**Moderately**			
E. R&D funds at universities													
B I	33	15 (45.5%)	7 (21.2%)	3 (9.1%)	5 (15.2%)	3 (9.1%)	2.21	(44.2%)	1.409	**Moderately**	-.435	83	.665
I E	52	20 (38.5%)	11 (21.2%)	9 (17.3%)	7 (13.5%)	5 (9.6%)	2.35	(46.9%)	1.370	**Moderately**			
All	85	35 (41.2%)	18 (21.2%)	12 (14.1%)	12 (14.1%)	8 (9.4%)	2.29	(45.9%)	1.379	**Moderately**			
F6. Overall level of availability of financial resources for business incubator													
B I	33	15					2.81	(56.2%)	0.908	**Moderately**	.860	83	.392
I E	52	20					2.61	(52.2%)	1.079	**Moderately**			
All	85	35					2.69	(53.8%)	1.015	**Moderately**			

** the value is significant at alpha ≤ 0.010

Finally, when both categories of respondents have been asked to rate the availability of R&D funds at universities for business incubators in the UAE, the results showed that 45.5% and 21.2% of incubators' management respondents have stated that this type of fund is either not available or slightly available respectively for the incubators in the UAE. In terms of the perception of incubated entrepreneurs, the respondents claimed that R&D funds at universities are either not available (38.5%) or slightly available (21.2%) for the incubators in the UAE.

As a result, when looking into the overall analysis on different financial resources that can be offered to business incubators, and as summarized in Figure 11, the result showed that incubators are relying more on private sector as a source of fund (63.5%) comparing to government sources (59.1%) based on the views of both categories of respondents, while banks loans were rated as the lowest option that can be available for incubators (41.6%) in the UAE.

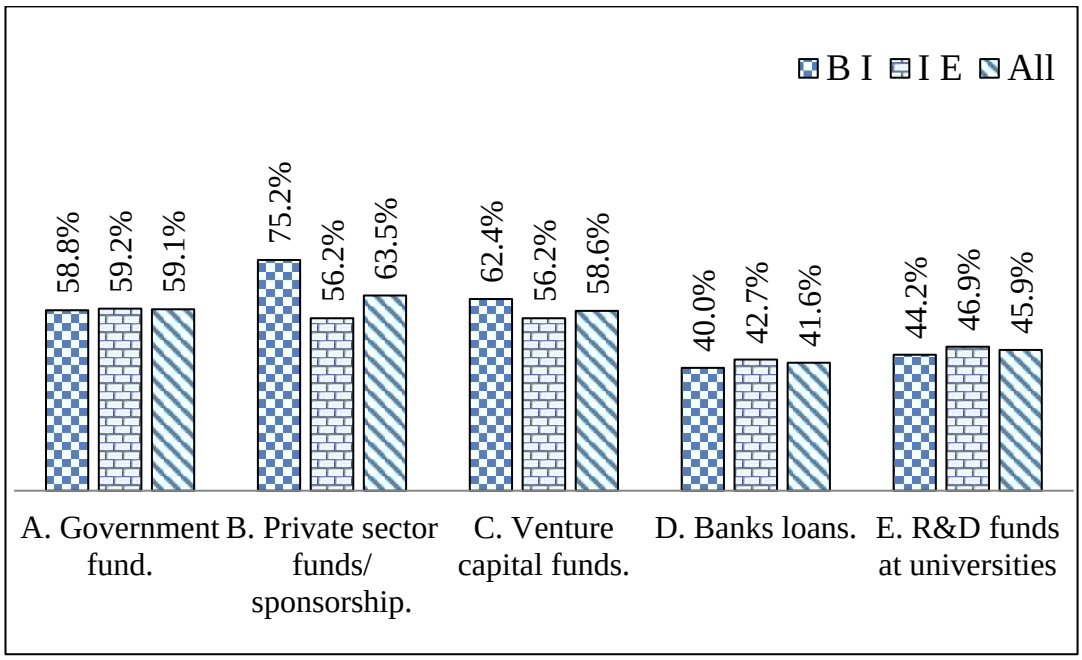

Figure 11: Financial resources level for the incubators in the UAE

iii] *Market Condition*:

Market condition factor seeks to evaluate the collaboration level of incubators with two main stakeholders; universities and respective industry developers. Thus, this research needed to investigate the level of collaboration between business incubators in the UAE and universities as well as respective industry developers. As seen in Table 41, the survey result revealed that respondents from incubation management have rated the collaboration with universities as either very good collaboration (30.3%) or excellent collaboration (27.3%), while 30.8% and 19.2% of respondents from incubated entrepreneurs' category have rated the collaboration with universities as either very good collaboration or excellent collaboration respectively.

With regards to the collaboration level between business incubators and respective industry developers, the result showed that the responses from incubation management were either outstanding collaboration (33.3%) or excellent collaboration (30.3%). When incubated entrepreneurs were asked to rate the collaboration level with respective industry developers, it was noticed that their responses were quite lower in terms of the level of collaboration; the respondents from incubated entrepreneurs felt that the level of collaboration with respective industry developers was either very good (26.9%) or acceptable (21.2%), as seen in Table 41.

Table 41: Collaboration level for the business incubators in the UAE

F7. Level of collaboration of business incubator with…

	Source	Sample size	No collaborate	Acceptable collaborate	Good collaborate	Very good collaborate	Excellent collaborate	Mean Value	Mean (%	Mean S. D	Collaborate level	t-test results t-value	df	Sig.
A. Universities.														
	B I	33	3 (9.1%)	3 (9.1%)	8 (24.2%)	10 (30.3%)	9 (27.3%)	3.58	(71.5%)	1.251	**Excellent**	1.188	83	.238
	I E	52	7 (13.5%)	10 (19.2%)	9 (17.3%)	16 (30.8%)	10 (19.2%)	3.23	(64.6%)	1.337	**Very good**			
	All	85	10 (11.8%)	13 (15.3%)	17 (20.0%)	26 (30.6%)	19 (22.4%)	3.36	(67.3%)	1.308	**Very good**			
B. Respective industry developers.														
	B I	33	1 (3.0%)	2 (6.1%)	9 (27.3%)	11 (33.3%)	10 (30.3%)	3.82	(76.4%)	1.044	**Excellent**	2.349	83	.021*
	I E	52	7 (13.5%)	11 (21.2%)	10 (19.2%)	14 (26.9%)	10 (19.2%)	3.17	(63.5%)	1.339	**Very good**			
	All	85	8 (9.4%)	13 (15.3%)	19 (22.4%)	25 (29.4%)	20 (23.5%)	3.42	(68.5%)	1.267	**Very good**			
F7. Overall Level of collaboration of business incubator with…														
	B I	33						3.70	(74.0%)	0.976	**Excellent**	1.885	83	.063
	I E	52						3.20	(64.0%)	1.292	**Very good**			
	All	85						3.39	(67.8%)	1.198	**Very good**			

* the value is significant at alpha ≤ 0.050

When looking into the analysis of the overall level of collaboration between incubators in the UAE with two of their stakeholders. The results are showing slight variations in views among both categories of respondents in terms of the level of collaboration. As highlighted in Figure 12, it was noticed that the overall level of collaboration between business incubators and universities scored (67.3%), while the collaboration level with respective industry developers scored (68.5%), which reveals that more efforts need to be conducted to enhance the level of collaboration in order to reflect positively on the success of business incubators in the UAE.

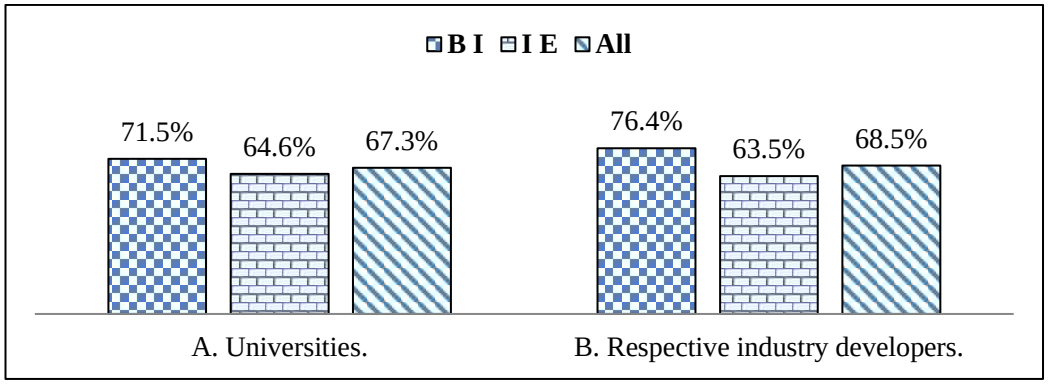

Figure 12: Collaboration level for the incubators in the UAE

iv] *Entrepreneurship Culture*:

Entrepreneurship culture has many dimensions to be addressed. In this study, the survey questions wanted to assess some specific dimensions that may influence the success of business incubators in the UAE. Table 42 summarises those dimensions based on the views of two categories of respondents; incubation management and incubated entrepreneurs. In terms of identifying novel ideas in the UAE, 42.4% of respondents from incubation management category gave an “average” rate for identifying novel ideas by the entrepreneurs in the UAE, while 30.8% of respondents

from incubated entrepreneurs' category rated "high" for identifying novel ideas by the entrepreneurs in UAE domain.

As far as the level of taking a risk by existed entrepreneurs in the UAE, the analysis of the survey results showed that both categories of respondents (incubation management and incubated entrepreneurs) felts that entrepreneurs in the UAE have an "*average*" level of risk-taking. Also, Table 42 shows to what extent entrepreneurs in the UAE can identify future opportunities from the lens of incubation management and incubated entrepreneurs. The result showed that 33.3% of incubation management respondents stated that entrepreneurs in the UAE have an "*average*" level of identifying future opportunities, while responses from incubated entrepreneurs had somehow higher expectations by giving entrepreneurs a "*high*" level of identifying future opportunities (40.4%).

Finally, when both categories were asked to rate the willingness of entrepreneurs to be nurtured within business incubators in the UAE, the result showed that 36.4% and 27.3% of incubation management respondents' rated the willingness of entrepreneurs to be nurtured within business incubators as either "*high*" or "*average*" respectively, while respondents from incubated entrepreneurs felt that the willingness of entrepreneurs to be nurtured within business incubation in the UAE were either "*high*" 30.8% or "*very high*" (25.0%) as shown in Table 42.

Table 42: Opinions regarding entrepreneurship culture in the UAE

F8. Opinion regarding the entrepreneurship culture in the UAE in …

	Sample						Mean			Culture	t-test results		
	Source	size	Very low	Low	Average	High	Very high	Value	%	S. D	level	t-value	df	Sig.
A. Identifying novel ideas.														
	B I	33	2 (6.1%)	3 (9.1%)	14 (42.4%)	8 (24.2%)	6 (18.2%)	3.39	(67.9%)	1.088	**High**	.182	83	.856
	I E	52	5 (9.6%)	8 (15.4%)	13 (25.0%)	16 (30.8%)	10 (19.2%)	3.35	(66.9%)	1.235	**High**			
	All	85	7 (8.2%)	11 (12.9%)	27 (31.8%)	24 (28.2%)	16 (18.8%)	3.36	(67.3%)	1.174	**High**			
B. Risk taking.														
	B I	33	4 (12.1%)	7 (21.2%)	9 (27.3%)	8 (24.2%)	5 (15.2%)	3.09	(61.8%)	1.259	**High**	.644	83	.521
	I E	52	10 (19.2%)	11 (21.2%)	12 (23.1%)	12 (23.1%)	7 (13.5%)	2.90	(58.1%)	1.332	**High**			
	All	85	14 (16.5%)	18 (21.2%)	21 (24.7%)	20 (23.5%)	12 (14.1%)	2.98	(59.5%)	1.300	**High**			
C. Identifying future opportunities.														
	B I	33	1 (3.0%)	3 (9.1%)	11 (33.3%)	9 (27.3%)	9 (27.3%)	3.67	(73.3%)	1.080	**Very high**	1.113	83	.269
	I E	52	4 (7.7%)	9 (17.3%)	10 (19.2%)	21 (40.4%)	8 (15.4%)	3.38	(67.7%)	1.174	**High**			
	All	85	5 (5.9%)	12 (14.1%)	21 (24.7%)	30 (35.3%)	17 (20.0%)	3.49	(69.9%)	1.140	**High**			
D. Willingness to be nurtured within business incubators.														
	B I	33	2 (6.1%)	2 (6.1%)	9 (27.3%)	12 (36.4%)	8 (24.2%)	3.67	(73.3%)	1.109	**Very high**	.881	83	.381
	I E	52	5 (9.6%)	10 (19.2%)	8 (15.4%)	16 (30.8%)	13 (25.0%)	3.42	(68.5%)	1.319	**High**			
	All	85	7 (8.2%)	12 (14.1%)	17 (20.0%)	28 (32.9%)	21 (24.7%)	3.52	(70.4%)	1.240	**Very high**			
F8. Overall opinion regarding the entrepreneurship culture in …														
	B I	33						3.45	(69.0%)	0.985	**High**	.805	83	.423
	I E	52						3.26	(65.2%)	1.105	**High**			
	All	85						3.34	(66.8%)	1.058	**High**			

Thus, based on the overall scores on entrepreneurship culture in for defined dimensions, Figure 13 shows that the views of both categories of respondents fall between 60.0% - 70%, which is entirely above the average.

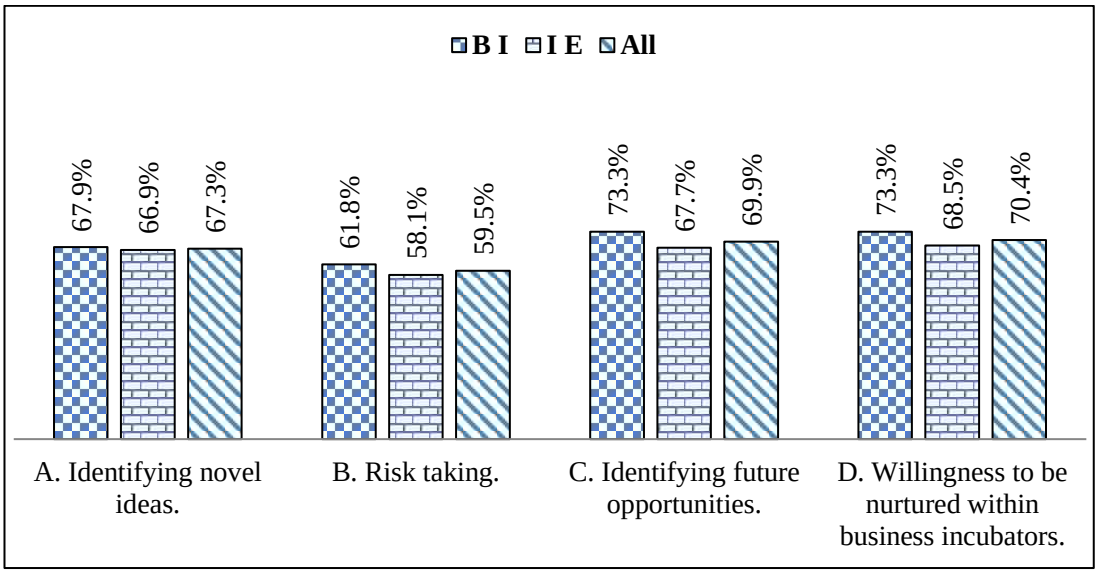

Figure 13: Opinions regarding entrepreneurship culture in the UAE

5.4.2.6 Results of Business Incubations' Success in the UAE

Based on the views of business incubation management and incubated entrepreneurs, this is study aimed to assess how successful the current business incubators are in the UAE from three perspectives; graduating entrepreneurs from the incubators, creating start-ups and sustaining incubated entrepreneurial businesses. Thus, when the survey conducted on participants from incubation management and incubated entrepreneurs. As presented in Table 43, the result showed that 39.4% and 30.3% of respondents from incubation management category have stated that their business incubator is either extremely successful or successful respectively in graduating entrepreneurs. However, the success level of graduating entrepreneurs from the lens of incubated entrepreneurs' perspective was slightly lower; they felt that their business incubators are either

moderately successful 30.8% or successful 25.0%. Besides, 13.5% of incubated entrepreneurs' respondents claimed that their business incubator is not successful.

In terms of the success level of business incubators in creating start-up companies, Table 43 summarised the findings and showed that 45.5% and 39.4% of respondents from incubation management category have stated that they are either successful or extremely successful respectively, while respondents from incubated entrepreneurs' category stated that their business incubator are either successful (38.5%) or extremely successful (21.2%) in creating start-up companies in the UAE.

As far as incubators' level of success for sustaining incubated entrepreneurial businesses, the responses from incubation management and incubated entrepreneurs' categories were somehow aligned. The result showed that the majority of both participants in the two surveys had rated this dimension of incubation's success as either successful or extremely successful. However, when both categories of respondents were asked to rate the overall success level of incubators in the UAE, 42.4% and 33.3% of incubation management responses stated that UAE incubators, in general, are either moderately successful or successful respectively, while 32.7% and 23.1% of respondents from incubated entrepreneurs' category have stated that incubators in general in the UAE are either moderately successful or slightly successful, respectively.

Table 43: Success level of business incubators in the UAE

F9. Level of success of business incubator in …

Source	Sample size	Not successful	Slightly successful	Moderately successful	Successful	Extremely successful	Mean Value	Mean %	Mean S. D	Success Level	t-test results t-value	df	Sig.
A. Graduating entrepreneurs from the incubator.													
B I	33	1 (3.0%)	2 (6.1%)	7 (21.2%)	10 (30.3%)	13 (39.4%)	3.97	(79.4%)	1.075	**Extremely**	2.681	83	.009**
I E	52	7 (13.5%)	6 (11.5%)	16 (30.8%)	13 (25.0%)	10 (19.2%)	3.25	(65.0%)	1.281	**Successful**			
All	85	8 (9.4%)	8 (9.4%)	23 (27.1%)	23 (27.1%)	23 (27.1%)	3.53	(70.6%)	1.250	**Extremely**			
B. Creating start-up companies.													
B I	33	1 (3.0%)	1 (3.0%)	3 (9.1%)	15 (45.5%)	13 (39.4%)	4.15	(83.0%)	0.939	**Extremely**	2.625	83	.010*
I E	52	4 (7.7%)	8 (15.4%)	9 (17.3%)	20 (38.5%)	11 (21.2%)	3.50	(70.0%)	1.213	**Extremely**			
All	85	5 (5.9%)	9 (10.6%)	12 (14.1%)	35 (41.2%)	24 (28.2%)	3.75	(75.1%)	1.154	**Extremely**			
C. Sustaining incubated entrepreneurial businesses.													
B I	33	1 (3.0%)	3 (9.1%)	6 (18.2%)	11 (33.3%)	12 (36.4%)	3.91	(78.2%)	1.100	**Extremely**	1.910	83	.060
I E	52	4 (7.7%)	10 (19.2%)	10 (19.2%)	17 (32.7%)	11 (21.2%)	3.40	(68.1%)	1.241	**Successful**			
All	85	5 (5.9%)	13 (15.3%)	16 (18.8%)	28 (32.9%)	23 (27.1%)	3.60	(72.0%)	1.207	**Extremely**			
F9. Overall level of success of business incubator in …													
B I	33						3.89	(77.8%)	0.882	**Extremely**	2.316	83	.023*
I E	52						3.35	(67.0%)	1.126	**Successful**			
All	85						3.56	(71.2%)	1.065	**Extremely**			

** the value is significant at alpha ≤ 0.010

* the value is significant at alpha ≤ 0.050

With regards to the success level of the three dimensions collectively as presented in Figure 14, it will be noticed that all the three dimensions of success (graduating entrepreneurs from the incubators, creating start-ups, and sustaining incubated entrepreneurial businesses) have exceeded 70.0% based on the views of both categories of respondents.

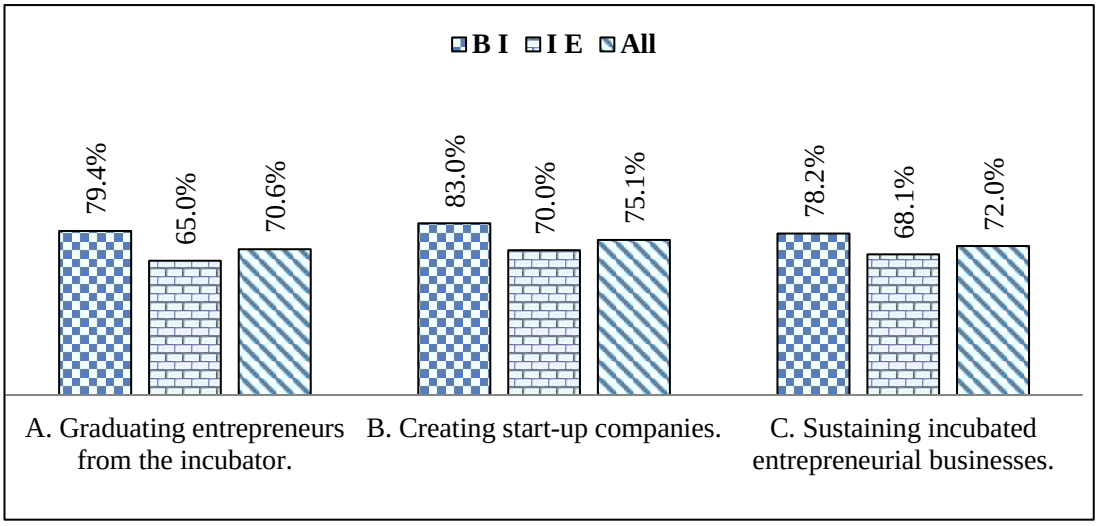

Figure 14: Success level of business incubators in the UAE

Finally, to understand the motive behind joining an incubator in the UAE, the survey targeting incubated entrepreneurs have asked the respondents to rate the three defined reasons for moving into business incubators. According to Table 44, the result showed that 42.3% and 30.8% of respondents either strongly agreed or agreed with the reason of "competitive market rate for workstations/ office space" respectively. When respondents have been asked to rate reason of "facilities, services, and networking", the responses of incubated entrepreneurs were almost similar; it was found that they either strongly agreed (46.2%) or agreed (30.8%) with that reason. With regards to the motive of having "fund sources" the respondents somehow agreed (32.7%) or agreed (23.1%) with that reason.

However, half of the respondents (51.9%) strongly agreed with the reason of "support in creating start-ups" to join the business incubator in the UAE. Therefore, when comparing the opinions for joining the business incubator in the UAE among the four reasons, Figure 15 shows that respondents of incubated entrepreneurs have selected "facilities, services, and networking" and "support in creating start-ups" as the highest reasons (82.3%) for joining an incubator, while "fund sources" were considered the lowest reason for joining the incubators in the UAE.

Table 44: Reasons to move into a business incubator in the UAE

F10. Reason to choose to move into a business incubator

	Source	Sample size	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree	Mean Value	Mean %	Mean S. D	Agreement level
A. Competitive market rate for workstations/ office space	I E	52	1 (1.9%)	6 (11.5%)	8 (15.4%)	15 (28.8%)	22 (42.3%)	3.98	(79.6%)	1.111	**Strongly**
B. Facilities, services, and networking	I E	52	1 (1.9%)	4 (7.7%)	7 (13.5%)	16 (30.8%)	24 (46.2%)	4.12	(82.3%)	1.041	**Strongly**
C. Fund sources	I E	52	4 (7.7%)	7 (13.5%)	12 (23.1%)	12 (23.1%)	17 (32.7%)	3.60	(71.9%)	1.287	**Strongly**
D. Support in creating start-ups	I E	52	2 (3.8%)	5 (9.6%)	5 (9.6%)	13 (25.0%)	27 (51.9%)	4.12	(82.3%)	1.166	**Strongly**

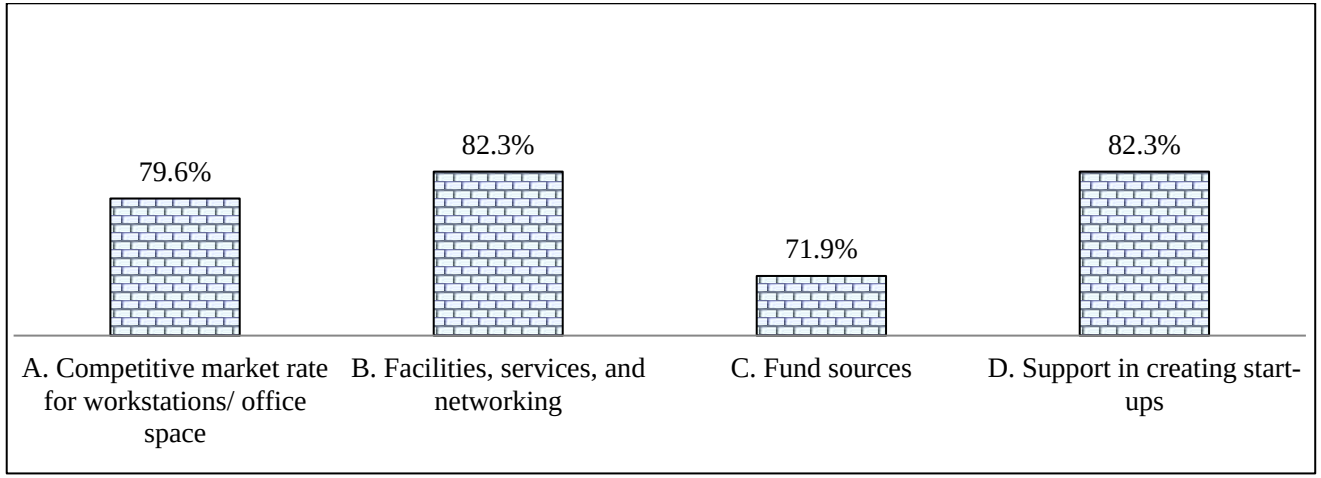

Figure 15: Reason to move into a business incubator in the UAE

5.4.2.7 Results of the Business Incubators' Roles in the UAE

The roles and impact of business incubators have always been under the scholars' attention particularly in their contribution to entrepreneurship practices (Elmansori, 2014; Khorsheed, Al-Fawzan, & Al-Hargan, 2014; Al Mubaraki & Busler, 2011). To assess the expected roles of current business incubators in the UAE, the questionnaire survey dedicated their last section for rating six types of expected contributions from business incubators in the UAE. Those expected roles are divided into the macro level (developing entrepreneurship culture, contributing to the local economy, and supporting national innovation strategy) and *micro* level (nurturing entrepreneurs, creating jobs, and commercialising new products and services).

When respondents from incubation management were asked to rate the importance of developing entrepreneurship culture, the result showed that more than half of the respondents (63.3%) have stated that its "extremely important", while almost half of the respondents (51.9%) from incubated entrepreneurs' category felt the same level of importance. With regards to the importance of contributing to the local economy, 54.5% of respondents from incubation management have stated that it is extremely important, comparing to 38.5% of respondents from incubated entrepreneurs who felt that it is extremely important. As far as business incubations' role in supporting national innovation strategy, 63.6% of survey participants from incubation management category have rated that it is extremely important comparing to 48.1% from incubated entrepreneurs' respondents. Thus, Table 45 summarises the importance level results at the *macro* level.

When analysing the importance of business incubators at the micro level, the results as shown in Table 46, the majority of responses from incubation management category

think that nurturing entrepreneurs through business incubators are extremely important (72.7%), while almost half of the responses (46.2%) from the incubated entrepreneurs felt that it is extremely important. With regards to the importance level of creating jobs by business incubators, the result showed that half of the responses from the incubation management category have stated that it is extremely important. However, the survey participants from incubated entrepreneurs' category did not agree that creating jobs through business incubators is extremely important; they indicated that it is either important (28.8%) or moderately important (23.1%). Finally, when the importance level of commercialising new products and services through business incubators were assessed by both categories of respondents, the result showed that 54.5% of incubation management respondents have stated that it is extremely important compared to 40.4% of incubated entrepreneurs' respondents.

Table 45: Key level of business incubators' roles in the UAE at the macro perspective

F11. Importance of business incubator in … (Macro Level)

	Sample	Not	Slightly	Moderately		Extremely	Mean			Importance	t-test results		
Source	size	important	important	important	Important	important	Value	%	S. D	level	t-value	df	Sig.
A. Developing entrepreneurship culture.													
B I	33	1 (3.0%)	0 (0.0%)	1 (3.0%)	10 (30.3%)	21 (63.6%)	4.52	(90.3%)	0.834	**Extremely**	1.813	83	.073
I E	52	3 (5.8%)	4 (7.7%)	6 (11.5%)	12 (23.1%)	27 (51.9%)	4.08	(81.5%)	1.218	**Extremely**			
All	85	4 (4.7%)	4 (4.7%)	7 (8.2%)	22 (25.9%)	48 (56.5%)	4.25	(84.9%)	1.101	**Extremely**			
B. Contributing to local economy.													
B I	33	1 (3.0%)	1 (3.0%)	5 (15.2%)	8 (24.2%)	18 (54.5%)	4.24	(84.8%)	1.032	**Extremely**	1.498	83	.138
I E	52	3 (5.8%)	4 (7.7%)	10 (19.2%)	15 (28.8%)	20 (38.5%)	3.87	(77.3%)	1.189	**Extremely**			
All	85	4 (4.7%)	5 (5.9%)	15 (17.6%)	23 (27.1%)	38 (44.7%)	4.01	(80.2%)	1.139	**Extremely**			
C. Supporting national innovation strategy in the UAE.													
B I	33	1 (3.0%)	1 (3.0%)	1 (3.0%)	9 (27.3%)	21 (63.6%)	4.45	(89.1%)	0.938	**Extremely**	1.808	83	.074
I E	52	2 (3.8%)	4 (7.7%)	10 (19.2%)	11 (21.2%)	25 (48.1%)	4.02	(80.4%)	1.163	**Extremely**			
All	85	3 (3.5%)	5 (5.9%)	11 (12.9%)	20 (23.5%)	46 (54.1%)	4.19	(83.8%)	1.096	**Extremely**			
F11. Overall importance of business incubator in … (Macro Level)													
B I	33						4.40	(88.0%)	0.857	**Extremely**	1.836	83	.070
I E	52						3.99	(79.8%)	1.110	**Extremely**			
All	85						4.15	(83.0%)	1.034	**Extremely**			

Table 46: Key level of business incubators' roles in the UAE at the micro perspective

F11. Importance of business incubator in … (Micro Level)														
		Sample	Not	Slightly	Moderately		Extremely	Mean			Importance	t-test results		
	Source	size	important	important	important	Important	important	Value	%	S. D	level	t-value	df	Sig.
D. In nurturing entrepreneurs.														
	B I	33	1 (3.0%)	0 (0.0%)	3 (9.1%)	5 (15.2%)	24 (72.7%)	4.55	(90.9%)	0.905	**Extremely**	2.476	83	.015*
	I E	52	3 (5.8%)	5 (9.6%)	9 (17.3%)	11 (21.2%)	24 (46.2%)	3.92	(78.5%)	1.250	**Extremely**			
	All	85	4 (4.7%)	5 (5.9%)	12 (14.1%)	16 (18.8%)	48 (56.5%)	4.16	(83.3%)	1.163	**Extremely**			
E. Creating jobs.														
	B I	33	1 (3.0%)	0 (0.0%)	9 (27.3%)	6 (18.2%)	17 (51.5%)	4.15	(83.0%)	1.034	**Extremely**	2.072	83	.041*
	I E	52	2 (3.8%)	8 (15.4%)	12 (23.1%)	15 (28.8%)	15 (28.8%)	3.63	(72.7%)	1.172	**Extremely**			
	All	85	3 (3.5%)	8 (9.4%)	21 (24.7%)	21 (24.7%)	32 (37.6%)	3.84	(76.7%)	1.143	**Extremely**			
F. Commercializing new products and services.														
	B I	33	1 (3.0%)	2 (6.1%)	5 (15.2%)	7 (21.2%)	18 (54.5%)	4.18	(83.6%)	1.103	**Extremely**	1.335	83	.185
	I E	52	3 (5.8%)	6 (11.5%)	9 (17.3%)	13 (25.0%)	21 (40.4%)	3.83	(76.5%)	1.248	**Extremely**			
	All	85	4 (4.7%)	8 (9.4%)	14 (16.5%)	20 (23.5%)	39 (45.9%)	3.96	(79.3%)	1.200	**Extremely**			
F11. Overall importance of business incubator in … (Micro Level)														
	B I	33						4.29	(85.8%)	0.900	**Extremely**	2.174	83	.033*
	I E	52						3.79	(75.8%)	1.103	**Extremely**			
	All	85						3.99	(79.8%)	1.052	**Extremely**			

* the value is significant at alpha ≤ 0.050

As a result, and according to Figures 16 and Figure 17, the results showing the respondents from incubation management category felt that all six expected roles from business incubators are important in general. However, the importance of creating jobs by business incubators was least significant (83.0%) comparing to the other five expected roles. This could be regarded as the difficulty of assigning this activity as a target by business incubation management. On the other hand, respondents from incubated entrepreneurs have rated almost the same level of importance for the six expected roles. They perceived the role of creating jobs by the business incubators as the least importance level (72.7%). Thus, they do not highly expect that business incubators are responsible for creating jobs in the UAE.

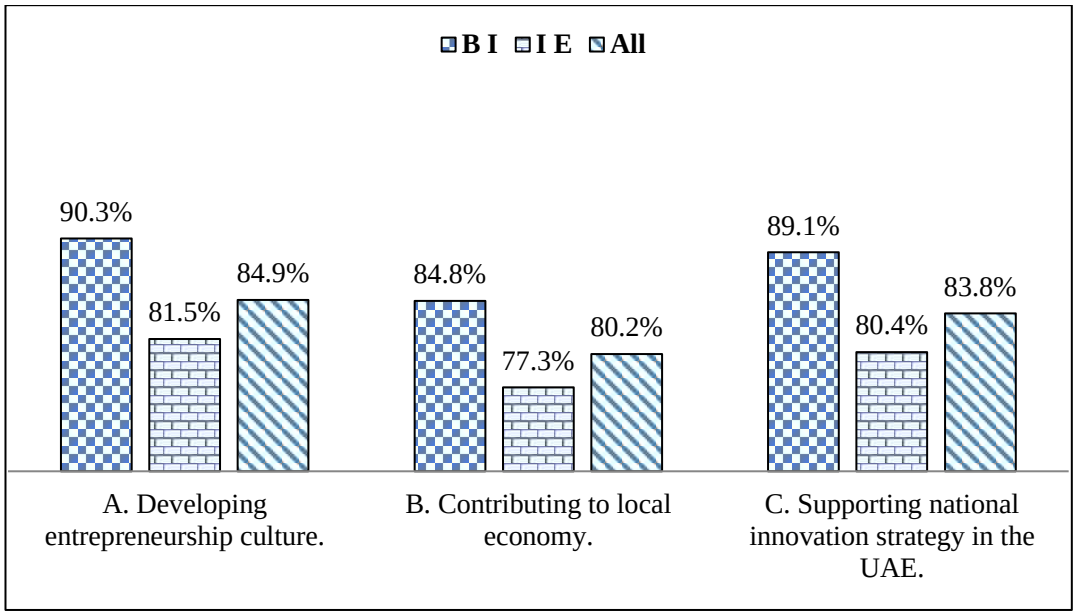

Figure 16: Key level of business incubators' roles in the UAE at the macro perspective

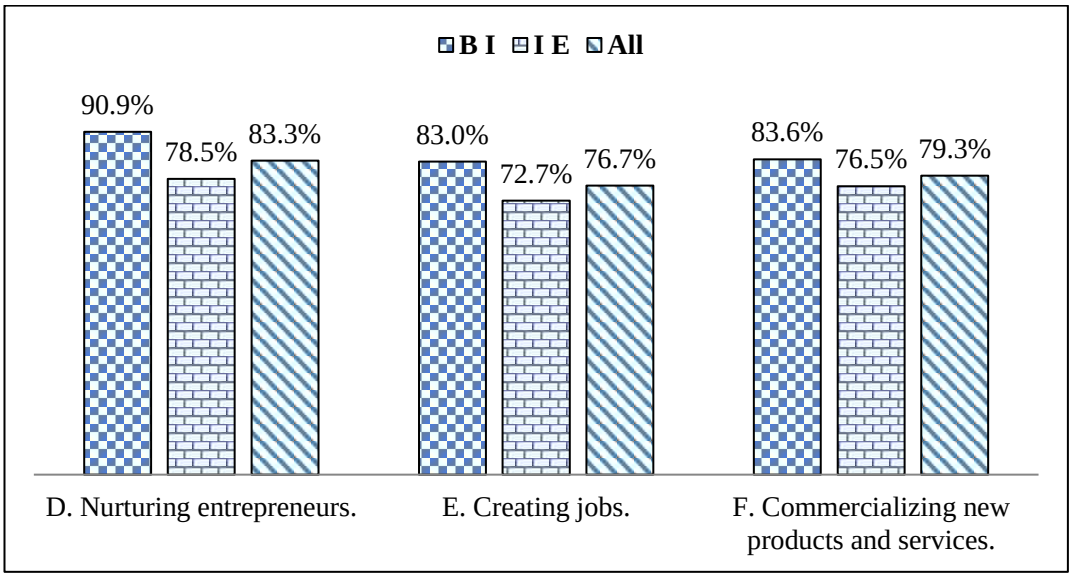

Figure 17: Key level of business incubators' roles in the UAE at the micro perspective

5.4.2.8 Results of Correlation Analysis

The correlation analysis is expected to identify the significant association between the different attributes of the internal and external factors with the three indicators of the success of the business incubators in the UAE. Having 5-point scale measures, the Bivariate Correlations procedure is conducted to compute Pearson's Correlation Coefficients with its significance level of p= 0.050.

In this study, the Pearson Correlation Coefficients (P) is conducted between the attributes of the factors of the same scale in order to identify how significantly these attributes are associated with each other. The findings of the results may enable the management of the incubators to understand the areas of significant associations between the internal and external factors with the success indices, and therefore, put more efforts on those areas to enhance their results (the three success indices), which may positively impact on their incubated entrepreneurs. As such, any positive changes in the results of these two separated scales (internal and external factors scales), will

positively affect the results of the success indices of a business incubator. In the following subsections, the different results of correlation analysis will be presented.

i] *Correlations between the attributes of the "Internal factors that contribute to the success of business incubator" scale*: Table 47 represents the results of the Pearson correlations between the attributes of the internal factors that contribute to the success of the business incubator scale. The results have shown positive and significant correlations between most of them at the level of p = 0.01, 2-tailed. However, based on the cut score of correlation value (more than or equal to r = 0.500), it was found that most of the attributes are significantly correlated to each other except one, which found to be less correlated (less than r = 0.500) with the remaining attributes (B. Our business incubator has contracts for their incubatees). Also, the attributes of the same factor were positively and significantly correlated (minimum value r = 0.269**, and maximum value r = 0.950**).

Table 47 have also shows many positive and significant correlations between the attributes of the different internal factors, which found to be higher than the cut score (more than or equal to r = 0.500), while the remaining attributes were found to be positively correlated but lower than the designated cut score (less than r =0.500), despite some of them are significant at p = 0.050, 2-tailed or p = 0.010, 2-tailed.

Table 47: *P* between internal factor attributes related to business incubator scale success

Internal Factors contribute to the success of Business Incubator		F1. Level of availability of these factors in business incubator		F2. Business incubators level of accessibility to …				F3. Level of qualification and experience of Business Incubators' management and technical team				F4. Level of capability of business incubator in …		
		A. Our business incubator has entry and exit criteria.	B. Our business incubator has contracts for their incubatees.	A. Information sources.	B. Expertise in targeted fields.	C. Fund sources.	D. Targeted customers.	A. The qualification of management team.	B. The Experience of management team.	A. The qualification of technical team.	B. The experience of technical team.	A. Generating and assessing entrepreneurial ideas.	B. Testing concepts and assessing feasibility of new products/ services.	C. Supporting intellectual property protection.
F1. Level of availability of these factors in business incubator														
A. Our business incubator has entry and exit criteria.	85													
B. Our business incubator has contracts for their incubatees.	85	.576**												
F2. Business incubators level of accessibility to …														
A. Information sources.	85	.631**	.405**											
B. Expertise in targeted fields.	85	.593**	.372**	.711**										
C. Fund sources.	85	.505**	.310**	.654**	.613**									
D. Targeted customers.	85	.509**	.387**	.527**	.699**	.565**								
F3. Level of qualification and experience Business Incubators' management and technical team														
A. The qualification of management team.	85	.552**	.304**	.621**	.563**	.414**	.511**							
B. The Experience of management team.	85	.527**	.269*	.574**	.563**	.439**	.471**	.932**						
C. The qualification of technical team.	85	.544**	.368**	.633**	.630**	.538**	.591**	.527**	.461**					
D. The experience of technical team.	85	.561**	.345**	.643**	.607**	.535**	.575**	.521**	.491**	.950**				
F4. Level of capability of business incubator in …														
A. Generating and assessing entrepreneurial ideas.	85	.623**	.462**	.673**	.721**	.577**	.614**	.589**	.580**	.680**	.695**			
B. Testing concepts and assessing the feasibility of new products/ services.	85	.565**	.397**	.654**	.725**	.567**	.654**	.522**	.479**	.722**	.708**	.841**		
C. Supporting intellectual property protection.	85	.369**	.210	.512**	.497**	.493**	.527**	.361**	.390**	.594**	.577**	.537**	.622**	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

ii] *Pearson Correlations between the attributes of the "External factors that contribute to the success of business incubator" scale*: Table 48 represents the results of the Pearson Correlations between the attributes of the external factors that contribute to the success of the business incubator scale. The results have shown positive and significant correlations between most of them at the level of p = 0.05, 2-tailed. However, based on the cut score of correlation value (more than or equal to r = 0.500), it was found that most of the attributes are correlated significantly to each other except one (E. R&D fund at the universities), which found to be less correlated (less than r = 0.500) with the remaining attributes. Also, the attributes of the same factor were positively and significantly correlated (minimum value r = 0.214*, and maximum value r = 0.791**).

Table 48 shows several positive and significant correlations between the attributes of the different external factors, which found to be higher than the cut score (more than or equal to r = 0.500), while many correlated attributes were found to be positive but lower than the designated cut score (less than r =0.500), despite some of them are significant (p = 0.050, 2-tailed or p = 0.010, 2-tailed).

Table 48: *P* between external factor attributes related to business incubator scale success

ExternalFactors contribute to thuccess of Business Incubator		F5. Level of governmental support for business incubator with …				F6. Level of availability of financial resources for business incubator					F7. Level of collaboration of business incubator with…		F8. Opinion regarding the entrepreneurship culture in …			
		A. Policies.	B. Incentives.	C. IP protection services.	D. Access to fund.	A. Government fund.	B. Private sector funds/ sponsorship.	C. Venture capital funds.	D. Banks loans.	E. R&D funds at universities	A. Universities.	B. Respective industry developers.	A. Identifying novel ideas.	B. Risk taking.	C. Identifying future opportunities.	D. Willingness to be nurtured within business incubators.
F5. Level of governmental support for business incubator with …																
A. Policies.	85															
B. Incentives.	85	.762**														
C. IP protection services.	85	.742**	.791**													
D. Access to fund.	85	.625**	.754**	.589**												
F6. Level of availability of financial resources for business incubator																
A. Government fund.	85	.497**	.551**	.485**	.496**											
B. Private sector funds/ sponsorship.	85	.288**	.315**	.318**	.415**	.348**										
C. Venture capital funds.	85	.296**	.409**	.291**	.462**	.343**	.652**									
D. Banks loans.	85	.229*	.212	.299**	.210	.376**	.372**	.565**								
E. R&D funds at universities	85	.157	.210	.307**	.170	.320**	.200	.383**	.666**							
F7. Level of collaboration of business incubator with…																
A. Universities.	85	.448**	.526**	.444**	.591**	.532**	.348**	.400**	.226*	.296**						
B. Respective industry developers.	85	.460**	.421**	.419**	.602**	.345**	.490**	.566**	.314**	.207	.732**					
F8. Opinion regarding the entrepreneurship culture in …																
A. Identifying novel ideas.	85	.524**	.586**	.511**	.538**	.336**	.200	.498**	.214*	.249*	.424**	.375**				
B. Risk taking.	85	.516**	.541**	.480**	.528**	.306**	.216*	.447**	.300**	.329**	.362**	.397**	.653**			
C. Identifying future opportunities.	85	.429**	.509**	.472**	.486**	.242*	.210	.495**	.237*	.277*	.405**	.447**	.744**	.723**		
D. Willingness to be nurtured within business incubators.	85	.547**	.637**	.539**	.594**	.368**	.365**	.498**	.345**	.362**	.440**	.503**	.597**	.694**	.675**	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

iii] *Correlations between the "Internal Factors that contribute to the success of Incubator" scale and the "Success Indices of Business Incubator in the UAE*": Table 49 represents the results of the Pearson correlations between the attributes of "internal factors that contribute to the success of business incubator" scale and the "success indices of business incubators in the UAE". The results have shown that all the correlations were positively significant at the level of $p = 0.01$, 2-tailed. The correlation coefficients varied between $r = 0.299^{**}$, and $r = 0.684^{**}$. Also, based on the cut score of correlation value (more than or equal to $r = 0.500$), it was found that many of the attributes of the internal factors were positively and significantly correlated at $p = 0.010$, 2-tailed with the three success indices.

The results in Table 49 had found the following correlations on the internal attributes:

a) The following internal attributes found to have significant positive correlations ($r \geq 0.500$) with the three success indices of business incubators in the UAE:
    - Accessing information sources in the networking accessibility factor.
    - Accessing targeted customers in the networking accessibility factor.
    - Qualifications of the management team in the human resources factor.
    - Experiences of the management team in the human resources factor.
    - Qualifications of the technical team in the human resources factor.
    - Experiences of the technical team in the human resources factor.
    - Generating and assessing entrepreneurial ideas in the commercialisation conditions factor.
    - Testing concepts and assessing the feasibility of new products/services in the commercialisation conditions factor.

b) The following internal attributes found to have significant positive correlations ($r \geq 0.500$) with the two success indices, as i) graduating entrepreneurs from the incubator, and ii) creating start-up companies) of business incubators in the UAE:
    - Having entry and exit criteria in the availability of infrastructure factor,
    - Accessing to expertise in the targeted fields the networking accessibility factor.
c) One internal attribute (accessing funding sources in the networking accessibility factor) found to have a strong positive correlation ($r \geq 0.500$) with one success index of the business incubators (creating start-up companies).

Furthermore, in terms of the success indices of the business incubators, the results presented in Table 49 had found the following Pearson correlations (*P*) within thirteen internal attributes:

- Ten internal attributes found to have a significant positive correlation as contributors to the success index of "A. Graduating entrepreneurs from the incubator".
- Eleven internal attributes found to have a significant positive correlation as contributors to the success index of "B. Creating start-up companies".
- Eight internal attributes found to have a significant positive correlation as contributors to the success index of "C. Sustaining incubated entrepreneurial businesses".

Table 49: *P* between internal factors related to incubator scale success and incubator success indices in the UAE

Internal Factors contribute to the success of Business Incubator	**A. Graduating entrepreneurs from the incubator.**	**B. Creating start-up companies.**	**C. Sustaining incubated entrepreneurial businesses.**
F1. Level of availability of these factors in business incubator	**.462****	**.519****	**.433****
A. Our business incubator has entry and exit criteria.	.539**	.564**	.474**
B. Our business incubator has contracts for their incubatees.	.299**	.373**	.306**
F2. Business incubators level of accessibility to …	**.660****	**.712****	**.613****
A. Information sources.	.603**	.602**	.544**
B. Expertise in targeted fields.	.596**	.586**	.465**
C. Fund sources.	.430**	.552**	.463**
D. Targeted customers.	.623**	.684**	.615**
F3. Level of qualification and experience Business Incubators' management team	**.677****	**.670****	**.660****
A. The qualification of management team.	.585**	.535**	.574**
B. The Experience of management team.	.546**	.509**	.539**
C. The qualification of technical team.	.592**	.617**	.566**
D. The experience of technical team.	.597**	.633**	.584**
F4. Level of capability of business incubator in …	**.575****	**.638****	**.535****
A. Generating and assessing entrepreneurial ideas.	.586**	.646**	.507**
B. Testing concepts and assessing the feasibility of new products/ services.	.588**	.639**	.533**
C. Supporting intellectual property protection.	.365**	.421**	.384**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

As a result, the hypotheses concerning the relation between the internal factors that contribute to the success of business incubators were tested by employing the Pearson correlation coefficient as presented earlier in Tables 47 and Table 49. The results of testing the hypothesis of HI_{CF1} "*The higher availability level of incubators' infrastructure, the more business incubators will succeed*" were accepted as all correlations were positively significant at $p = 0.010$, 2-tailed. However, the hypothesis

of HI_{CF1} can be considered partially accepted as some of the correlation values did not reach the strength level, which was defined by the researcher (cut score of $r = 0.500$; either significant or not at $p = 0.050$, 2-tailed).

With regards to the hypothesis of HI_{CF2} (*The higher level of networking accessibility of the incubator, the more business incubators will succeed*"), the findings showed that the hypothesis is accepted as all the correlations were positively significant at $p = 0.010$, 2-tailed. However, the hypothesis of HI_{CF2} can be considered partially accepted as some of the correlation values did not reach the strength level. As far as the hypothesis of HI_{CF3} "*The higher level of qualifications and experiences of the management and the technical team at the incubators, the more business incubators will succeed*", the results showed that the hypothesis is totally accepted as all the correlation values have reached the strength level (cut score of $r = 0.500$; either significant or not at $p = 0.050$, 2-tailed).

Finally, the findings of testing the hypothesis of HI_{CF4} "*The higher level of commercialisation conditions of the incubators, the more business incubators will succeed*" have shown that all the correlations were positively significant at $p = 0.010$, 2-tailed. However, the hypothesis of HI_{CF4} can be considered partially accepted as some of the correlation values did not reach the strength level.

iv] *Correlations between the "External factors that contribute to the success of business incubator" scale and the "Success indices of a business incubator in the UAE*": Table 50 represents the results of the Pearson Correlations between the attributes of "external factors that contribute to the success of business incubator" scale and the "success indices of business incubators in the UAE".

The results have shown that all the correlations were positively significant at the level of $p = 0.01$, 2-tailed and $p = 0.05$, 2-tailed. The correlation coefficients varied between $r = 0.095$, and $r = 0.655$**. Also, based on the cut score of correlation value (more than or equal to $r = 0.500$), it was found that many of the attributes of the external factors were positively and significantly correlated at $p = 0.010$, 2-tailed with the three success indices.

The results in Table 50 had found the following correlations on the external attributes:

i] The following external attributes found to have significant positive correlations ($r \geq 0.500$) with the three success indices of business incubators in the UAE:

- "Access to funding" in the government support factor.
- "Collaboration with respective industry developers" in the market condition factor.
- "Identifying novel ideas", the entrepreneurship culture factor
- "Identifying future opportunities" in the entrepreneurship culture factor.

ii] The following external attributes found to have a significant positive correlation ($r \geq 0.500$) with the two success indices (creating start-up companies and sustaining incubated entrepreneurial businesses) of incubators in the UAE:

- "Policies" in the government support factor,
- "Incentives" in the government support factor,
- "Venture capital funds" in the financial resources factor,
- "Risk Taking" in the entrepreneurship culture factor,
- "Willingness to be incubated" in the entrepreneurship culture factor.

In terms of the success indices of the business incubators, the results presented in Table 50 had found the following correlations within the fifteen external attributes:

- Four external attributes found to have a significant positive correlation as contributors to the success indexes of “A. Graduating entrepreneurs from the incubator”.
- Nine external attributes found to have a significant positive correlation as contributors to the success indexes of “B. Creating start-up companies”.
- Nine external attributes found to have a significant positive correlation as contributors to the success indexes of “C. Sustaining incubated entrepreneurial businesses”.

As a result, the hypotheses concerning the relation between the external factors that contribute to the success of business incubators were tested by employing the Pearson correlation coefficient as presented in Table 48 and Table 50.

Table 50: *P* between external factors related to incubator scale success and business incubator success indices in the UAE

External Factors contribute to the success of Business Incubator	**A. Graduating entrepreneurs from the incubator.**	**B. Creating start-up companies.**	**C. Sustaining incubated entrepreneurial businesses**
F5. Level of governmental support for business incubator with …	**.555****	**.598****	**.601****
A. Policies.	.486**	.534**	.536**
B. Incentives.	.499**	.551**	.563**
C. IP protection services.	.460**	.474**	.489**
D. Access to fund.	.516**	.554**	.538**
F6. Level of availability of financial resources for business incubator	**.376****	**.421****	**.454****
A. Government fund.	.261*	.226*	.266*
B. Private sector funds/ sponsorship.	.424**	.479**	.445**
C. Venture capital funds.	.488**	.554**	.552**
D. Banks loans.	.108	.182	.225*
E. R&D funds at universities	.095	.106	.179
F7. Level of collaboration of business incubator with…	**.575****	**.584****	**.555****
A. Universities.	.492**	.486**	.471**
B. Respective industry developers.	.579**	.602**	.564**
F8. Opinion regarding the entrepreneurship culture in …	**.608****	**.654****	**.657****
A. Identifying novel ideas.	.581**	.542**	.600**
B. Risk taking.	.418**	.552**	.540**
C. Identifying future opportunities.	.641**	.655**	.612**
D. Willingness to be nurtured within business incubators.	.497**	.540**	.545**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The results of testing the hypothesis of HI_{CF5} "*The greater the level of government support, the more business incubators will succeed*" were accepted as all the correlations were positively significant at p= 0.010, 2-tailed. However, the hypothesis of HI_{CF5} could be considered partially accepted as some of the correlation values did not reach the strength level, which was defined by the researcher (cut score of r= 0.500; either significant or not at p=0.050, 2-tailed). With regards to the hypothesis of HI_{CF6} "*The higher availability of financial resources, the more business incubators will succeed*", the findings showed that the hypothesis is accepted as all the correlations were positively significant at *p* = 0.010, 2-tailed. However, the hypothesis of HI_{CF6} can

be considered partially accepted as some of the correlation values did not reach the strength level.

As the hypothesis of HI_{CF7} states "*The higher level of collaboration, the more business incubators will succeed*", the findings showed that the hypothesis is accepted as all the correlations were positively significant at $p = 0.010$, 2-tailed. However, the hypothesis of HI_{CF7} could be considered partially accepted as some of the correlation values did not reach the strength level. Finally, the results of testing the hypothesis of HI_{CF8} "*The greater level of entrepreneurship culture, the more business incubators will succeed*" have shown that all the correlations were positively significant at $p = 0.010$, 2-tailed. However, the hypothesis of HI_{CF8} can be considered partially accepted as some of the correlation values did not reach the strength level.

5.4.2.9 Results of Multiple Regression (MR) Analysis

Linear Regression (LR) estimates the coefficients of the linear equation, involving one or more independent variables that effectively predict the value of the dependent variable. By applying the linear regression analysis, the relationship between these variables can be organised within a framework. The LR model assumes that there is a linear, or "straight line," relationship between the dependent variable and each predictor. This relationship is described in this formula: $[yi = b_0 + b_1 x_{i1} + ... + b_p x_{ip} + e_i]$, *where*

- i is the value of the i^{th} case of the dependent scale variable
- p is the number of predictors
- j is the value of the j^{th} coefficient, j=0..., p
- ij is the value of the i^{th} case of the j^{th} predictor
- i is the error in the observed value for the i^{th} case

The LR is used to model the value of a dependent scale variable based on its linear relationship with one or more predictors. The model is linear because when increasing the value of the (j^{th}) predictor by one unit, it increases the value of the dependent variable by (bj) units, when noting that ($b0$) is the intercept, the model-predicted value of the dependent variable when the value of every predictor is equal to zero.

In addition, when testing the impact of the internal and external factors that contribute to the success indices of the incubators, the multiple regression model can be considered one of the best statistic tools that can give good indices of such investigation. In the present study, the survey questionnaire has two scales that are presented to the incubators' management and incubators' clients. Therefore, each internal and external factor has its level of strength, which may differ from one respondent to another.

Thus, each set of factors can be considered as an independent variable when assessing their effect based on respondents' perceptions of the success indices of the incubator. Moreover, the multiple regression technique produces multiple indicators (parameters) that help in judging the suitability of the relationship, the effect of each independent variable (factors) on the dependent variable (success indices), and the level of significance for these effects.

The regression analysis used the four internal as well as the four external factors that contribute to the success of business incubators as independent variables, while each of the three success indices has been considered individually as a dependent variable. In next subsections, the results of each multiple regression analysis are presented.

i] *Multiple Regression (MR) Results for Internal Factors with Success Index of "Graduating Entrepreneurs from the Incubator*": The first regression analysis used the success index of "Graduating entrepreneurs from the incubator" as a dependent variable, while the four internal factors that contribute to the success of incubators were considered as independent variables. Table 51 summarises the obtained results of this regression. The regression analysis was performed using the default model of SPSS with a significance level of 95%.

Table 51: MR for internal factors with the success index of graduating entrepreneurs from the incubator

Model: $\hat{Y}_{\text{Graduating entrepreneurs from the incubator}} = \alpha + \beta F_1 + \beta F_2 + \beta F_3 + \beta F_4$

	Model Coefficients					Collinearity	
Independent Variables	**B**	**S.E**	**Beta**	**t-value**	**Sig.**	**Tolerance**	**VIF**
(Constant)	085	.414		.206	.837		
F1. Availability level of infrastructure and services in the business incubator	.040	.105	.038	.382	.704	.609	1.643
F2. Availability level of networking	.428	.180	.350	2.378	.020*	.283	3.533
F3. Level of qualification and experience of management and technical team	.504	.159	.421	3.165	.002**	.348	2.874
F4. Commercialization level of the business incubator	-.055	.178	-.044	-.312	.756	.311	3.213

Model $R^2 = 0.508$

Model F-value = 20.681, (P = 0.000)

N (observations) = 85

Table 51 shows that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than eight). Also, the ANOVA test has reported a significant F statistic (P = 0.000), which indicates that using the success

framework is better than guessing the mean. As a whole, the regression analysis does a good job of modelling the success index of "Graduating entrepreneurs from the incubator". Moreover, more than half of the variation (Model $R2= 0.508$) in the success index of "Graduating entrepreneurs from the incubator" is explained by the model.

Furthermore, Table (51) also shows the significant statistical relationship ($p \leq 0.050$) between two of the four internal factors (Availability of networking; where $p = 0.020$, and the qualifications and the experience of human resources at the incubator; where $p = 0.002$) and the success index of “Graduating entrepreneurs from the incubator”. The remaining two internal factors (availability of infrastructure and commercialization conditions) are non-significant coefficients, which indicates that these variables do not contribute much to the success index of “Graduating entrepreneurs from the incubator”.

Finally, the tolerances show that 40% to 70% of the variance in a given predictor can be explained by the other predictors. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.013 – 0.053), which indicates that the predictors are highly intercorrelated, and that small changes in the data values may lead to large changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Graduating entrepreneurs from the incubator" and the four internal factors, which contributes to the success of incubators. This also means that the results have succeeded to answer the second research question of the study.

As a result, by employing the MR Model and testing the hypotheses related to the four internal factors, which contributes to the success of incubators from the dimension of “Graduating entrepreneurs from the incubator” as presented in Table 51, the results of

testing the hypothesis of HI_{R1} "*The internal factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator*" were partially accepted as two internal factors (availability of infrastructure and services as well as the commercialization level of the incubator) were not significant (p = 0.050, 2-tailed) in predicting the success of business incubators from "graduating entrepreneurs from the incubator" perspective.

ii] *Multiple Regression (MR) Results for Internal Factors with Success Index "Creating start-up companies"*: The first regression analysis used the success index of "Creating start-up companies" as a dependent variable, while the four internal factors that contribute to the success of business incubators were considered as independent variables. Table 52 presents the obtained results of this regression. The regression analysis was conducted using the default model of SPSS with a significance level of 95%.

Table 52: MR for internal factors with success index "Creating start-up companies"

Model: $\hat{Y}_{\text{Creating start-up companies}} = \alpha + \beta F_1 + \beta F_2 + \beta F_3 + \beta F_4$

Independent Variables	Model Coefficients			t-value	Sig.	Collinearity	
	B	S.E	Beta			Tolerance	VIF
(Constant)	363	.365		.996	.322		
F1. Availability level of infrastructure and services in a business incubator	.090	.092	.093	.975	.333	.609	1.643
F2. Availability level of networking	.455	.159	.403	2.865	.005**	.283	3.533
F3. Level of qualification and experience of management and technical team	.280	.140	.253	1.993	.050*	.348	2.874
F4. Commercialization level of business incubator	.088	.157	.075	.560	.577	.311	3.213

Model R^2 = 0.552; Model F-value = 24.688, (P = 0.000); N (observations) = 85

Table 52 shows that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than eight). Also, the ANOVA test has reported a significant F statistic (P = 0.000), which indicates that using the success framework is better than guessing the mean. As a whole, the regression analysis does a good job of modelling the success index of "Creating start-up companies". Moreover, more than half of the variation (Model $R2 = 0.555$) in the success index of "Creating start-up companies" is explained by the model.

Furthermore, Table 52 also shows the significant statistical relationship ($p \leq 0.050$) between two of the four internal factors (Availability of networking; where $p = 0.005$ and the qualifications and the experience of human resources at the incubator; where, P =0.050) and the success index of “Creating start-up companies”. The remaining two internal factors (availability of infrastructure and commercialisation conditions) are non-significant coefficients, which indicates that these variables do not contribute much to the success framework.

Finally, the tolerances show that 40% to 70% of the variance in a given predictor can be explained by the other predictors. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.013 – 0.053), which indicates that the predictors are highly intercorrelated, and that small changes in the data values may lead to large changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Creating start-up" and the four internal factors that contribute to the success of incubators. This also means that the results have succeeded to answer the 2nd research question stated in Chapter One.

As a result, by employing the MR Model and testing the hypotheses related to the four internal factors, which contributes to the success of the incubator from the dimension of “Creating start-up companies” as presented in Table 52, the results of testing the hypothesis of HI_{R2} (“The internal factors contribute positivity to the success of business incubators in terms of Creating start-up companies”) were partially accepted as two internal factors (availability of infrastructure as well as the commercialization capability) were not significant (p = 0.050, 2-tailed) in predicting the success of business incubators from “Creating start-up companies” perspective.

iii] *Multiple Regression (MR) Results for Internal Factors with Success Index* “*Sustaining incubated entrepreneurial businesses*”: The first regression analysis used the success index of “Sustaining incubated entrepreneurial businesses” as a dependent variable, while the four internal factors that contribute to the success of business incubators were considered as independent variables. Table 53 reports the obtained results of this regression. The regression analysis was performed using the default model of SPSS with a significance level of 95%.

The generated results show that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than eight). Also, the ANOVA test has reported a significant F statistic (p = 0.000), which indicates that using the success framework is better than guessing the mean. As a whole, the regression does a good job of modelling the success index of "Sustaining incubated entrepreneurial businesses". Moreover, almost half of the variation (Model $R2$ = 0.466) in the success index of "Sustaining incubated entrepreneurial businesses" is explained by the model.

Table 53: MR for internal factors with success index "Sustaining incubated entrepreneurial businesses"

Model: $\hat{Y}_{\text{Sustaining incubated entrepreneurial businesses}} = \alpha + \beta F_1 + \beta F_2 + \beta F_3 + \beta F_4$

	Model Coefficients					Collinearity	
Independent Variables	**B**	**S.E**	**Beta**	**t-value**	**Sig.**	**Tolerance**	**VIF**
(Constant)	446	.417		1.072	.287		
F1. Availability level of infrastructure and services	.031	.105	.031	.294	.770	.609	1.643
F2. Availability level of networking	.337	.181	.286	1.860	.066	.283	3.533
F3. Level of qualification and experience of management and technical team	.555	.160	.480	3.464	.001**	.348	2.874
F4. Commercialization level of business incubator	-.089	.179	-.073	-.496	.621	.311	3.213

Model $R^2 = 0.466$

Model F-value = 17.467, (P = 0.000)

N (observations) = 85

Furthermore, Table 53 also shows the significant statistical relationship ($P \leq 0.050$) between one of the four internal factors (the qualifications and the experiences of human resources at the incubator; where, $p = 0.013$) and the success index of "Sustaining incubated entrepreneurial businesses". The remaining three internal factors (availability of infrastructure, networking, and commercialisation conditions) are non-significant coefficients, which indicates that these variables do not contribute much to the success index of "Sustaining incubated entrepreneurial businesses".

Finally, the tolerances show that 40% to 70% of the variance in a given predictor can be explained by the other predictors. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.013 – 0.053), which indicates that the predictors are highly intercorrelated, and that

small changes in the data values might lead to significant changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Sustaining incubated entrepreneurial businesses" and the four internal factors, which contributes to the success of business incubators. This also means that the results have succeeded to answer the second question stated in Chapter One.

As a result, by employing the MR Model and testing the hypotheses related to the four internal factors, which contributes to the success of business incubators from the dimension of "Sustaining incubated entrepreneurial businesses" as presented in Table 53, the results of testing the hypothesis of HI_{R3} "*The internal factors contribute positivity to the success of business incubators in terms of sustaining start-ups in the market*" were partially accepted as three internal factor (availability of infrastructure services; availability of networking; and the commercialization level of the incubator) were not significant (p = 0.050, 2-tailed) in predicting the success of business incubators from "sustaining incubated entrepreneurial businesses" perspective.

iv] *Multiple Regression (MR) Results for External Factors with Success Index "Graduating Entrepreneurs from the Incubator"*: The second regression analysis used the success index of "Graduating entrepreneurs from the incubator" as a dependent variable, while the four external factors that contribute to the success of business incubators were considered as independent variables. Table 54 presents the obtained results of this regression. The regression analysis was conducted using the default model of SPSS with a significance level of 95%.

Table 54: MR for external factors with success index “Graduating entrepreneurs from the incubator.”

Model: $\hat{Y}_{\text{Graduating entrepreneurs from the incubator}} = \alpha + \beta F_5 + \beta F_6 + \beta F_7 + \beta F_8$

	Model Coefficients					Collinearity	
Independent Variables	**B**	**S.E**	**Beta**	**t-value**	**Sig.**	**Tolerance**	**VIF**
(Constant)	.604	.374		1.617	.110		
F5. Level of governmental support for the incubators	.139	.134	.126	1.035	.304	.442	2.262
F6. Availability level of financial resources for a business incubator	-.087	.127	-.070	-.680	.499	.618	1.619
F7. Collaboration level of the business incubator	.356	.113	.341	3.140	.002**	.559	1.788
F8. Entrepreneurship culture	.450	.137	.381	3.287	.002**	.492	2.034

Model $R^2 = 0.471$

Model F-value = 17.841, (P = 0.000)

N (observations) = 85

The results showed that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than eight). Also, the ANOVA test has reported a significant F statistic ($p = 0.000$), which indicates that using the success framework is better than guessing the mean. As a whole, the regression does a good job of modelling the success index of "Graduating entrepreneurs from the incubator". Moreover, almost half of the variation (Model $R2 = 0.471$) in the success index of "Graduating entrepreneurs from the incubator" is explained by the model.

Furthermore, Table 54 also shows the significant statistical relationship ($p \leq 0.050$) between two of the four external factors (Collaboration level of the incubator; where $p = 0.002$, and Entrepreneurship culture; where, $p = 0.002$) and the success index of “Graduating entrepreneurs from the incubator”. The remaining two external factors (Government Support and Financial Resources) are non-significant coefficients, which indicate that these variables do not contribute much to the success index of “Graduating entrepreneurs from the incubator”.

Finally, the tolerances show that the other predictors can explain 40% to 60% of the variance in a given predictor. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.030 – 0.066), which indicates that the predictors are highly intercorrelated, and that small changes in the data values may lead to substantial changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Graduating entrepreneurs from the incubator" and the four external factors, which contributes to the success of business incubators. This also means that the results have succeeded to answer the third research question stated in Chapter One.

As a result, by employing the MR Model and testing the hypotheses related to the four external factors, which contributes to the success of business incubators from the dimension of "Graduating entrepreneurs from the incubator" as presented in table (54), the results of testing the hypothesis of HI_{R4} "*The external factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator*" were partially accepted as two external factors (government support level for the incubators and the availability of financial resources for the incubators within the UAE domain) were not significant (p = 0.050, 2-tailed) in predicting the success of business incubators from "graduating entrepreneurs from incubator" perspective.

v] *Multiple Regression Results for External Factors with Success Index* "*Creating start-up companies*": The second regression analysis used the success index of "Creating start-up companies" as a dependent variable, while the four external factors that contribute to the success of business incubators were considered as independent variables. Table 55 reports the obtained results of this regression.

The regression analysis was performed using the default model of SPSS with a significance level of 95%.

Table 55: MR for external factors with success index “Creating start-up companies”

Model: $\hat{Y}_{\text{Creating start-up companies}} = \alpha + \beta F_5 + \beta F_6 + \beta F_7 + \beta F_8$

Independent Variables	Model Coefficients			t-value	Sig.	Collinearity	
	B	S.E	Beta			Tolerance	VIF
(Constant)	.876	.328		2.669	.009**		
F5. Level of governmental support for business incubator	.158	.118	.156	1.339	.184	.442	2.262
F6. Availability level of financial resources for the business incubator	-.035	.112	-.031	-.311	.757	.618	1.619
F7. Collaboration level of business incubator	.285	.100	.296	2.862	.005**	.559	1.788
F8. The entrepreneurship culture	.447	.120	.410	3.722	.000**	.492	2.034

Model $R^2 = 0.522$

Model F-value = 21.802, (P = 0.000)

N (observations) = 85

The results showed that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than eight). Also, the ANOVA test has reported a significant F statistic ($p = 0.000$), which indicates that using the success framework is better than guessing the mean. As a whole, the regression does a good job of modelling the success index of "Creating start-up companies". Moreover, more than half of the variation (Model $R2 = .522$) in the success index of "Creating start-up companies" is explained by the model.

Furthermore, Table 55 also shows the significant statistical relationship ($p \leq 0.050$) between two of the four external factors (Collaboration level of the incubator; where P = 0.005 and the Entrepreneurship Culture; where, $p = 0.000$) and the success index of “Creating start-up companies”. The remaining two external factors (Government Support and Financial Resources) are non-significant coefficients, which indicates that

these variables do not contribute much to the success index of “Creating start-up companies”.

Finally, the tolerances show that the other predictors can explain almost 40% to 60% of the variance in a given predictor. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.030 – 0.066), which indicates that the predictors are highly intercorrelated, and that small changes in the data values may lead to large changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Creating start-up companies” and the four external factors that contribute to the success of business incubators. This also means that the results have succeeded to answer the third research question stated in Chapter One.

By employing the MR Model and testing the hypotheses related to the four external factors, which contributes to the success of business incubators from the dimension of “Creating start-up companies” as presented in Table 55, the results of testing the hypothesis of HI_{R5} “*The external factors contribute positivity to the success of business incubators in terms of Creating start-up companies*” were partially accepted as two external factors (government support level for the incubators; and availability of financial resources for the incubators in the UAE domain) were not significant (p = 0.050, 2-tailed) in predicting the success of business incubators from “Creating start-up companies” perspective.

vi] *Multiple Regression Results for External Factors with Success Index* “*Sustaining incubated entrepreneurial businesses*”: The second regression analysis used the success index of “Sustaining incubated entrepreneurial businesses” as a dependent variable, while the four external factors that

contribute to the success of business incubators were considered as independent variables. Table 56 presents the obtained results of this regression. Regression analysis was performed using the default model of SPSS with a significance level of 95%.

Table 56: MR for internal factors with success index "Sustaining incubated entrepreneurial businesses"

Model: $\hat{Y}_{\text{Sustaining incubated entrepreneurial businesses}} = \alpha + \beta F_5 + \beta F_6 + \beta F_7 + \beta F_8$

	Model Coefficients					Collinearity	
Independent Variables	**B**	**S.E**	**Beta**	**t-value**	**Sig.**	**Tolerance**	**VIF**
(Constant)	.588	.347		1.693	.094		
F5. Level of governmental support for business incubator	.181	.125	.171	1.456	.149	.442	2.262
F6. Availability level of financial resources for a business incubator	.044	.118	.037	.371	.712	.618	1.619
F7. Collaboration level of business incubator	.225	.105	.223	2.134	.036*	.559	1.788
F8. The entrepreneurship culture	.463	.127	.406	3.635	.000**	.492	2.034

Model $R^2 = 0.510$

Model F-value = 20.830, (P = 0.000)

N (observations) = 85

Table 56 showed that there was no issue of multicollinearity as the indices of the Variable Inflation Factor (VIF) were low (less than 8). Also, the ANOVA test has reported a significant F statistic (p = 0.000), which indicates that using the model is better than guessing the mean. As a whole, the regression does a good job of modelling the success index of "Sustaining incubated entrepreneurial businesses". Moreover, more than half of the variation (Model $R2$ = 0.510) in the success index of "Sustaining incubated entrepreneurial businesses" is explained by the model.

The Table also shows significant statistical relationship ($p \leq 0.050$) between two out of four external factors (collaboration level of the incubator; where P = 0.036 and the entrepreneurship culture; where, $p = 0.000$) and the success index of "sustaining incubated entrepreneurial businesses". The external factors (i.e., government support and financial resources) are non-significant coefficients to contribute much to the success index of "sustaining incubated entrepreneurial businesses".

Finally, the tolerances show that 40% to 60% of the variance in a given predictor can be explained by the other predictors. The collinearity diagnostics of the model confirm that there are problems with multicollinearity as all the eight values are close to 0.0 (0.030 – 0.066), which indicate that the predictors are highly intercorrelated, and that small changes in the data values may lead to large changes in the estimates of the coefficients. This indicates that there is a relationship between the success index of "Sustaining incubated entrepreneurial businesses" and the four external factors, which contribute to the success of business incubators. This also means that the results have succeeded to answer the third research question of this study.

As a result, by employing the MR Model and testing the hypotheses related to the four external factors, which contributes to the success of business incubators from the dimension of "Sustaining incubated entrepreneurial businesses" as presented in Table 56, the results of testing the hypothesis of HI_{R6} "*The external factors contribute positivity to the success of business incubators in terms of Sustaining incubated entrepreneurial businesses*" were partially accepted as two external factors (government support level for the incubators and the availability of financial resources for the incubators within the UAE domain) were not significant ($p = 0.050$, 2-tailed)

in predicting the success of business incubators from “Sustaining incubated entrepreneurial businesses” perspective.

5.5 Conclusion

This chapter discussed the collection of the required data (quantitative and qualitative) needed for this study, presented the results for each set of data collected, and conducted a descriptive, factor, reliability, correlation, and multiple regression analysis of the primary data from three sources as followings:

i] Experts are coming from five categories of business incubations’ stakeholders in the UAE through semi-structured interviews.

ii] Management of incubators in the UAE through a structured survey questionnaire.

iii] Incubated entrepreneurs at active business incubators in the UAE through a structured survey questionnaire.

With regards to the primary data collected from the interviews with stakeholders of incubators in the UAE, a thematic analysis and content analysis was applied as an approach for organising and interpreting the data. As a result, the interviewees identified several success indicators, factors that may influence the success of the incubation, and suggested specific roles that are expected from the incubators in the UAE. The result of the analysis is summarised as followings:

i] Interviewees believed that incubators are successful when their incubated clients can sustain their businesses in the open market, their clients can create start-ups, manage to graduate entrepreneurs successfully from the incubators, and the incubated clients can create jobs.

ii] Financial resources and government support factors were considered the most critical external factors that may influence the success of incubators in the UAE.

iii] Nurturing entrepreneurs and contributing to the local economy are the highest two roles expected from business incubators in the UAE.

Regarding the primary data collected from management of the incubators and the incubated entrepreneurs through structured survey, the results of descriptive analysis summarized the perceptions of survey respondents on how to measure the success of business incubators, the external and internal factors affecting their success, and the expected roles from the incubators in the UAE. The results showed that there are eleven business incubators are currently operating in the UAE and distributed in different Emirates. The majority of the incubators are government owned covering almost all the economic sectors that are targeted by the UAE government and providing a different set of services. Also, the results showed that the incubators could graduate entrepreneurs and create start-ups, while the majority of their clients are undergraduate and graduate students.

Moreover, a factor analysis was conducted in order to extract the constructs that efficiently describe the investigated variables (factors). As result, two items from external factor (market conditions that determine the collaboration level of the incubator) and two items from internal factors (availability of infrastructure and commercialization capabilities of the incubators) has been deleted. The reliability analysis was also conducted, and the results showed that each set of items that represent each factor were consistent with each other and the measurement scale is reliable.

Furthermore, a correlation analysis was conducted to identify the relationship between different factors and the indicators of incubators' success, the results showed that eight internal attributes have significant positive correlations with the three success indices of the incubators, two internal attributes have significant positive correlations with two success indices, and one internal attribute have significant positive correlations with one success index. As far as the external attributes, the result found four external attributes that have significant positive correlations with the three success indices of the incubators and five external attributes have significant positive correlations with two success indices of the incubators.

Finally, a multiple regression analysis was conducted to predict the items within the external and internal factors that contribute to the success of the incubators. The results showed that the factors of networking availability and the qualifications and experiences of human resources at the incubators are contributing to the success of "graduating entrepreneurs from the incubator" as well as to success of "creating start-up companies", while the factor of the qualifications and experiences of the human resources is contributing to the success of the incubator in terms of "sustaining incubated entrepreneurial businesses". As far as the external factors that contribute to the success of the incubators, the results showed that the factors of collaboration level of the incubator and the entrepreneurship culture are contributing to the success of graduating entrepreneurs from the incubator, creating start-up companies, and sustaining incubated entrepreneurial businesses.

As a result, the findings have enabled validating the research hypotheses related to the correlations between internal and external factors and the success indices of business incubators as well as the hypotheses related to predict internal and external factors that

contribute to the success of business incubators. As such, the findings revealed that the seven correlation hypotheses had been partially accepted, while the hypothesis of HI_{CF3} "*The higher level of qualifications and experiences of the management and the technical team at the incubators, the more business incubators will succeed*" have been accepted. As far as the predictors' hypotheses, the findings revealed that all the eight hypotheses (four internal and for external factors) had been partially accepted. Thus, results have succeeded in answering the second research question (*What are the critical internal factors that may impact the success of business incubators in the UAE*?) and the third research question (*What are the critical external factors that may impact the success of business incubators in the UAE*?) in this study.

Chapter 6: Discussion of Analysis

6.1 Introduction

Building on the data collection and analysis chapter, the discussion chapter is concerned with answering the research questions and therefore, aiming to achieve the research objectives. The nature of the research questions revolves around the success of business incubation in the UAE in two dimensions; the input for success (the enabling factors) and the output of success (the roles of incubators in the UAE). Through the lens of incubators' stakeholders and supported by respective studies, the outcomes of this results could help to respond to proposed hypotheses and enable to update the conceptual framework of incubations' success in the UAE domain and propose recommendations of the study.

Thus, to simplify the discussion of the results, this Chapter is divided into seven sections:

i] Section 6.2 discusses the internal enabling factors of incubators to address how infrastructure, networking, human resources, and commercialisation capability factors are likely going to affect the success of business incubators in the UAE.

ii] Section 6.3 discusses the external enabling factors of incubation, which addresses how government support, financial resources, market condition, and entrepreneurship culture factors are likely going to affect the success of business incubators in the UAE.

iii] Section 6.4 discusses the perception of incubations' success. In particular, it examines how the business incubators should measure their success based on the views of their stakeholders in the UAE.

iv] Section 6.5 discusses the expected roles of business incubators in the UAE. The discussion covers the roles at the micro and macro level that are directly related to the entrepreneurship practices.

v] Section 6.6 discusses the results of correlation analysis, which addresses all the correlations between the attributes of internal and external factors of business incubators with the indicators of incubator's success. Also, the section discusses the results of testing the correlation hypotheses.

vi] Section 6.7 discusses the results of the regression analysis, which addresses the contributions of internal and external factors of business incubators on the success indices of incubators in the UAE. Also, this Section discusses the results of testing regression hypotheses.

The above discussion summarises the findings and; therefore, enable to propose a sound conceptual framework for business incubations' success in the UAE.

6.2 Discussion of Internal Factors of Business Incubation in the UAE

The third research objective in this study seeks to describe how the internal factors, concerning infrastructure, networking, human resources, and commercialisation conditions are expected to affect the success of incubators in the UAE. When looking into the results of the interviews (see Table 21), the generated findings showed that the interviewees had the highest concerns on networking and commercialisation factors; particularly among the internal ones.

In the survey results, the analysis has shown that the UAE incubators have a good infrastructure, particularly in terms of facilities, administration services (see Table 26), availability of entry and exit criteria, and availability of contracts for incubated

entrepreneurs (see Table 35). In terms of the networking accessibility of the incubators in the UAE, the findings showed that the incubators can access information sources, expertise and customers more than accessing to fund sources (see Table 36). With regards to the qualification and experience level of human resources at the incubators in the UAE, the results revealed that the management team of incubators are more qualified and experienced compared to the qualifications and experience of technical team (see Table 37).

Finally, in terms of the commercialization conditions of the incubators, the survey results showed that the incubators are capable of conducting programs that generate and assess entrepreneurial ideas as well as assessing the feasibility of new products and services, while they are less capable of providing intellectual property protection services for their incubated entrepreneurs (see Table 38). In the following sections, the four internal factors will be further discussed in order to answer the second research question by discussing the impact of their influence on the incubations' success in the UAE. Also, the findings are compared with the results of international and GCC studies in the business incubation field.

6.2.1 The infrastructure of the Incubator

The interview analysis has revealed that "having useful facilities and management services", were considered as one of the most enabling factors for incubators to succeed, while none of the interviewees has considered "having contracts" or a "progress criterion" as enablers for incubations' success. Also, only two interviewees have stated the importance of "having entry and exit criteria" as an enabler for incubators to succeed in the UAE. As far as the survey results, the analysis has shown that incubators provide a variety of facilities and management services. However, the

incubated entrepreneurs felt that the entry and exit criteria, as well as clients' contracts, are currently not highly available at the incubators in the UAE.

Thus, when relating the results of the interviews with the survey, the analysis shows that the facilities and management services at the incubators are considered as a fundamental requirement needed by the incubated entrepreneurs, which has been provided by the current incubators in the UAE. On the other hand, although the element of entry and exit criteria and the contracts of incubated entrepreneurs were available at the incubators in the UAE, the interviewees felt that those elements are not real enablers for incubators to succeed.

Also, within the university-based incubators, several support services have been offered to incubated entrepreneurs such as networking events and mentorships. However, due to the early nature of those incubators, the outcomes of incubated start-ups are expected to emerge after some time, while building a skilled workforce with entrepreneurial mindsets.

6.2.1.1 Facilities and Management Services

The findings in the present study have shown the importance of having facilities and offering management services that are tailored to clients' requirements. This can mainly attribute to the cost of those facilities and services, which cannot be afforded by the individual entrepreneurs to develop their entrepreneurial ventures. Also, these offerings at the incubators have a direct influence on reducing the operating expenses of the entrepreneurial ventures, which enable the incubated entrepreneurs to efficiently utilise their early stage fund on their products and services. This approach may

accelerate the process of developing their businesses, and therefore, create their start-ups once the feasibility of the products or services is realised.

Several international studies discussed the importance of having services and facilities at the business incubators that are offered for their tenants. Those studies were aligned with our study findings. Kamdar (2012) for instance, indicated that new start-ups could not afford to rent high-cost facilities or unique services, which can be found at incubators that gives them a competitive advantage. The analysis of his study revealed that the incubators in India are encouraging entrepreneurship significantly through physical facilities, management services, and conducive business environment. Thus, Kamdar (2012), agreed with the necessity of having comprehensive value-added services as well as facilities to meet the requirements of their clients due to its significant impact on the success of their incubated start-ups.

In addition, Hackett and Dilts (2004b) have also agreed with the need for management services, particularly in providing soft services such as preparing business plans, mentoring, and fundraising. The researcher claimed that these services are offered to overcome the challenges faced by incubated entrepreneurs while developing their businesses. Moreover, based on their study findings, Obeidat and Abu-Shanab (2010) indicated that Jordan innovation centres justified the high demand of entrepreneurs due to physical and subsidised services offered by the centres. The researcher showed that the availability of those facilities and technical services has impacted positively on clients' satisfaction level, and therefore, their choice of joining.

With regards to the GCC studies in incubation field, Elmansori (2014) agreed with our study findings when conducted a comparison study between Jordan and the UAE about incubation practices. The researcher found that the essential services are management

consultations, provide workspaces, and sharing knowledge and experiences. However, the researcher indicated that each incubator has its approach to offer these services based on their objectives. Elmansori believed that exposing the incubated entrepreneurs with these value-added services may increase the chances of their success, which eventually will be considered a success for the incubator. Finally, when comparing the findings of Elmansori (2014) study in terms of the services provided at the incubators in Jordan and UAE, it was noticed that they are almost aligned with our study findings as declared by the incubation management and incubated entrepreneurs at the incubators in the UAE (see Table 26).

6.2.1.2 Entry and Exit Criteria

The present study has shown that the majority of interviewees have not seen an entry and exit criteria as an essential enabler for incubations' success, while the survey results in the present study have shown that the current business incubators in the UAE are applying those criteria. Nevertheless, those findings can be justified as the governance practices on business incubators is considered relatively new in the UAE. In addition, due to high investment of establishing and operating incubators, it is logic to assume that applying such criteria may enhance the overall efficiency of the incubators through rigorous filtration process, and therefore, incubating only potential entrepreneurs from input perspective (entry criteria), and accelerating the graduation of entrepreneurs from output perspective (exit criteria), which will eventually optimize the incubators' resources.

Some international studies found to be discussing the importance of having entry and exit criteria for their clients. Sithole and Rugimbana (2014) referred to the soft services as part of incubators’ experiences that are offered to incubated entrepreneurs such as

entry and exit criteria, and clients' contracts. In this regard, although the researchers did not decide on specific entry and exit criteria due to different types of incubators, however, Sithole and Rugimbana (2014) believed that the incubators who have clear entry and exit criteria might increase the success chance of incubated businesses. Verma (2005) and Smilor (1987) agreed with this opinion, the researchers recommended having such criteria as it will optimise the incubation cycle, and in the same time, increases the chances of creating start-ups, which enables the incubators to achieve their mandate efficiently.

With regards to the incubation studies within the GCC region, Alsheikh (2009) summarised a set of entry criteria, which was developed by different related researchers to be applied by incubators when evaluating potential entrepreneurial ventures. Thus, the researcher agreed with the importance of having such criteria. In this regard, Alsheikh (2009) advocated that the movement from providing physical infrastructure to soft facilities by new incubators have helped in increasing the feasibility of incubated businesses than before.

6.2.1.3 Clients' Contract

Though the survey results of this study have revealed that none of the interviewees has indicated the importance of having contracts for incubated clients, the feedback of the survey respondents has shown that the current incubators have contracts for their incubators. Also, the current policies that protect the rights of both entrepreneurs and incubators are going under reviews due to limited cases of successful start-ups that graduated from public incubators in the UAE domain. Once several cases of incubated start-ups appeared to be lucrative or at least have a potential in the market, the management of different types of incubators, as well as the regulators, are expected to

consider enhancing the respective policies. At that stage, the terms of incubated contracts, particularly the rights of the incubator may have a major impact on the probability of the incubators, and thus on their success. As such, it is important to consider the contract of incubated entrepreneurs as one of the enablers for incubators' success in the UAE.

Few international studies discussed the importance of having contracts for incubators' clients. Smilor (1987) agreed with having contracts with incubated entrepreneurs as it governs the relationship as well as expectations between both sides. In addition, Sithole and Rugimbana (2014) agreed with the existence of such a contract, particularly for university-based incubators due to different expectations from universities, faculty members, and students as the management of universities are keen to optimize its resources, while the incubated clients from other side are expected to maximize the use of resources offered to them at the incubators.

6.2.2 Networking of the Incubator

The analysis of interviews has shown that the networking factor was one of the most two identified enablers for incubations' success, particularly the accessibility of incubators to funding sources. On another hand, when the survey results were analysed, it was found that the incubators in the UAE have high accessibility level to information sources and expertise, while they are less accessible to fund sources and targeted customers. Therefore, based on the analysis of the interviews and survey questionnaire on networking factor, it can be concluded that their outcomes are almost aligned.

Besides that, the interview and questionnaire analysis show that incubators are effective when they have structured relationships with major stakeholders, which enables the incubated entrepreneurs to gain knowledge, access to resources, and build teams. Therefore, incubators such as in5 and INTELAQ have facilitated the accessibility to large corporations such as GE and Microsoft and exposed them to the ideas of entrepreneurs in a comfortable environment.

6.2.2.1 Information Sources

The interviewees of the present study have recognised the importance of accessing information for incubated entrepreneurs. Thus, they considered it part of the required tools to progress their entrepreneurial businesses. This finding can be justified as information sources can lead to leverage other dimensions of networking such as information to fund sources, expertise, and customer needs. Thus, the incubators can be considered valid if they managed to access the desired information, which is needed by their incubated clients. This entails having individuals at incubators that are well connected with industry related professionals, their respective suppliers, and potential customers.

Scholars around the world researched the networking factor as one of the critical factors for incubators to succeed. Kamdar (2012) found that incubation centres in India have realised the effectiveness of sharing information with other local incubators. Therefore, the researcher agreed with our study findings in the form of utilising such information for gaining technical knowledge, networking for fundraising, and approaching targeted customers. As far as incubation studies in GCC, Alsheikh (2009) agreed with our study findings in the importance of all kinds of networking, which will

differentiate the incubators from the business of co-working spaces, and ultimately enhance the success of incubated businesses.

6.2.2.2 Expertise Sources

The findings of this study have shown the importance of networking with a group of experts in order to enable incubated clients to progress in their businesses. Also, when reviewing the programs of incubators in the UAE, it was noticed that the majority of incubators had put extensive efforts in conducting continuous networking events, aiming to build a community of expertise around them that can be available whenever needed for incubated clients. This approach has helped the incubators to compensate the shortage of resident technical expertise from one side and outsourcing them for cost efficiency reason from another side.

Accessing expertise was recognised as one of the networking activities in several incubation studies. Sun, Ni, and Leung (2007) agreed with the importance of finding the right expertise to assist their incubated clients. The researcher considered that the benefit of networking with expertise might not only support the incubated start-ups but also advise the incubators themselves to consider targeted clients. Mian (1996) agreed with this view; the researcher highlighted the influence of accessing expertise at university-based incubators as one of the critical enablers, which will enhance the capabilities of joint-venture research projects.

Concerning business incubation studies within the GCC region, the findings of Alsheikh (2009) were aligned with interview results at the present study. Based on his study results in Saudi Arabia, the researcher found that the incubators are expected to

succeed if they were able to attract technical expertise for helping incubated entrepreneurs in their businesses.

6.2.2.3 Fund Sources

The results of the interviews have shown that more than half of the interviewees have considered networking with fund sources as a critical enabler for incubations' success in the UAE. This finding is aligned with the limited fund sources in the UAE for incubated entrepreneurs as declared by the same group of interviewees when evaluating the level of fund options for incubated entrepreneurs. Also, this finding is justified as the majority of incubators in the UAE are either owned by the government or resides under the university campus. In the case of government incubators, and based on the review of their fund sources, it was noticed that they mainly depend on government fund, while in the case of university-based incubators, they are considered as one of the departments of the university, which allocated some funds for them to spend. In both cases, it was noticed that the management did not put efforts to seek alternative external sources of funds. As a result, the incubated entrepreneurs who participated in the survey, have advocated for diversifying the fund sources for incubated businesses.

Some business incubation studies have considered accessing to fund sources as one of the networking activities, which will enable their incubated clients to raise fund for their projects. Sun, Ni, and Leung (2007) claimed that the networking capability of an incubator might facilitate other influential enabling factors such as accessing funding sources. In this regard, NBIA, (2007) supported this view as it reinforces the professional relationship with investors. In the GCC region, Alsheikh (2009) agreed

with this view as it increases the sources of fund for incubated start-ups in order to select the best option based on available conditions.

6.2.2.4 Targeted Customers

The results of the interviews have shown that more than 30% of the interviewees have indicated networking with targeted customers as one of the enablers for incubators to succeed. So, the survey results have shown that the incubators need to improve their networking with targeted customers, particularly from the incubated entrepreneurs' category. This finding could be attributed to limited knowledge exposure of incubation management on the potential customers for their incubated start-ups. Also, these findings reflect the networking capabilities with regards to reaching out with customers that could be interested in considering certain products and services offered by the incubated start-ups. This situation is quite critical as a lot of efforts and investment has been allocated by the incubators and their incubated start-ups in order to be considered by respective customers. Thus, it is ideal for strengthening the networking between the incubators and their potential customers in order to increase the chance of success for incubated businesses.

Business incubation studies have also considered the networking activity of incubators that facilitates the accessibility to targeted clients. Smilor (1987) agreed with our interview findings in terms of the importance of reaching targeted customers. The researcher believed that potential entrepreneurs would consider incubators that have connections with public and private entities as one of the main criteria for selecting the incubator. In this regard, Byat and Sultan (2014), have suggested that government incubators in the UAE can become an effective networking enabler for incubated

entrepreneurs due to its professional relationship with government and private entities, as well as universities.

6.2.3 Human Resources of the Incubator

The analysis of interviews has revealed that the interviewees have highly considered the technical experiences existed at the incubators as an enabling factor for incubators to succeed, followed by the experiences of the management team, while the qualifications of management and technical teams were not highly considered by the interviewees as an essential enabler for the success of the incubators. With regards to the survey results of present study, the findings revealed that the overall qualification levels of management and technical teams, as well as the experience of the management team, were very high at the incubators in the UAE. However, the overall responses from incubated entrepreneurs' category felt that the experiences of the technical team are not very high at the current incubators in the UAE. Therefore, based on the analysis of both interviews and survey results, the finding showed that higher technical experiences are needed at the incubators.

6.2.3.1 Qualification and Experience of Management Team

The analysis of interviews has considered the qualifications and experiences of the management team as one of the enablers for incubations' success in the UAE. These views were reflected in reality and appeared to be very high when it was investigated at existed business incubators in the UAE through the lens of incubated entrepreneurs as well as the incubation management team. This finding could be justified, especially when the respondents from incubated entrepreneurs' category have participated in the study survey; their perception indicates that the management team were able to handle the operation of the incubation cycle effectively, and in the same time, were able to

meet the demanding expectations from their incubated clients, which entails having competent team that is equipped with high qualifications and experiences.

Several international studies discussed the critical roles of human resources at the incubators. Kamdar (2012) agreed that the incubation centres profoundly rely on managers that can deliver quality services for their incubated entrepreneurs. These critical roles may include internal administration responsibilities as well as managing incubated clients. As such, Kamdar (2012) recommended having an experienced staff that can support creating successful start-ups. Smilor (1987) agreed with this view, particularly in networking experiences of the management team, in which they can facilitate the business of incubated entrepreneurs such as attracting fund and accessing to respective customers.

As far as the GCC related studies are concerned, Elmansori (2014) claimed that the managers of incubators need to be involved in all stages of the incubation cycle. Therefore, the researcher agreed with the critical role of incubators' managers due to their responsibility for optimising the resources. In the same time, they may facilitate signing deals for their clients, which obviously will impact on the success of the incubators.

6.2.3.2 Qualification and Experience of Technical Team

Some of the interviewees at present research have recognised the value of the technical team and its impact on the success of incubators, while the survey results have shown the need for the experienced technical team at current incubators in the UAE. This finding is justified as the majority of incubators are owned by public entities, which usually hires candidates with public sector experiences. This kind of candidates does

not fit the unique nature of incubators, which requires having candidates that went through the incubation cycle or at least practised entrepreneurship through creating a start-up company.

Also, finding such technical competencies becomes even harder with the case of university-based incubators due to the complexity of recruitment process from one dimension, and the challenges of assigning dedicated academics to manage the incubators from another, while expecting that they have the commercial experiences to support incubated start-ups. As such, the lack of technical experiences within the incubators in the UAE is attributed to the difficulty of outsourcing technical experiences due to the lack of incentives or the challenges of sourcing those experts. Therefore, it is logical to assume that the incubators who have technical resources will have a competitive advantage not only for supporting incubated clients but also for the sustainability of the incubation itself.

A few international studies have also discussed the importance of having a technical team at the business incubation. O'Neal (2005) and Somsuk, Wonglimpiyarat, and Laosirihongthong (2012) believed that the technical team at the incubators are responsible for entry and exit of clients, mentoring, and play the role of subject matter experts in specific stages of the incubation cycle such as evaluating investment deals. Thus, the researchers agreed with the important role of the technical team in leveraging the success of incubators. Lish (2012) agreed with this view; the researcher believed that the success of incubated businesses depends on the level of knowledge and technical experiences transferred by the technical team to incubated entrepreneurs, which will eventually reflect on the success of the incubators themselves. With regards to the incubation studies in the GCC, Alsheikh (2009) agreed with the views of

interviewees at the present study. The researchers stressed having experienced technical staff that can conduct technical activities from the stage of generating ideas until the commercialisation stage, which will ultimately impact on the success of the incubator.

6.2.4 Commercialisation Conditions of the Incubator

When analysing the views of the interviewees with regards to commercialisation capabilities of the incubators, it was found that the ability to “generate and assess entrepreneurial ideas” was one of the most recognised factors by different categories of interviewees. In contrast, when the survey results were analysed, the analysis of respondents have revealed that the incubators in the UAE can conduct programs to generate and assess entrepreneurial ideas, assess the feasibility of new products and services to be commercialized, while they need to improve their services in processing and to register their intellectual property for their incubated clients. As a result, it can be concluded that the outcomes of both results (interviews and survey) were almost aligned in terms of the commercialisation conditions.

6.2.4.1 Generating and Assessing Entrepreneurial Ideas

When looking at interviews and survey results in the present study, it was noticed that generating and assessing entrepreneurial ideas have been recognised by the incubators in the UAE. This implies that the current incubators have considered the pre-stage activities and invested in allocating programs to increase the number of potential ideas that can be commercialised. Those activities can be in the form of acceleration programs, entrepreneurs' competitions, or any other type of activities that has the elements of pitching ideas by the potential entrepreneurs to be assessed by the evaluation committee.

Few international studies discussed the commercialisation activities of the incubators related to generating and assessing the entrepreneurial ideas as one of the enabling factors for their success. In this regard, Meckel (2014) examined how incubators assist entrepreneurs in developing their entrepreneurial businesses; the researcher found that before incubation stage or sometimes during the initial stage of incubation, the incubators conduct short activities that identify potential ideas. As a result, when the incubatees go through such process and get exposed to incubators' community, they will be able to enhance their entrepreneurial ideas, and later be able to develop it during the incubation cycle. Sithole and Rugimbana (2014) agreed with this view; their study concluded that proper selection and assessment exercise through programs might generate potential entrepreneurial ideas, which has a direct influence on accepting technology start-ups at university-based incubators in South Africa.

With regards to the GCC studies discussed generating and assessing entrepreneurial ideas, Khorsheed, Al-Fawzan, and Al-Hargan (2014) highlighted the case of BADIR incubator in Saudi Arabia. The researchers showcased the approach of BADIR incubator in nurturing technology-oriented ideas through sourcing research-based ideas, conducting an initial evaluation for their market feasibly, and conduct workshops for developing those ideas. The researchers noticed that BADIR incubator has invested in the pre-incubation stage, which helped the incubator in two ways; enhancing the application process and accelerate the creation of start-ups during the incubation stage.

6.2.4.2 Assessing the Feasibility of New Products/Services

When comparing the results of interviews and survey in the present study, it will be noticed that the results are somehow aligned. Both findings have shown the importance

of assessing the products and services to be evaluated before entering the open market. This finding can be justified as the feasibility exercise may evaluate prototypes to assess its technical strength as well as indicates for its market potential. Thus, this stage is critical for the incubated businesses before launching the final product or service in the market.

Some scholars have discussed assessing the feasibility of launching new products and services while they are incubated. According to Kamdar (2012), such an assessment should be conducted professionally to determine the potential of products or services. In this regard, the researcher noticed that although this commercialisation role was considered a critical for both the incubators and incubatees, he found that the incubators in India have not been able to conduct it using internal capabilities due to a shortage of technical experiences. As a result, Kamdar (2012) concluded that such a lack of commercialisation capacities might influence on the time of product development, especially in a competitive market, which eventually will have an impact on the incubatees' success.

Few incubation studies within the GCC region have discussed the importance of assessing the incubated products and services. Al-Mubaraki and Schröl (2011) brought the case of the knowledge mine incubator in Sultanate of Oman and how they assess the future products and services through technical expertise, which indicates the importance of such stage until it can be launched in the open market. Also, based on their research reviews, Al-Mubaraki and Busler (2010) advocated for such a role by the incubators to assist in product design, launch, and expansion in the market.

6.2.4.3 Supporting Intellectual Property Protection

Few interviewees at present study have indicated the importance of intellectual property services as one of the enablers for incubations' success. Also, when intellectual property services have been investigated to identify their existence at current business incubators in the UAE, the respondents of the survey have indicated that this service is not highly available, particularly from the incubated entrepreneurs' category. This finding is somehow aligned with the results of Elmansori (2014). Also, the results can be justified as almost 50% of current incubators in the UAE have been established in the last four years, so it is expected that those incubators have not provided this service. Also, providing such as services at incubators requires experienced individuals that can process the registration of the intellectual property and able to customise it based on the targeted market.

Very few studies have addressed the incubators' support in registering and processing intellectual property protection services as one of the enablers for incubations' success. Based on NBIA's industry report in 2016, 55% of their members have reported for such support, which indicates the level of demand in such a service. According to Lish (2012), intellectual property protection services are considered as part of legal services that are provided by the incubators. Based on his study findings, the researcher showed that intellectual property found to be as one of the indicators for the incubators' effectiveness. Moreover, Elmansori (2014) found that the absence of managing intellectual property services was considered as one of the main six obstacles for enhancing innovation practices among SMEs in Libya.

As far as the studies conducted within the GCC region, Elmansori (2014) found that some the UAE incubators provide intellectual property services for their incubated

clients. Alsheikh (2009) evaluated the status of intellectual property services in Saudi Arabia; the researcher believed that government might play a leading role in managing such services by helping local incubators to register and commercialise their intellectual properties rights. However, his study findings revealed that the universities in Saudi Arabia have not put enough attention as part of their policies, although the universities have been able to exploit applied research projects for issuing a patent aiming to be commercialised. The researcher concluded that the lack of awareness about intellectual property services has negatively affected the business collaborations within the community of SMEs in Saudi Arabia.

6.3 Discussion of External Factors of Business Incubation in the UAE

The fourth research objective of this research describes how the external enabling factors, concerning government support, financial resources, market conditions, and entrepreneurship culture are expected to affect the success of business incubators in the UAE. When looking into the analysis of interview results (see Table 22), the findings revealed that the government support and the financial resources factors had the highest attention by the interviewees among the external factors.

The analysis of the survey results has revealed that the government needs to improve their level support for business incubators in terms of their policies, incentives, IP protection, and accessing funds (see Table 39). In terms of the financial resources available for incubators in the UAE (see Table 40), the findings showed that all types of financial resources need to be increased. With regards to the collaboration level with incubators in the UAE, the results revealed that there is more room for collaboration with universities and industry developers in the UAE (see Table 41).

Finally, in terms of the entrepreneurship culture in the UAE, the survey results showed that although there is a high level of acceptance among the community of entrepreneurs to be incubated, however, more efforts need to be done at early stage in order to enhance the entrepreneurship culture, particularly from identifying novel ideas, risk-taking, and identifying future opportunities by entrepreneurs' community (see Table 42). In the coming sections, the four external factors will be further discussed in order to answer the third research question by discussing the impact of their influence on incubations' success in the UAE. Thus, the findings are compared with the results of the international and GCC studies in the business incubation field.

6.3.1 Government Support

It is widely known that governments need to create a conducive business environment that supports entrepreneurship to grow and sustain, particularly in their first year of establishment. When the results of the interviews were analysed, it was found that the government support factor was considered the most critical enabling external factor that may influence the success of incubators in the UAE. However, when the four dimensions of government support have been evaluated through the survey, the overall findings showed that the government is providing outstanding support for the incubators in the UAE. Therefore, to understand better the status of government support offered, the following sections will discuss each dimension of support separately.

6.3.1.1 Policies

When analysing the feedback of incubation management from the survey results, it was noticed that they had rated the government policies as excellent. This can be justified as the majority of current incubators are owned by public sector entities and

operated by government employees. Therefore, it was expected that the respondents would become somehow defensive; particularly in this factor. However, the responses of incubated entrepreneurs can be considered more realistic; their feedback showed that there is a room for improving the existed policies by developing conducive legislative policies for the incubators as well as for the incubated start-ups. Thus, it is logic to give a higher value for the feedback from the incubated entrepreneurs comparing to incubation management category.

On other hand, when analysing the feedback of interviewees concerning the existed policies that are related to entrepreneurship in general and the incubators in particular, the results revealed that 68% of interviewees have indicated the impact of government policies on the success of the incubators, which is considered the highest rate among all other enabling factors. An interviewee from an investor category have mentioned that the public incubators are dominating the incubation market due to the lack of incubation license in the list of authorised activities in the local economic departments. Therefore, several incubators had to operate from free zones authorities.

This situation minimised the entrance for new or international incubators into the UAE, although the UAE is perceived as one of the best countries in the region for supporting entrepreneurship. The interview analysis has shown that establishing businesses and the operating expenses for start-ups in their first year are considered among the highest worldwide, particularly the cost of issuing visas and issuing trade licences. This business environment directed the entrepreneurs and start-ups to reside under free zones, which offers cheaper platforms to operate their businesses and sustain.

Moreover, some other interviewees have raised the limitations of issuing start-up licenses and residence visas for incubated entrepreneurs, which constrain their capacity to grow and scale. Finally, three interviewees from incubation management, investors, and mentors' categories have raised the concern of legal restrictions for faculty members at universities in the UAE to incubate their applied research due to either lack of incentives or to position their case as a conflict of interest. Therefore, some of the interviewees suggested for universities to update their bylaws in order to facilitate the establishment of start-ups. Therefore, the findings the interviews and questionnaire have shown that government policies play a significant role in connecting all the components of the entrepreneurship ecosystem as well as its direct impact on creating exclusive and favourable terms for incubators in general and entrepreneurs in particular.

As a result, all those policy-related challenges have hindered the incubators from expanding their businesses or at least to increase their outcomes in the UAE. However, recent initiatives have been witnessed by some local governments to overcome the challenges of policies. For instance, HH Sheikh Mohamed Bin Rashid Fund for SME Development has offered an exclusive incubation license for the UAE nationals only. They also provided a package for incubated entrepreneurs to issue a start-up license for their businesses and associated with some residence visa under those licenses.

With regards to government policies that relate to business incubators, Sun, Ni, and Leung (2007) agreed with our interviews results, the researchers found that conducive government policies play a significant role in incubations’ success, specifically in directing funds sources toward incubated businesses and facilitating the network between incubated start-ups and their potential government customers.

In the GCC region, Alsheikh (2009) conducted comprehensive research on factors affecting the success of incubators in Saudi Arabia, the researcher agreed with the impact of government policies on the success of incubated businesses. In this regard, his research findings revealed that potential entrepreneurial businesses struggle to enter the market due to some complicated regulations. The researcher indicated that the existed regulations does not facilitate the process or reduce the cost of issuing a license, neither give advantages for entrepreneurs to enter the market, which reduces the feasibility of the business itself. As such, Alsheikh (2009) recommended having more structured discussions between stakeholders in order to address these challenges due to its significant impact on the success of incubated businesses and survival.

6.3.1.2 Incentives

The overall feedback from the interviewees in the present study has considered the government incentives as one of the highest enablers for incubators' success. The results of the interviews showed that almost half of the interviewees (48%) believed that government incentives are crucial for incubators' success. The interviewees also indicated that the most incentives are related to early-stage fund, cost of issuing a license, and issuing residence visas for incubated entrepreneurs.

In the case of university-based incubators, several interviewees have suggested having incentives that encourage students and faculty members to participate in the incubators that are attached to universities. The interviewees have suggested incentives like the accessibility to university resources and facilities, providing training in areas that are needed by incubated entrepreneurs, networking events at universities that bring potential customers and investors to meet the incubated entrepreneurs. These suggestions were aligned with the National Innovation Strategy and Science,

Technology, Innovation Policy in the UAE, which stated the importance of issuing incentives that promotes entrepreneurship practices in the UAE.

On another hand, the overall survey results have shown that the government is somehow providing "very good" incentives for the incubators in the UAE. Similar to the analysis of policies, this finding is mainly based on the perception of government employees who are operating the majority of incubators in the UAE. However, incentives are not only limited to specific inputs that are offered within the incubators, but also related to incentives that impact on customers and suppliers' decisions, exempting specific requirements for entering the market, accessing to potential customers, and subsidising specific fees for issuing a license. All those efforts may give certain advantages to incubated entrepreneurs, which, therefore, increase the chance of their success, and eventually reflects the success of incubators in the UAE.

Scholars in business incubation studies have also discussed the government incentives offered for incubated businesses. Sun, Ni, and Leung (2007) agreed with having exclusive incentives for incubated entrepreneurs. In GCC studies conducted on business incubation, Alsheikh (2009) argued that in order to increase the chance of start-ups at business incubators in Saudi Arabia, a set of exclusive incentives needs to be offered to them such as marketing and fund support that is needed at their early stage of businesses. In this regard, based on the feedback of one of the interviewees from incubation management category, the interviewee number eleven have agreed with the above view, she mentioned that in order for incubated start-ups to grow against experienced existed competitors, they need to have some unfair advantages in funding, networking, and accessing to customers.

6.3.1.3 IP Protection Services

When analysing results of the interviews, it was shown that only one interviewee has indicated that intellectual property service is an enabler for incubators' success in the UAE, which implies that this service is not affecting the performance of incubators. This is not surprising as the incubators in the UAE did not depend on the government to provide such service. Alternatively, they depended on subject matter experts as well as law firms that are specialised in intellectual property services. Overall, strong IP protection services create a suitable business environment for start-ups to be based in UAE and in line with the global standards for protecting innovative ideas.

Few scholars have discussed the support given by the government in terms of intellectual property protection services. Based on the study findings of Alsheikh (2009), the community of SMEs in Saudi Arabia were uncertain about such support by the government concerning intellectual property services. In our study findings, the overall survey results showed that the intellectual property services offered by the government are “very good”, which indicates that the incubators are providing very good service in this regard.

This is somehow justified as the UAE Government initiated some efforts to offer efficient intellectual property services under local economic development departments. For instance, in the Abu Dhabi Emirate, “TAKAMUL” programme, which is under the department of economic development, is mandated to offer comprehensive intellectual property services for entrepreneurs as well as academics that would like to protect their patents. Moreover, the UAE University has established an office that processes and register intellectual property files. Moreover, several law

firms have been based in Dubai that is specialised in intellectual property services, which may offer their services to incubated clients at the incubators in the UAE.

6.3.1.4 Access to Fund

The results of the interviews showed that 40% of interviewees from different categories believed that facilitating funds for incubated entrepreneurs is a critical enabler for incubations' success in the UAE. As far as the results of the survey, it was noticed that there are some variances among the opinion of incubation management and incubated entrepreneurs. Respondents from incubation management felt that the government is doing an excellent job in terms of accessing to fund, while incubated entrepreneurs felt the government needs to give more support in accessing different fund sources.

This result can be attributed to the actual challenges faced by the incubated entrepreneurs, particularly from the non-UAE nationals. At the time that UAE nationals have several options to be funded by different government entities such as Mohamed Bin Rashid Innovation Fund, Sundooq Alwatan, Ruwad, and Mohamed Bin Rashid for SME Development and Khalifa Fund, the options for incubated clients that are non-UAE nationals are quite limited to the funds offered by the business incubators themselves. This type of fund is usually seed fund offered for potential entrepreneurs to develop their concept idea, aiming to develop their business venture, and therefore, source fund from external investors. Thus, more efforts are expected from the government to diversify the sources of the fund such as banks loans and R&D funds at public universities in the UAE.

Although the UAE has successfully attracted international investments to be managed from the country, the interview results have shown that more structured funds of angel investment and venture capital are needed to available for high potential start-ups. The interviewees think that investors have a preference to invest in start-ups registered outside the UAE due to the lack of legislation that support start-ups in the UAE domain.

Few researchers discussed facilitating the accessibility of fund sources for incubated entrepreneurs. According to the results of Sithole and Rugimbana (2014), the researchers argued that government can direct the financial resources for the benefit of incubated start-ups, mainly when there is a strategic benefit for the country. Also, Smilor (1987) agreed with this view; the researcher suggested for local governments to dedicate some seed fund for initiating entrepreneurial ventures, which may incentivise other sources of funds to participate in the investment.

6.3.2 Financial Resources

Based on the interview results, the interviewees have identified the factor of financial resources as the most critical external factors that may impact the success of business incubators in the UAE, particularly the funds coming from venture capitalists. When the above findings were verified through the survey questionnaire, the results revealed that all types of fund sources need to be increased for incubated entrepreneurs, particularly the type of bank loans and R&D funds at universities. Therefore, the findings of both interviews and survey have shown the critical need for different types of financial resources for funding entrepreneurial ventures at business incubators in the UAE.

6.3.2.1 Government Funds

The findings of the survey results indicated that 33.3% of respondents think that the government fund is not available. This percentage of view by both categories of respondents imply that more government funds are needed for incubated entrepreneurs. Also, around 25% of respondents from incubated entrepreneur's category have indicated that government fund is either slightly available or moderately available for incubated businesses, which corresponds with the findings of Alsheikh (2009) in Saudi Arabia. This finding can bring the attention of the level of collaboration between government fund entities across the local Emirates and the existed incubators in those emirates. However, in the case of Khalifa Innovation Centre in the Abu Dhabi Emirate, Khalifa Fund is considered as one of the principal founders, which supported the establishment of the Centre and funded the initial entrepreneurial projects that were incubated. Therefore, government funds can be considered as a critical enabler for business incubators to succeed in the UAE (Andersson et al., 2010).

Several studies supported the findings of the present study, particularly in terms of the availability of government funds. According to the study of Kamdar (2012), the researcher found that the supply of systematic funding in India from government has a direct impact on the core operation of incubators, and therefore, on their long-term success. This finding corresponds with the interviewees' view at present study on the role of government in facilitating fund sources for incubated businesses.

Concerning the existing incubation studies within GCC region, the findings of Alsheikh (2009) revealed that several national development plans had been declared for supporting the SMEs in terms of providing loans and funds, however, still, the segment of SMEs coming from the incubators faced challenges to receive such fund.

The analysis of his study results revealed that the challenges are not because of a lack of government funds or loans but due to the complexity of the process itself. In this regard, Alsheikh (2009) stressed the critical roles of mentors at the incubators in supporting and facilitating fund applications from the related government agencies.

6.3.2.2 R&D Funds at Universities

The overall findings showed that R&D funds at universities are moderately available in the UAE. This finding is not surprising. Based on the review of the three university-based incubators in the UAE (UAEU incubator, Khalifa Innovation Centre, and StartAD), the results showed that that the activities of their incubators are not integrated with the research projects at those universities. However, very few related research cases have been incubated like the case of biotechnology project in Khalifa Innovation Centre. Also, although the government has allocated a sufficient amount of fund in the R&D programs, those amounts have not been directed to address industry problems.

In contrast, Obeidat and Abu-Shanab (2010) found that applied research projects have been incubated and offered seed grants in Jordan Innovation Centres to initiate their businesses. Thus, based on the above results, it can be suggested that public universities in the UAE in particular, need to integrate innovative entrepreneurial ideas as part of their R&D budget. Also, the interview results at present study have shown that R&D funds are also critical enablers for incubations' success. Therefore, in order for university-based incubators to succeed, the sponsors of the universities in the UAE needs to dedicate some of their funds into their incubators.

Few scholars have discussed the R&D funds at universities as part of financial resources offered for incubated entrepreneurs. Verma (2005) agreed on the importance of having different fund sources offered for incubators in order to succeed. GCC related studies have also supported this view; according to Elmansori (2015), the researcher agreed with the idea of offering funds from R&D centres in order to support the incubated businesses. This finding is also aligned with the National Innovation Strategy in the UAE, which advocated for supporting applied research financially, aiming to turn them into commercial ventures.

6.3.2.3 Other Funding Sources

The overall analysis of the interviews has shown that bank loans are not available as a source of fund for incubated businesses in the UAE. This is attributed to acceptance criteria that is related to the risk factor of funding entrepreneurial projects, while they are more in favour to invest in mature businesses, which also have a higher expected return.

With regards to the survey results concerning other sources of funding, such as private financial sectors, venture capital fund and a bank loan. The findings of the present study somehow showed more acceptance of this type of fund comparing to the results of Alsheikh (2009). This is justified mainly due to the maturity of venture capital in recent years comparing to the year of conducting the study of Alsheikh (2009). Nevertheless, the country witnessed recent grow in the number of venture capital funds targeting potential start-ups such as Wamda Capital and BECO Capital.

As far as private sector funds offered for incubated businesses are concerned, the survey results showed that this source of fund is somehow available based on the views

of incubated entrepreneurs, while the respondents from the incubation management have indicated that this type of fund is highly available. The variance of views between both categories could be attributed to the method of spending. At the time that incubation management may utilise private sector fund as part of sponsoring the general activities of the incubator, incubated entrepreneurs are expecting to utilise this type of fund on the incubated businesses. This is because the private funds target mature start-ups that are well-established and resides at potential markets such as Silicon Valley.

On another hand, the results of the interviews have determined private sector funds, bank loans, and mainly venture capital funds as enablers for incubators' success. In contrast, Elmansori (2014) found that public owned incubators depend on government funds, while private business incubators depend mainly on their sponsors. Therefore, the researcher found that venture capital fund and angel investment have no major impact on incubators' success. However, Elmansori (2014) believed that the funding experience by incubation management has a significant role in accessing those specialised funds such as venture capital and angel investment. This implies that the availability of those three types of fund also depends on the background and the experience of incubators to deal with those fund sources, in which it maximises the benefits of their incubated start-ups. Also, the current bylaws and the governance system at the current operating incubators need to consider these type of fund sources.

Scholars around the world have also discussed alternative fund sources for incubated businesses. Kamdar (2012) found that incubation centres in India highly depend on government grants due to their philanthropic background. Therefore, fewer efforts have been put to find alternative sources. The researcher argued that such a situation

limits the fund options for incubated businesses, which will put the operation of the incubation centres at risk. This circumstance is quite similar in the UAE, particularly with government-owned incubators, their dependency on government budget did not incentivise them to act like private incubators and seek alternative sources of a fund like banks, venture capital, and the private sector.

In the GCC region, Alsheikh (2009) highlighted several studies that indicated the funding challenges faced by SME segment in Saudi Arabia; mainly if those young businesses are technology oriented. The researcher found that the banks in Saudi Arabia have classified those projects as "high risk", and therefore, minimised the opportunities of giving loans to them. Also, his study findings (which was in 2009) revealed that incubated entrepreneurs in Saudi Arabia did not consider venture capitalists as an alternative source of funds, which can be justified as this source of fund is considered relatively new in all GCC countries. Alsheikh (2009) concluded that when business incubators act as guarantor, there is more chance to diversify the sources of fund for SMEs in general and the incubated clients in particular. Therefore, the above findings are somehow aligned with the results of the present study.

6.3.3 Market Conditions in the UAE

When the interviews' result has been analysed, considerable views showed their concerns on the collaboration with universities as one of the most critical enablers for incubations' success. As far as the findings of survey results, respondents from incubation management category believed that the collaboration level between the incubators in the UAE with universities and industry developers are excellent. However, the incubated entrepreneurs believed that there are more efforts that needs to be done for enhancing the collaboration level with those two segments. The

following sections will further discuss the collaboration status with those two segments.

6.3.3.1 Collaboration with Universities

The overall findings in the present study reveal that the collaboration level between universities and business incubators in the UAE needs to be enhanced. While the incubators need to access universities, particularly enabler incubated entrepreneurs to benefit from the technical resources, universities, on the other hand, are also expected to have a systematic link with the industry through applied research, aiming for solving industry problems through R&D projects.

This type of collaboration will become more comfortable when a platform such as business incubators exist within the university premises, primarily when they are supported by the government entities. However, such collaboration requires radical updates in legislation at universities that facilitates the utilisation of resources, as well as incentivise the students and faculty members to participate in the university-based incubators.

In this regard and based on the interviewees' feedback representing some of the university-based incubators in the UAE, it was noticed that the university-based incubators need to develop comprehensive governance that regulates the creation of start-ups, patent registration, patent ownership, funding mechanism, and the process of spin-off start-ups. Nevertheless, due to different goals carried by industry and universities from conducting research, incubators may play a critical role in bridging this gap and align the interest of both sides through commercialised applied research.

The previous studies conducted globally have also encouraged to strengthen collaboration with universities. Kamdar (2012) stressed the importance of systematic collaboration for exploiting technical facilities such as labs for incubated businesses, particularly with incubators that are attached to universities. The researcher believed that the more technical resources at universities are utilised by incubated entrepreneurs, the more chance for products and services to be realised. This view is aligned with some of the interviewees in the present study, which highlighted the role of universities in supporting incubators by facilitating the use of labs and technical resources at universities.

As far as the studies discussed the collaboration between universities and business incubators in the GCC region, the findings of Alsheikh (2009) revealed that collaborating with universities would highly utilise the related expertise, which will somehow encourage for further collaboration with universities. Also, the researcher indicated that although few exchanges of expertise have been conducted between universities and industry on an ad-hoc basis. However, his research revealed that the overall relationship between universities and industry in Saudi Arabia is not satisfactory, which is considered a contrary indicator for business incubators in Saudi Arabia. This finding is aligned with our interview results, which revealed the importance of collaboration with universities in many dimensions as one of the enablers for business incubators to succeed.

6.3.3.2 Collaboration with Respective Industry Developers

The findings of the present study have indicated the importance of building connections with different industries by the business incubators in the UAE in order to support their incubated businesses. This is justified as industry developers are

expected to enhance their sectors by facilitating the support of engaging SMEs in their respective sectors and avoid the dominations of large corporates. In the UAE case, there are seven sectors that are targeted to be innovative based on the UAE innovation strategy. Therefore, the respective regulators in those seven sectors are expected to introduce more innovative products and services to their sector, as well as increase the SME segment as per the national innovation strategy.

Due to the limited size of the market in the UAE, incubators need to maximise the support offered by the regulators in those sectors to facilitate the accessibility to local and international customers that are based in the UAE. In this regard, the UAE government has issued a framework for public-private partnerships in order to facilitate collaboration and under a conducive law. Therefore, it can be assumed that the stronger relationships between the incubators and the regulators in the seven targeted sectors, the more likely the incubated start-ups will be exposed to potential customers. This could be realised through incentives as well as systematic collaborations with incubators in the UAE. Thus, their collaboration with incubators can be assumed very critical for the success of incubated businesses, and eventually for the success of incubators themselves.

Some scholars encouraged for such collaborations, which may support the incubated businesses to succeed. Smilor (1987) argued that the incubators might have a competitive advantage when they can fill the networking gap between the incubated businesses and their respective industry. In this regard, Hoeser (2003) regarded one of the incubators' success factor in Brazil and Argentina, to their willingness to networking with important industries. Also, based on their findings, Sithole and Rugimbana (2014) recommended that incubators should have professional

connections with business agencies that can provide additional support for incubated businesses.

With regards to collaboration between incubators in GCC countries with different industries, and based on his study findings, Alsheikh (2009) stressed on engaging Saudi SMEs (including the incubated ones) with corporates in different sectors. His study showed that significant responses of SMEs were negative towards the collaboration with other corporates for several reasons such as cost, previous experiences, or a weak relationship. Also, Khorsheed and Al-Fawzan (2014) encouraged collaboration between research at universities and private industries due to its positive impact on the national innovation ecosystem. The researchers highlighted the case of Technology Innovation Centres in Saudi Arabia as a successful platform for such collaboration in commercialising incubated research projects. Moreover, Al-Mubaraki and Schröl (2011) agreed with the above views as they recommended for corporates to dedicate more of their budget to R&D and entrepreneurial ventures.

6.3.4 Entrepreneurship Culture in the UAE

In any country, cultural perceptions may guide the community of entrepreneurs and influence their behaviour. In the UAE case, the business community is very competitive. However, at the time that the entrepreneurs and start-ups are more in favour of risk-taking and adaptive to recent trends and new technologies, the investors rely more on large and well-established corporations.

When it comes to the cultural factor, the results of the interviews have shown that the entrepreneurship culture was under less attention by interviewees comparing to other

enabling external factors that may influence the success of incubators in the UAE. However, the element of risking taking by the community of entrepreneurs in the UAE was highly recognised among the four dimensions of entrepreneurship culture, which is likely going to impact on sourcing of entrepreneurs at the incubators. With regards to the findings of the survey results, the overall analysis has revealed that the community of entrepreneurs has somehow a very high level of acceptance to be incubated in the UAE. However, the responses have shown that the entrepreneurship culture can be further improved in order to become an effective enabler for the incubators to succeed in the UAE.

As such, it can be concluded that the findings of both interviews and survey results are not highly aligned in terms of the need for improving the entrepreneurship culture in the UAE, particularly in the risk-taking dimension. In the following section, further analysis will be conducted to identify the differences.

6.3.4.1 Novelty of Ideas

Advanced economies rely heavily on novel ideas developed by highly knowledgeable individuals. Such a pool of novel ideas depends on the advanced education system, particularly in STEM fields and supported by entrepreneurial as well as job-related skills. In the UAE case, entrepreneurs in the STEM field are still underdeveloped, which needs to be enhanced in order to play knowledge-based roles in the targeted industries.

The results in present study have showed that only two interviewees have indicated the importance of identifying novel ideas from entrepreneurs' community as important enabler for incubators' success, while the survey respondents have rated the novelty

of ideas within the entrepreneurs' community as "*high*", which indicates that the incubators in the UAE are not affected by the flow of novel ideas. Also, it implies that the entrepreneurs' community somehow is exposed to previous experiences and business opportunities that helped them to identify unique ideas, which has the potential to be commercialised.

However, when reviewing the characteristics of incubated entrepreneurs in the UAE, it was noticed that the majority of incubated clients are from the undergraduate category. Also, when revising the level of involvement by the faculty members in the business incubators, the results did not find high involvement, which implies that the applied research that is developed by the faculty members are either not incentivised to be incubated or the current legislation prevents them from doing so.

Scholars in different countries discussed the entrepreneurship culture and its relation to business incubation. With regards to the availability of novel ideas by the community of entrepreneurs to be incubated, Aernoudt (2004) believed that sustaining the supply of entrepreneurial ideas may play a significant role in sustaining the operation of incubators. Regarding the studies within GCC region, the study findings of Alsheikh (2009) have shown that the low exposure of students to actual work experiences in Saudi Arabia have affected negatively on the flow of entrepreneurial ideas to business incubators. Thus, his study finding is aligned with our interview results, as several interviewees representing different stakeholders of incubation in the UAE, have indicated for the importance of sourcing potential entrepreneurial ideas as one of the enablers for incubators' success.

6.3.4.2 Risk Taking

The UAE business environment tends to adopt less risk-embracing approach by depending on more well-established companies, which gives to extend more job security. The results of the survey in the present study have shown that the overall risk-taking behaviour is somehow is "high" in the UAE. In contrast, a substantial number of interviewees (36%) have identified the risk-taking factor as one of the enablers for incubations' success. This can be justified as entrepreneurs' community needs to understand the risk of dealing with future uncertainty while progressing their entrepreneurial ideas and expecting that there could be a chance of loss or profit equally. Also, the local governments in the UAE have put extensive efforts recently to increase the awareness of entrepreneurship as a career choice from a strategic perspective by introducing certain incentives.

Also, it is also worth mentioning that due to the scarcity of jobs in the UAE in recent years, there was a driving force towards pursuing private businesses, particularly with the recent incentives offered by different incubators in the UAE. Furthermore, with regards to the females' behaviour towards risk-taking, and based on the review of UAE University incubator case, it was noticed that due to the scarcity of job opportunities within Al-Ain city, it was noticed that majority of incubated entrepreneurs were females. All these efforts and circumstances have helped in increasing the risk-taking behaviour among entrepreneurs' community in general in the UAE.

Some business incubation’s studies supported the risk-taking factor as an enabler for incubators’ success. According to Burnett (2009), the risk-taking level is a critical behaviour that drives entrepreneurial ideas to be developed, while dealing with the uncertainty of losing assets. In the GCC region, Alsheikh (2009) found several

influencing factors such as the scarcity level of jobs at the government, which forced the new generation to look for an alternative career. Therefore, the researcher believed that the business experience background of parents had influenced the individual's decision in taking the risk of pursuing a new business venture and supported by their previous experiences. The researcher concluded that the high business culture has somehow forced the new generation to increase the risk-taking behaviour for starting their businesses, which eventually become a positive enabler for incubators in Saudi Arabia.

In the UAE domain, when researching the risk-taking factor, Al Saiqal (2017) found that young national in general have a low intention of starting their own business, particularly with females. However, the researcher indicated that such behaviour has started to divert due to a decrease in job opportunities at public sector from one side, and the increase of incentives by the government to pursue private businesses as an alternative career from another. Thus, the risk-taking can be considered as an essential factor for the success of business incubators in the UAE.

6.3.4.3 Identifying Future Opportunities

The UAE Government has continuously embedded entrepreneurship activities into schools, aiming to develop the future generation of entrepreneurs by exploring innovative ideas. Those activities have helped to increase the willingness of experimenting with new ideas among the young generation. When looking into the overall survey results, it was noticed that entrepreneurs' community in the UAE tend to have high intention toward identifying future opportunities. This finding implies that entrepreneurs in the UAE are willing to experiment with their ideas, especially when such a platform like incubators are provided. Also, it was noticed that from a

legal perspective, students in particular in the UAE are secured to develop their entrepreneurial ideas at university-based incubators without having a fear of losing a job or have a concern in accessing the university facilities. Thus, such a situation at universities will enhance the flow of ideas, which will enable to select the best potential ideas by the incubators to be nurtured and developed.

Few studies have agreed with the impact of identifying future opportunities as part of enabling factors for incubators' success. Hackett and Dilts (2004b) encouraged practicing new ideas that may lead to developing new products or services by incubated entrepreneurs. Therefore, such an environment will benefit the incubators in sustaining the sources of entrepreneurial ideas and enhance the quality of sourced ideas. GEM Report (2017) agreed with this view, according to their report, experimenting and developing new ideas to be commercialised in the future reflects as one of the key mature practices of entrepreneurship. As such, identifying future opportunities can be considered as one of the enabling factors for the success of business incubators in the UAE.

6.3.4.4 Willingness to be Incubated

Due to the novelty of incubation concept in the UAE comparing to advanced countries such as the United States, this study intended to understand the willingness level among entrepreneurs' community to be incubated at different business incubators available in the UAE. In this regard, the result of interviews at present study has shown that only 20% of interviewees have considered the willingness level of being incubated as one of the enablers for incubators' success in the UAE. This finding is not surprising as the majority of current incubators were established after 2014.

On the other hand, when comparing this finding with a similar study in Saudi Arabia, it will be noticed that the entrepreneurs' community in the UAE are more favourable to be incubated comparing to Saudi Arabia. However, it is worth mentioning that the Saudi study has been conducted almost ten years back, which needs to put into consideration as the majority of incubators in both countries have been established less than ten years. Therefore, with the recent trends towards promoting entrepreneurship practices in the region, it is expected that the perception of the incubation concept is going to be more appealing.

Also, incubators in the UAE tend to put extensive efforts to market themselves through social media, which is considered as the main source of marketing among the entrepreneurship community. According to the interviewees' feedback in the present study, the entrepreneurs' community in the UAE became more aware and responsive to the activities and programs that are offered by the business incubators in the UAE. As a result, all those efforts have helped in increasing the perception of being incubated in order to develop their entrepreneurial ideas in a supportive environment like incubators.

6.4 Discussion of Perception of Incubations' Success in the UAE

The first research question addressed what business incubation success looks like in the UAE. Therefore, based on the survey results, it was found that the criteria of graduating entrepreneurs from the incubators, creating start-ups, sustaining start-ups in the market, and creating jobs had the highest views as a method of defining incubations' success in the UAE as shown in Figure 14. Also, the results of the interviews have shown that the criteria of sustaining incubated businesses in the market had the highest view (52%), followed by creating start-up companies out of incubators

(36%), and then graduating entrepreneurs (28%) as the third preferred success criteria. On the other hand, the survey results have shown that the overall success level of current business incubators in the UAE have ranged from 75.1% to 67.1%. Therefore, it can be concluded that the survey results were almost aligned with the results of the interviews.

However, when Elmansori (2014) researched business incubators' performance and success measures in Jordan and the UAE, the researcher found that entrepreneurs' efficiency, the success of incubated start-ups, and financial strength of the incubators were the most success criteria revealed by his study findings. Nevertheless, those success criteria are somehow related to the results of our study due to the following reasons:

i] The efficiency of the entrepreneurs reflects their ability to progress during the incubation cycle and graduate from the incubator by establishing a start-up company.

ii] The success of the incubated start-ups indicates the readiness to enter the open market by generating recurring revenues from customers.

iii] The financial strength of the incubator (mainly private incubators) indicates for accepting and investing in the right entrepreneurs that were able to progress their businesses and gain some equity in those potential start-ups.

The study findings show that there is a wide range of measures for monitoring the incubators, which has not been agreed on due to the lack of authorised public entity to standardise those measures. In the following sections, further justifications will be discussed on adopting those three success criteria. In addition, the findings will be

compared with the results of the international and GCC studies in the business incubation field:

6.4.1 Graduating Entrepreneurs

The study finding mainly justifies the graduation of entrepreneurs from the incubators in the UAE as one of the success criteria due to dominating government incubators in the country. The initial demographic results of the study (see Table 24) showed that the majority of incubators are owned by government either in the form of attaching to public universities (e.g., UAEU incubator) or a government entity that supports SMEs (such as Hamdan Innovation Incubator) or through partnerships (e.g., Khalifa Innovation Centre). Those government entities are service oriented and mainly mandated to support young entrepreneurs in different forms such as taking them to the business incubators.

Therefore, the primary objective of public owned incubators is to conduct activities that source, select, and develop potential entrepreneurs through the incubation cycle, and therefore, to be graduated with potential business opportunities. In this regard, Verma (2005), Blackburne (2014) and Burnett (2009) supported developing the success criteria based on sponsors' objectives. Also, the previous GCC studies conducted on business incubation have agreed with this criterion. The findings of those studies have shown that 32.1% of those studies have indicated that the success criteria is measured based on the graduating entrepreneurs from the incubators.

Also, the incubators that are owned by the government have not developed a policy for investing or acquiring equities in potential incubated businesses. Thus, they were not able to set a measure that is beyond their mandate, particularly when the

entrepreneurs leave the incubators. As a result, the success criteria set by the government-owned incubators are more of input-oriented that reflects their mandates.

6.4.2 Creating Start-ups

Creating start-ups measure as one of the success criteria for incubators in the UAE can merely be justified due to the quest of the UAE Government to increase the source of employment away from government jobs by raising the number of SMEs in the market. In addition, the government seeks to achieve its national innovation strategy, which requires introducing new products and services through entrepreneurial businesses that enter the market and supported by conducive policies.

Creating start-ups has always been a recommended success criterion for business incubators by scholars and industry professionals. For instance, Hackett and Dilts (2004) supported measuring the success of incubators based on generating start-ups whether they are sustained in the market or at least growing toward sustainability. Lish (2012) agreed with creating start-ups as a measure of success, particularly for-profit making incubators due to their financial value during the spinouts. Moreover, considering the opinion of related professional association in the method of measuring the success of incubators, the National Business Incubation Association (NBIA, 1985) supported this measure as one of the key three measures for incubators' success.

With regards to the views of GCC studies on incubations' success, Al-Mubaraki and Busler (2015) believed that the creation of start-ups reflects the incubators' objectives, while EL-Midany and Shalaby (2009) supported this measure due to its impact on creating jobs and wealth. Finally, based on the reviews of GCC studies in business

incubation field, it was found that 35.7% of GCC studies have indicated for the start-up creation as a method of incubators' success.

6.4.3 Sustaining Start-ups in the Market

The criteria of sustaining start-ups in the market are justified for several reasons. First, the management at incubators in the UAE is concerned with creating success stories of incubated start-ups that sustained their businesses in the market, which will help them to attract more investors for their incubated start-ups. Second, the investors are interested in scouting for scalable graduated start-ups that have the potential to grow, and therefore, maximise their return on investment.

Third and finally, the UAE government is seeking to secure future jobs away from the public sector mainly through increasing the number of SMEs in the country. Therefore, sustaining incubated businesses in the market is aligned with this direction due to its positive impact on socio-economic plans. Therefore, while the start-ups grow in the market, they are expected to create more jobs for the community. In the same time, they are expected to support the local economy through successful SMEs based in the UAE. However, due to the small population of the UAE and to sustain the growth of incubated start-ups, business incubators need to promote their incubated start-ups globally starting from MENA region, while supported by successful raise of funds.

On the other hand, this criterion had the highest view based on the results of the survey as well as interviews in the present study. Scholars around the world agreed with this criterion of success. According to Voisey, Gornall, Jones, and Thomas (2006) and O'neal (2005), the scholars believed that the incubators are successful when they can sustain their incubated businesses in the market without their interference. As far as

the perception of the GCC studies, the literature reviews conducted on the 28 identified studies have shown that almost half of the studies (46.4%) supported adopting this criterion.

Al-Mubaraki and Busler (2013); for instance, encouraged establishing start-ups that will graduate from incubators and become financially independent, and aiming for their contribution to the local economy. In addition, Khorsheed, Al-Fawzan, and Al-Hargan (2014) supported the sustainably of start-ups as a measure of success. Based on the instruction of the advisory board of BADIR incubator in Saudi Arabia, the researchers agreed with producing incubated businesses that are economically self-sustaining.

6.5 Discussion of Business Incubators' Roles in the UAE

The second research objective of this study seeks to examine the roles of incubators in supporting the UAE's strategic objectives in general and promoting entrepreneurship practices in particular. At the strategic level, the interview results showed that nurturing entrepreneurs is the most important roles expected from business incubators (see table 23), while other expected roles were significantly considered. On the other hand, the survey results have highly agreed with the roles of incubators in developing entrepreneurship culture, contributing to the local economy, and supporting national innovation strategy in the UAE at the strategic level (see Figure 16). As far as the expected roles of incubators from entrepreneurship's perceptive, the survey results have also agreed with roles of incubators in nurturing entrepreneurs, creating jobs, and commercialising new products/services (see Figure 17).

Therefore, it can be concluded that the survey results were almost aligned with the results of the interviews. In the following sections, the expected roles will be further discussed in order to answer the fourth research question (what are the expected roles of business incubators in the UAE?) through the following sections with justifications. Also, the findings are compared with the results of international and GCC studies in the business incubation field.

6.5.1 Developing Entrepreneurship Culture

When it comes to strategic roles such as developing entrepreneurship culture in a country, it is logical to assume that the local government is expected to take the lead by using the right stakeholders (such as business incubators) to enhance the entrepreneurship culture. In this regard, Hedner, Busler, and Abouzeedan (2010) expected from the incubators to support the entrepreneurship culture through their entrepreneurial programs and activities.

On the other hand, when the incubation studies in the GCC region were analysed, it was found that enhancing the entrepreneurship culture were considered as one of the least important roles expected from incubators within the GCC region. This can be attributed to incubators' mandate in the UAE, which does not explicitly accommodate the objective of developing entrepreneurship culture although they are an enabler for it. In this regard, when Elmansori (2014) conducted a study on business incubation practices in Jordan and UAE, he recommended that the incubators should reinforce entrepreneurship practices in the UAE and act as an enabler for building a new generation of entrepreneurs. Alsheikh (2009) agreed with this role from the incubators as it is considered a critical element for increasing the community of entrepreneurs in the country by taking the risk of experimenting with new ideas.

6.5.2 Contributing to the Local Economy

The results of the interviews at the present study has shown that contributing to the local economy was considered as one of the top three roles expected from the incubators in the UAE. As far as the survey results on incubators' roles in the UAE, it was found that the role of contributing to the local economy is extremely important (see Table 45) based on the overall results (44.7%). In this regard, Aberham (2011) agreed with this critical role, the researcher highlighted the potential of technology-oriented incubators in contributing to the economic growth through the commercialisation of technologies, particularly from the university-based incubators.

These findings were also aligned with the incubation studies conducted within GCC domain; the literature review conducted on 28 studies in GCC countries revealed that contributing to the local economy is considered the highest important role expected from incubators (see Table 12). Al-Mubaraki and Busler (2013) believed that incubators are effective platforms for inserting SMEs in different local industries, which may increase the local suppliers that can provide value-added products and services in the market.

Moreover, when the results of the interviews were further analysed, it was noticed that some of the interviewees think that incubators may help in increasing the contribution of SMEs in the local economy and support introducing innovative products and services, which enhances the transition to a knowledge-based economy. Also, investors, as well as incubation management representatives that have been interviewed, think that incubators may contribute to the country's GDP through value-added products and services. Alsheikh (2009) agreed with this approach; the researcher believed that the existence of new value-added firms created and supported by local

incubators would also support solving the employability challenges as well as enhancing the economic specialisation in the country.

6.5.3 Supporting National Innovation Strategy

Based on the results of the interviews, it was found that 40% of interviewees are expecting from incubators in the UAE to support the national innovation strategy. On another hand, the overall analysis of the survey showed that playing this role by the incubators in the UAE are either extremely important (54.1%) or important (23.5%), which indicates the alignment of the findings among the interviews and survey results.

Due to the uniqueness of this role that is expected from the incubators in the UAE, it was a challenge to find studies that investigated this role. However, Böhringer (2006) recommended establishing specialised incubators that are tailored to support specific sectors as part of the country's strategic plans. With regards to the incubation studies within the GCC region, although supporting innovation role is considered relatively unique to be played by the incubators at the GCC countries, Alsheikh (2009) indicated the potential opportunities of Saudi entrepreneurs to produce innovative products or services through local incubators, which can leverage the success rate and the sustainability of those SMEs in the market.

Thus, assigning the role of supporting innovation strategy to business incubators in the UAE is justified due to several reasons. First, couple university-based incubators have been established by the government (such as UAEU incubator and Khalifa Innovation Centre), aiming for producing new innovative technologies that can be commercialised. These initiatives are expected to build a solid foundation for embracing innovation practices in the country. However, due to the recent nature of

those incubators and their sizes, it is expected that initiative may take time to benefit the country and eventually contribute to the local GDP.

Second, some specialised incubators have been launched or under development, which targets specific industries (such as INTELAK incubator serving tourism and aviation industry), to introduce innovative products and services in those sectors. Third, and finally, the UAE government has considered business incubators as one of the key enablers that support innovative practices in the country. Thus, it is expected from public funded incubators to evaluate their outcomes and examine to what extent they are supporting the national innovation strategy in the UAE in the form of creating innovative products and services.

6.5.4 Nurturing Entrepreneurs

The analysis of interviews has shown that developing entrepreneurs' capabilities is the main priority of incubators in the UAE. Also, the findings of the survey results were aligned with the results of the interviews. The overall analysis of the survey has shown that nurturing entrepreneurs is an extremely important role (83.3%) that is expected from incubators in the UAE. This finding was aligned with the results of several international studies conducted on business incubation. Claggett (2003) considered nurturing entrepreneurs is part of business formation roles during the incubation cycle, in which they need to support entrepreneurs by developing their ideas until commercialisation stage through a series of activities. Also, several studies agreed with the role of incubators in developing entrepreneurial skills through technical development programs, which are needed in the real-life businesses (Castro, Galán, & Bravo, 2014; Aberham, 2011).

Regarding the GCC studies conducted on business incubation, the analysis of those studies has revealed that nurturing entrepreneurs should be part of incubation roles. Madichie (2010) emphasised incubators' roles in graduating capable entrepreneurs that could face business environment challenges. Byat and Sultan (2014) agreed with such a role by the incubators due to its critical impact on the experience of entrepreneurs, which reflects on their ability to develop unique products and services and launch it in the market.

Thus, the role of nurturing of entrepreneurs can be rationalised simply, because incubators are considered an efficient and effective platform to learn and practice entrepreneurship before entering the market. The learning occurs at the incubators through customised activities and programs during the incubation cycle, which enables learning new skills, gaining new knowledge, and practicing real experiences. These set of exposure helps collectively to develop specific competencies need by entrepreneurs. Also, assigning mentors for each entrepreneur, which is usually provided at the incubators, is one of the best approaches that entrepreneurs can learn. The mentors usually facilitate combining the capabilities of incubated entrepreneurs with the services offered by the incubators, which helps toward progressing their businesses.

Furthermore, incubators may compensate for the low level of learning and experience of entrepreneurs during their undergraduate studies period, which could be accelerated during the incubation cycle. Finally, from the UAE perspective, the leadership of the UAE government has always emphasised on building national capabilities, which eventually reflected in all national strategies at the seven targeted industries. Thus, it is expected from nurturing UAE entrepreneurs to develop their technical capabilities

and enhance their employability in worst seniors if the entrepreneurs did not pursue their entrepreneurial journey.

6.5.5 Creating Jobs

It is agreed that creating high-impact entrepreneurial ventures, particularly in STEM fields is considered an efficient source of employment, especially in a country like UAE with young populations. As the proportion of the UAE nationals employed at public entities is one of the highest in the world and the fact that those entities are saturated and seeking to outsource their services, it is crucial for the government in securing alternative sources of jobs such as entrepreneurship, therefore, the UAE government is willing to invest in business incubators in order to graduate successful businesses.

The analysis of interviewees' feedback has revealed that the incubators are expected to create jobs through their incubated entrepreneurs' businesses. The findings showed that more than half of interviewees (52%), mainly from interviewees representing government entities believed that incubators might benefit the country in creating job opportunities through growing incubated start-ups. This category of respondents stressed this role due to the employment pressures faced by the public sector to secure future jobs for the new generation of the UAE nationals.

On the other hand, the survey results have shown that only 37.6% and 24.7% of overall responses believed that the role of creating jobs is either extremely important or important respectively. The low level of agreement on the importance of this role can be attributed to the core mandate of the incubators, which may not include the role of creating jobs although they can facilitate it through their growing incubated businesses.

However, due to the limited range of incubated businesses, start-ups do not have a wide range of jobs to be offered comparing to other countries like Egypt and Saudi Arabia, which has larger pools of businesses within STEM fields. Therefore, diversifying the range of job opportunities within the incubators might take time.

Several international researchers agreed with the contribution of business incubators in providing jobs. According to Aberham (2011), the researcher found that different types of incubators may offer job opportunities on a full or part-time basis. Mian (1997) agreed with this role; his research findings revealed some quantifiable numbers of jobs created by university-based incubators in the United States.

As far as business incubation studies conducted within the GCC countries, AL-Mubaraki and Busler (2014) found that creating jobs as well as new SMEs are the most two tangible outcomes gained from the incubators. The researchers believed that the incubators are active enablers for shifting the mind-set from government jobs to private. Khorsheed, Alhargan and Qasim (2012) agreed with this view; the researchers considered the incubators as an alternative source for the employment in the private sector in the GCC region. In the case of Saudi Arabia, Alsheikh (2009) argued that a significant number of Saudi graduates from local universities are facing employment challenges. As a result, the researcher believed that successful university-based incubators in Saudi Arabia might provide jobs through newly established businesses for the local community in order to reduce the public employment pressure, and in the same time promote for entrepreneurship culture.

In the UAE context, the results of Elmansori (2014) have indicated that incubators may positively impact on creating jobs in Jordan and the UAE similarly. As such, this role is justified to be played by the incubators in the UAE due to the vital role they may

play in addressing socio-economic aspects such as employability from a social perspective, as well as producing competent UAE graduates that are equipped with skills and experiences from an economic perspective.

6.5.6 Launching New Products and Services

It is known that countries that are more dependent on natural resources may not sustain the growth of their economy. As such, SMEs are created to disrupt the traditional ways of doing businesses by introducing more value-added products and services. Therefore, the restrictions reside around innovative businesses may limit the accessibility of start-ups in the market. The results of the interviews have revealed that 40% of interviewees have considered commercialising new product and services as one of the critical roles expected from business incubators in the UAE. Interviewees that represented government stakeholders have stressed on this role as it enables the country to diversify its economy away from oil sector and therefore, support the transition to knowledge-based economy, while the interviewees from incubation management category believed that incubators are efficient system to filter and produce value-added products and services that address actual needs of the customers.

On another hand, the results of the survey have shown that the overall responses think that commercialising new products and services is either extremely important (45.9%) or important (23.5%). Thus, the country needs to enable business incubators to accommodate potential ideas that can turn to new innovative products and services, and therefore, support them to be introduced in the market. Several international scholars that researched business incubations have agreed with the importance of this role to be considered by the incubators. Hires (2010) for instance, believed that the incubators could become efficient in producing new products and services in high

population countries. AL-Mubaraki and Busler (2014) agreed with this view; the researcher showcased the incubators in China and how they could commercialise technologies based on local resources. When it comes to university-based incubators, Westhead and Storey (1995) expected to launch local products and services especially when the R&D is directed to address the industry problems.

Concerning the GCC studies, very few scholars addressed the role of incubators in promoting local products and services. In Saudi Arabia, Alsheikh (2009) and Salem (2014) agreed with the idea of having incubators that can support the local economy by producing local products, particularly at university-based incubators. Khorsheed, Al-Fawzan, and Al-Hargan (2014) agreed with this role to be played by incubators that are attached to universities. The researchers highlighted the case of BADIR incubator as a successful case in launching local products in three targeted industries in Saudi Arabia.

As a result, it is widely known that the UAE government is seeking to diversify its economy and adopting innovation strategies. Therefore, it is logic for incubators in the UAE to contribute through producing value-added products and services based on the explicit and implicit support they receive from the local governments. Thus, putting this role into a practical perspective, business incubators need to consider this role as part of their value creation and measure their effectiveness against it.

6.6 Discussion of the Correlation Analysis's Results

The Pearson Correlation Coefficient analysis was conducted in this study for testing the significant relationships between the attributes of internal and external factors with the indicators of incubators' success in the UAE. Also, the correlations analysis

enabled testing the hypotheses related to the internal as well as external factors and the success indices of incubators in the UAE. In Chapter three, Table 13 presents the eight related hypotheses (four internal and four external), while the results of the correlation coefficient analysis are presented in Tables 47-50 in Chapter 5.

In this Section, Table 57 presents a summary of the correlations' results, which revealed that all the correlations were positively correlated either between the attributes of the same scale or between the attributes and the three success indices of incubators in the UAE. However, when analysing the correlation between the attributes of the internal factors with the success indices of incubators, the findings showed that the attribute of "having contracts for incubatees" in the availability of infrastructure factor as well as the attribute of "supporting IP services" in the factor of commercialization condition have weak correlations with the three success indices of the incubators in the UAE.

This weak relation indicates that the success measures of incubators are not affected by having a clear contract that governs the relationship between the incubator and their clients as it can be considered as an operational activity, neither providing IP services as it can be considered as optional services, which could be outsourced. Nevertheless, these two services may enhance the performance of incubated clients at the incubators if they are adequately addressed by the incubators, which may accelerate the process of graduating incubatees (first success index), and therefore, speed up the process of creating start-ups.

As far as external factors are concerned, when analysing the correlation between the attributes of the external factors with the success indices of incubators, the findings have shown that the attributes of "government fund", "private sector fund", "banks

loans", and "R&D funds at universities" in the financial resources factor as well as the attribute of "collaboration with universities" in the market condition factor have weak correlations with the three success indices of the business incubators in the UAE. These findings are justified as the survey respondents (management of incubators and incubated entrepreneurs in the UAE) have indicated the limited availability of those types of fund sources. Therefore, business incubators need to take further attention to diversify fund sources as well as putting more efforts in increasing the collaboration level with universities, which may enhance the three success indices of the incubators in the UAE.

Finally, with regards to the hypotheses results, the findings of correlation analysis revealed that the hypothesis of HI_{CF3} "*The higher level of qualifications and experiences of the management and the technical team at the incubators, the more business incubators will succeed*" was the only hypothesis which was accepted among the eight respective hypotheses. This indicates the critical importance of human resources factor, particularly in terms of their experiences, which may lead to achieving all the defined success indices of business incubators in the UAE.

Several research studies supported the importance of human and financial resources. Lish (2012) and Lee and Osteryoung (2004) highlighted some studies that addressed the relation of human and financial resources and the success of the incubators and their role in incubators' effectiveness, while Laosirihongthong and Mclean (2012) stressed the "talented managers" as one of the most influential factors for the success of incubated businesses, which needs to be considered as the main priority for incubators. On the other hand, Alsheikh (2009) discussed the benefits gained by the incubators when collaborating with the universities in Saudi Arabia. The researcher

stressed utilising the experiences of faculty members at universities, which may eventually support the objectives of university-based incubators.

Table 57: Summary of the Research Hypotheses related to Results Obtained from the Pearson Correlation Coefficient

Internal and External Factors		Business Incubators Success Indices			
		Graduating entrepreneurs from the incubator	**Creating start-ups companies**	**Sustaining incubated entrepreneurial business**	**Decision**
The relation between Internal Factors and Business Incubators Success Indices					
HI_{CF1}	Availability level of incubators' infrastructure.	Correlated Partially	Correlated Partially	Correlated Partially	Partially accepted
HI_{CF2}	Level of networking accessibility of the incubator.	Correlated Partially	**Correlated Totally**	Correlated Partially	Partially accepted
HI_{CF3}	Level of qualifications and experiences of the management and the technical team at the incubators.	**Correlated Totally**	**Correlated Totally**	**Correlated Totally**	**Accepted**
HI_{CF4}	Level of commercialisation conditions of the incubators.	Correlated Partially	Correlated Partially	Correlated Partially	Partially accepted
The relation between External Factors and Business Incubators Success Indices					
HE_{CF5}	Level of government support.	Correlated Partially	Correlated Partially	Correlated Partially	Partially accepted
HE_{CF6}	Availability of financial resources.	Correlated Partially	Correlated Partially	Correlated Partially	Partially accepted
HE_{CF7}	Level of collaboration.	Correlated Partially	Correlated Partially	Correlated Partially	Partially accepted
HE_{CF8}	Level of entrepreneurship culture.	Correlated Partially	**Correlated Totally**	**Correlated Totally**	Partially accepted

6.7 Discussion of the Regression Analysis's Results

The Multiple Regression Model found to be one of the best statistical tools that can test the significant contributions of the internal and external factors to the success of business incubators. Also, conducting the Multiple Regression statistics enabled answering the study hypotheses related to the contributions of the internal and external factors as predictors (independent variables) of incubators' success (dependent variables). Therefore, six hypotheses were proposed related to the contributions of incubators' success in Chapter Three (Table 13), while the results of the Multiple Regression Analysis are presented in Tables 51-56 in Chapter 5.

In this Section, Table 58 presents a summary of the regression results. The table shows that all the multiple regression models were significant, which indicates the contributions of the internal and external factors to the success indices of the business incubators in the UAE. In the following subsections, the effects of the internal and external factors on the three success indices of incubation in the UAE are discussed:

i] *Discussion of the Multiple Regression Results for the Internal and External Factors success in Graduating Entrepreneurs from the Business Incubator***:** Table 51 and Table 54 reported the obtained results from the regression analysis. The findings succeeded to partially accept the hypothesis of $HI_{R1:}$ ("The internal factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator") and the hypothesis of $HE_{R4:}$ ("The external factors contribute positivity to the success of business incubators in terms of graduating entrepreneurs from the incubator"). In addition, the two concerned Tables showed that there are significant statistical relationships between two internal factors (accessibility of networking and the

qualifications and experiences of the human resources) as well as two external factors (collaboration level of the incubators and the entrepreneurship culture) with the success index of "Graduating Entrepreneurs from the Business Incubator". Thus, the findings indicate that the entrepreneurs may graduate successfully from the incubators in the UAE if the incubators managed to recruit qualified and experienced human resources and strengthen their networking accessibility.

These findings can be considered logic as the management team at the incubators are the ones who manage the incubation cycle from entry stage until exiting the incubator, while the networking with expertise, information sources, and customers can be considered as enablers for progressing during the incubation cycle, and eventually graduating from the incubator. As far as external factors, the results showed that the graduation of incubated entrepreneurs could be realised if the entrepreneurship culture in the UAE is enhanced as well as if the collaboration level with universities has been improved. In this regard, several incubators that are attached to universities in the UAE have been identified in this study, which is mainly incubating undergraduate and graduate students. Therefore, the collaboration of incubators with their respective universities are highly needed to enhance the graduation of incubated entrepreneurs from the university-based incubators.

ii] *Discussion of the Multiple Regression Results for the Internal and External Factors success in Creating Start-up Companies*: Table 52 and Table 55 summarised the results of the regression analysis. The findings succeeded to partially accept the hypothesis of $HI_{R2:}$ ("The internal factors contribute

positivity to the success of business incubators in terms of Creating Start-Up Companies") and the hypothesis of $HE_{R5:}$ ("The external factors contribute positivity to the success of business incubators in terms of Creating Start-Up Companies"). Also, the two tables showed that there are significant statistical relationships between two internal factors (accessibility of networking and the qualifications and experiences of the human resources), as well as two external factors (collaboration level of the incubators and the entrepreneurship culture) with the success index of "Creating Start-Up Companies". Thus, the findings indicate that the entrepreneurs may able to create start-ups if the incubators managed to recruit qualified and experienced human resources and strengthen their networking accessibility.

These findings could be considered logic as the management team at the incubators are expected to facilitate the process of creating start-ups, access to funding sources, and targeted customers. As far as external factors, the results showed that the collaboration level might support creating start-up companies, especially when this collaboration will be with the government legislators and SME supporters. With regards to the entrepreneurship culture as a predictor to the success of creating start-ups, it can be assumed that the incubated ventures in the public incubators are expected to be supported by the respective local legislators, which reflects the supportive environment provided for SMEs in general and entrepreneurs in particular.

iii] *Discussion of the Multiple Regression Results for the Internal and External Factors success in Sustaining Incubated Entrepreneurial Business*: Table 53 and Table 56 presented the results of the regression analysis. The findings

succeeded to partially accept the hypotheses of HI_{R3}: ("The internal factors contribute positivity to the success of business incubators in terms of sustaining incubated entrepreneurial business") and the hypothesis of HE_{R6}: ("The external factors contribute positivity to the success of business incubators in terms of sustaining incubated entrepreneurial business"). The two Tables also showed that there are significant statistical relationships between one internal factor (the qualifications and experiences of the human resources) as well as two external factors (collaboration level of the incubators and the entrepreneurship culture) with the success index of "*sustaining incubated entrepreneurial business*".

Thus, the findings indicate that the entrepreneurs will be able to sustain their incubated businesses in the open market if the incubators managed to recruit qualified and experienced human resources. These findings could be considered logic as the management team at the incubators are expected to evaluate the feasibility of incubated businesses effectively before they release them into the open market and, in turn, sustain those businesses away from incubators' support. This feasibility could be in terms of having sufficient funds, sales expected, and the skills of founders. As far as external factors are concerned, the results revealed that the collaborations might support sustaining the incubated businesses if this collaboration made with market developers in the targeted business sectors.

Table 58: Summary of the Research Hypotheses related to Results Obtained from the Multiple Regression Models

H#	Success indices (Dependent Variables)	Model results		Internal and External Factors as contributors to the success of business incubators (Predictors)					
Internal factors		**R^2**	**P**	**Constant**	**F1**	**F2**	**F3**	**F4**	**Decision**
HI_{R1}	Graduating entrepreneurs from the incubator	.508	**0.000****	.837	.704	**.020***	**.002****	.756	Partially accepted
HI_{R2}	Creating start-ups companies	.552	**0.000****	.322	.333	**.005****	**.050***	.577	Partially accepted
HI_{R3}	Sustaining incubated entrepreneurial business	.466	**0.000****	.287	.770	.066	**.001****	.621	Partially accepted
External factors		**R^2**	**P**	**Constant**	**F5**	**F6**	**F7**	**F8**	**Decision**
HE_{R4}	Graduating entrepreneurs from the incubator	.471	**0.000****	.110	.304	.499	**.002****	**.002****	Partially accepted
HE_{R5}	Creating start-ups companies	.522	**0.000****	**.009****	.184	.757	**.005****	**.000****	Partially accepted
HE_{R6}	Sustaining incubated entrepreneurial business	.510	**0.000****	.094	.149	.712	**.036***	**.000****	Partially accepted

** the value is significant at alpha ≤ 0.010

* the value is significant at alpha ≤ 0.050

6.8 Conclusion

To answer the research objectives, this chapter addressed the research questions by discussing the internal and external success factors of business incubation, the measurement of incubators' success, and the roles of incubators in the UAE. The results of analysed secondary and primary data have enabled in determining the success factors of incubators and examining their expected roles within the UAE domain. Also, in order to indicate the level of alignment between answers, the results of the present study have been compared with the findings of other international studies as well as within the GCC region in business incubation field. Moreover, this chapter discussed the correlations between the attributes of each success factor with the success indices of the incubators in the UAE. Finally, the findings (success factors, measurements of success, and the expected roles) have been justified within the UAE context and compared with the findings of related studies in business incubation field.

The previous studies, as well as government reports, have shown that the incubation concept has been recognised by the UAE government as one of the tools that may address the socio-economic challenges of the country. However, previous studies revealed that the incubators need ingredients of success, which could be within the incubators' capacity, while some others are related to the external business environment of a country. In the UAE case, the present study has shown that the networking, commercialisation capabilities, experience of human resources, and the infrastructure of the incubator are critical internal factors for incubators' success.

In terms of the networking factor, the results revealed that the accessibility to funding sources and targeted customers are critical for incubators' success. The commercialisation conditions were another critical for incubators success, particularly

in generating potential entrepreneurial ideas, assessing the feasibility of entrepreneurial products/services, and supporting the creation of start-ups. Also, the study results have shown the critical factor of incubators' human resources, mainly their hands-on experiences in supporting incubated businesses. Finally, the infrastructure of the incubator has also been recognised as a critical success factor through the facilities and value-added services offered to incubated clients.

In terms of the external success factors of business incubators in the UAE, the study results have shown that fund sources, government support, the market conditions, and the entrepreneurship culture are critical external factors for incubations' success. Therefore, in order for business incubators to reach a maturity level, there are still policy gaps that need to be addressed. Also, it is expected from the government to provide more incentives that give incubated businesses some unfair competitive advantages. Moreover, in order to compete globally, the present study has revealed that more funds need to be offered in the market or to be introduced for incubated start-ups such as venture capital funds and R&D funds at universities.

As far as the measurement of business incubations' success, the present study has shown that the creation of start-up businesses, their sustainability in the market, the jobs that are created, and finally the graduation of entrepreneurs are the most important measurement criteria for assessing the incubators' performance. Also, the study findings showed that entrepreneurs are attracted to incubators when they mainly provide value-added services with competitive rates, facilitate establishing start-ups and provide funds for incubated clients. Moreover, the roles of business incubators in the UAE have been discussed and revealed that it serves some strategic objectives such as contributing to the local economies, and in the same time promote entrepreneurial

practices in the country such as nurturing entrepreneurs. Based on the results above, the framework of business incubations' success in the UAE can be updated and discussed in the conclusion and recommendation chapter.

Furthermore, the results of correlation analysis have shown that some of the attributes within the internal and external factors are not highly correlated with the three success indices of the business incubators in the UAE. Therefore, based on the study findings on testing the hypotheses, this research has partially accepted seven hypotheses, while the hypothesis (HI_{CF3}) has been accepted, which is related to the qualifications and experiences of human resources at the incubators. Finally, the results of regression analysis have indicated that the internal and external factors are not contributing to all three success indices of business incubators in the UAE. Therefore, the six hypotheses related to regression analysis have been partially accepted.

Chapter 7: Conclusion and Recommendations

7.1 Introduction

The UAE government showed its commitments to developing the entrepreneurship ecosystem in order to promote entrepreneurial practices in the country. This study aimed to develop a framework for business incubations' success by investigating their critical success factors and identifying their roles that can support the socio-economic plans of the UAE. Therefore, in order to propose such a framework, this research went through the following procedures:

i] Conducted an extensive literature review on the success factors of incubators and their roles in previous international studies and within the GCC region,

ii] Explored the success factors of business incubators and identified their expected roles in the UAE through semi-structured interviews with subject matter experts,

iii] Described the success factors of business incubators as well as their roles using a structured survey method,

iv] Discuss the findings (success factors, roles, and measurements of success), assess the correlations and regression analysis (the factors with the success indicators), and validate the research hypotheses (eight hypotheses).

In the UAE, there are eleven business incubators that are currently operating, and the numbers are expected to grow due to the diversified economic sectors across the country. Thus, developing a framework of business incubation fills a research gap within the incubation studies in the UAE. In addition, it offers a comprehensive guideline for the stakeholders of business incubators, particularly the federal and local governments of the UAE when establishing or operating an incubator. Therefore, it is

critical for the sponsors of incubators to consider the suggested enabling factors in order to successfully achieve their mandates and at the same time, maximize the return of their investment.

The objective of the conclusion and recommendation chapter is to summarise the main results of this thesis. In addition, this chapter will also include the following sections:

i] Section 7.2 summarises the main results based on the four stages of the methodological framework.

ii] Section 7.3 discusses the implications of the results, which will be divided into theoretical and practical implications.

iii] Section 7.4 discusses the contributions to the knowledge, which will be divided into theoretical and practical contributions, in which it could help both the scholars and the professionals in the business incubation field.

iv] Section 7.5 discusses the research limitations in this thesis.

v] Section7.6 presents the conclusion and recommendations of the study based on the study findings.

vi] Section 7.7 suggests some proposed future research that could be investigated, based on the outcomes of this study.

7.2 Summary of Main Results

The main purpose of this thesis is to identify the success factors under which business incubators are expected to be successful in the UAE. In addition, the research aims to determine a set of roles in order to effectively support the socio-economic development plans, with a particular focus on promoting entrepreneurial practices in the country. This research has been able to realize this aim. In addition, the proposed framework of business incubation's success has supported partially all the proposed research

hypotheses. The study findings are divided into five groups, which will be summarized in the following sections:

7.2.1 Business Incubation Studies in the GCC

An extensive desk review has been conducted to collect all the literature discussed business incubation in the GCC region. As result, 28 studies have been found, which was developed by scholars from the GCC countries and abroad (see Appendix II). The GCC studies discussed many dimensions but most importantly, it focused on the evolution of business incubators in the GCC region. However, few GCC studies have researched the conditions affecting incubators' performance, measuring their success, and their roles in their countries.

With regards to the enabling factors of incubations' success, the 28 incubation studies covered the eight enabling factors, which were proposed within the framework of business incubations' success at the present study. As such, the findings of incubation studies in the GCC have considered the following internal enabling factors that may have an impact on the success of incubators: i) the capabilities operating the incubators and their commercialisation programmes, ii) the Infrastructure of the incubator, and iii) the networking capabilities of the incubator. While the GCC studies have considered the following external enabling factors that may have an impact on the success of incubators: i) the Availability of financial resources for incubated clients, ii) the entrepreneurship culture, and iii) the Market condition and government support.

In terms of how the GCC studies perceived incubations' success, the findings have considered the following criteria (as summarised in Table 6):

i] The number of entrepreneurs that graduated from the incubators.

ii] The number of start-ups created out of business incubators.

iii] The sustainability of new joining start-ups in the open market.

Finally, with regards to the roles of the incubators in the GCC countries, the scholars suggested a variety of roles in response to several socio-economic challenges appeared in the last 15 years. Therefore, their findings have considerably recognised six dimensions of roles (see Table 11) as followings starting from the most important:

i] Building the capabilities of a new generation of entrepreneurs.

ii] The contribution to local economies and creation of jobs.

iii] The creations of new local products and services.

iv] The development of entrepreneurship culture.

v] The support of national innovation and economic plans.

7.2.2 Overview of Business Incubators in the UAE

In the UAE domain, very few studies researched business incubation practices, therefore, this study had to address all the business incubation studies conducted in the GCC region (see Appendix II) in terms of their evolution, success factors, roles, and success measures. With regards to the success factors, the respective studies have indicated several influencing factors that may affect incubations' success, particularly from the study of Elmansori (2014), which identified the following success factors:

i] The funding of new businesses.

ii] The governance of the incubator.

iii] The purpose of establishing and its targeted industries.

iv] The services offered to incubated clients.

v] The support of the public and private sector.

In terms of the perception of success, Elmansori (2014) believed that the incubators in the UAE are successful when they are able to:

i] Access to funds.

ii] Continue to improve.

iii] Create success stories.

iv] Have rigorous selection criteria.

v] Have support from stakeholders.

vi] Recruit competent incubation manager.

With regards to the roles of business incubators in the UAE, the studies of Byat and Sultan (2014) and Elmansori (2014) have suggested several roles with a particular focus on promoting entrepreneurial practices such as nurturing entrepreneurs, creating jobs, and establishing start-ups in the targeted fields. In addition, the two studies have shown that the incubators in the UAE are severing mainly the seven targeted sectors and offering the following value-added services:

i] Generate and assess ideas for developing feasibility studies.

ii] Provide different types of training (e.g., mentoring, technical, soft skills).

iii] Provide different workspaces with shared administrative services.

iv] Provide management shared services (e.g., legal, marketing, HR).

v] Conduct networking events for creating start-ups with sufficient support.

As far as the characteristics of the eleven business incubators in the UAE, the following findings have been witnessed:

i] More than half of the incubators have graduated more than 15 entrepreneurs.

ii] 66.7% of current incubators have managed to create more than 15 start-ups.

iii] More than half of the incubators are currently incubating more than 15 entrepreneurs.

iv] Community members were considered the dominant category that was incubated in the current business incubators, followed by undergraduates.

v] The clients of the UAE incubators are hosting more males' entrepreneurs (65%), while the ages of incubated entrepreneurs ranged from 19 to 54 years with particular focus on 27 years, which indicates few years of experience after graduation from a university.

7.2.3 The Internal Enabling Factors that Affect Incubators' Success

The present study revealed several critical internal factors that have influences on the success of business incubators in the UAE. Based on the findings of the interviews and survey questionnaire conducted with the related stakeholders, this research identified the following internal factors (starting from the most important):

i] The commercialization capability of the incubators.

ii] The human resources' competencies of the incubators.

iii] The infrastructure of the incubators.

iv] The networking accessibility of the incubators.

The findings of the present study have shown specific areas of each four critical internal factor that have an influence on incubators' success in the UAE as followings:

i] *Networking of the Business Incubator*- The accessibility to funding sources, customers, information sources, and expertise are critical networking activities for business incubators.

ii] *Commercialisation Conditions of the Business Incubator*- The following commercialization aspects are important for business incubators to be considered:

- Assessing and testing the feasibility of potential products and services.
- Generating and assessing entrepreneurial ideas,
- Supporting in the creation of start-ups.
- Supporting intellectual property protection services.

iii] *Human resources of the Business Incubator*- The experiences of management and technical team at the business incubators that are able to design and deliver programs from the stage of developing entrepreneurial ideas until commercializing incubated products and services in the open market are highly critical to incubators' success.

iv] *The infrastructure of the Business Incubator*- The business incubators need to have a variety of space facilities and supported with value-added services for its incubated clients as well as having policy and procedures that govern the entry and exit of their clients.

7.2.4 The External Enabling Factors that Affect Incubators' Success

The present study identified several critical external factors may affect the success of business incubators in the UAE. Based on the results of the interviews and survey questionnaire conducted with the related stakeholders, this research showed that the success of business incubators in the UAE are affected by the following external factors (starting from the most important):

i] The entrepreneurship culture in the UAE.

ii] The fund resources available for incubated entrepreneurs.

iii] The government support offered to business incubators.

iv] The market condition in the UAE.

The findings of the present study have shown specific dimensions of each four external factor that have an impact on the incubators' success in the UAE as followings:

i] *The Government Supported Offered to Business Incubators*- Having supportive legislation and incentives in the UAE that gives set of advantages for incubated entrepreneurs are critical for incubators' success.

ii] *The Fund Resources Available for Incubated Entrepreneurs*- Increasing and diversifying fund sources, especially the venture capital fund, bank loans, and R&D funds at local universities are an important aspect for the success of the incubators in the UAE**.**

iii] *The Market Conditions in the UAE*- Systemised collaboration between the incubators and local universities, related government entities, and respective industry regulators in the UAE are influencing factor for the success of the incubators.

iv] *The Entrepreneurship Culture in the UAE*- The entrepreneurship culture in the UAE has an influence on the success of the incubators in the UAE, particularly in the level of risk-taking, identifying novel ideas, and experimenting them at the business incubators.

7.2.5 How to Measure Business Incubations' Success in the UAE?

The findings of the present study have shown that the success of business incubators in the UAE should be measured based on the following criteria starting from the most important measure (as detailed in Table 20) as: i) The creation of start-up companies, ii) the graduation of entrepreneurs from business incubation cycle, iii) The number of

jobs created by the incubated businesses, and iv) The sustainability of incubated businesses in the Market.

7.2.6 Reasons for Entrepreneurs to Join an Incubator in the UAE

The study findings have shown that the community of entrepreneurs in the UAE would join an incubator based on the following incentives (starting from the most important):

i] A competitive market rate offered by incubator for workstations.

ii] The facilities, services, and networking offered by the incubator.

iii] The fund sources offered by the incubator.

iv] The support offered by the incubator to create a start-up company.

7.2.7 The Roles of Business Incubators in UAE

The research findings showed that the business incubators in the UAE are expected to play the following strategic roles (starting from the most important role):

i] The contribution to the local government economies.

ii] The development of entrepreneurship culture.

iii] The support of a national innovation strategy.

In addition, the findings have also revealed that business incubators are expected to promote the entrepreneurial practices in the UAE through the following roles (starting from the most important role): i) commercializing new incubated products/services, ii) creating jobs, and iii) nurturing entrepreneurs.

7.2.8 The Research Hypotheses

Based on the results of correlation analysis, the present study has totally accepted the hypothesis of “The higher level of qualifications and experiences of the management and the technical team at the incubators, the more business incubators will succeed”,

while the remaining seven correlation hypotheses have been partially accepted. In addition, the results of regression analysis have shown that the internal and external factors are not fully contributing to each success indices of business incubators in the UAE, therefore, the present study has partially accepted all the six related hypotheses.

7.3 Implications of Results

7.3.1 Theoretical Implications

The present study aimed to develop a framework for incubation's success in the UAE using the resource-based theory approach while considering the UAE conditions. In this regard, it is worth mentioning that Alsheikh (2009) developed a set of conditions for incubations' success that are suitable for Saudi Arabia, while Elmansori (2014) proposed a list of elements for business incubators to succeed in the UAE. However, those two previous studies have recommended some conditions at the time that the majority of current business incubators in the UAE or even in the GCC did not exist.

Therefore, the proposed framework of business incubations' success in the current study has considered certain new dimensions that were not researched by previous studies such as the market conditions and commercialization conditions. As such, the proposed framework of incubations' success at the present study may encourage the related scholars to develop a theory of successful business incubators that are specific to the GCC region. In addition, the findings of the present study have identified eight critical success factors, with several associated elements that may contribute to the success of business incubators in the UAE.

Therefore, each success factor may worth researching within the GCC region in general, and in the UAE in specific. Such studies will help in developing new

knowledge for each factor and gives an opportunity for understanding their associated elements as well as their nature of existence. For instance, several international studies have indicated the importance of government support as one of the main influencing factors on the success of the incubators. However, government support has different dimensions that can be offered to support the incubators, while keeping in mind that each type of support may have a different owner that represent different government entities.

Finally, this thesis may encourage scholars to consider research on building a robust entrepreneurship ecosystem in the UAE. Several studies have covered different dimensions of entrepreneurship in the UAE. However, more studies are required to cover all the dimensions that contribute to entrepreneurship ecosystem. Therefore, this research may support such studies particularly through the external factors of incubations' success. In this regard, and based on the findings of the present study, future researchers may investigate further in the areas that contribute to the entrepreneurship ecosystem in the country.

7.3.2 Practical Implications

Business incubators mainly exist in order to play the role of catalyst in accelerating entrepreneurial ventures and become independent in the open market. In the UAE case, business incubation has been considered as one of the enablers for socio-economic development plans. As such, providing suitable conditions for existed and future incubators is needed in order to play effective roles in the targeted sectors. The findings of the present study have three major areas of practical implications, which will be discussed in the following points:

7.3.2.1 Implications for Policymakers

The traditional approach of funding individuals through respective government fund entities, aiming to increase the number of SMEs in the market seems to be not enough in the GCC region and the UAE in particular. The government in the UAE has invested in building incubators in order to attract local and global start-ups. As a result, this study introduces business incubators along with associated critical success factors to become effective in helping entrepreneurs to pursue their entrepreneurial ventures not only to enter the market but also to sustain and contribute to the local economies.

The governance of business incubators; therefore, becomes crucial for incubators' success. This includes respective policies that organize the activity of business incubators at each emirate, the exclusive incentives offered for incubated entrepreneurs, the relationship of the incubators with its stakeholders, and services offered at the incubators in the UAE. On the other side, the desire of entrepreneurs to create their businesses in the GCC region during their study have encouraged universities to launch incubators in their campus. However, this move requires having the infrastructure, strategy, and legislation to achieve such goals.

The university-based incubators (particularly the public universities that are supported by the government) might consider the framework of business incubations' success as a guideline for two things:

i] First, to understand how business incubators should be operated effectively by addressing the critical success factors as well as playing certain roles that are expected by the government.

ii] Second, policymakers at universities may shift some of their fund allocated for R&D at universities towards applied research that could be commercialised through university-based incubators.

By doing so, Universities may able to attract different types of funds, which ultimately will support the students in pursuing entrepreneurial career opportunities, contribute to the local economies, and diversify the income sources for the universities.

7.3.2.2 Implications for Managing Business Incubators

The proposed framework of incubations' success may help the management of the incubators to consider all the internal success factors and their associated elements in order to become efficient in managing the incubators' resources, and therefore, increase the chance of their success. For instance, the networking activity of the incubator can't be limited to high-level events to connect with potential investors, but it should be tailored to networking events that are dedicated to targets customers at specific industries, investors for specific stages, information sources for desired knowledge, and industry regulators for accessing the respective industries and customers.

Another practical implication out of the present study is to align the success measures when assessing the performance of the business incubators, particularly the public incubators in order to develop an aligned report across the country. In this regard, previous studies did not agree on a specific set of criteria to measure the success of incubators. Also, the local sponsors of the incubators in the UAE did not have a benchmark to extract the best measurement method that can be adopted. So, the

business incubators sponsors need to see clear indicators for their investment in incubators' business.

As such, this study has suggested four success measurements to evaluate the performance of the incubators in the UAE that is based on tangible outcomes. These success measurements are indicated by the number of:

i] Graduated entrepreneurs from the business incubation.

ii] Jobs being created by the incubated businesses.

iii] Registered start-up companies created from the incubator.

iv] Sustained start-ups in the market that graduated from the incubator.

Finally, the present study has also shown that managing incubators are not like managing departments at a government entity. Therefore, in order to successfully manage and operate the programs and activities of the incubators, their sponsors (particularly the public sponsors) in the UAE need to recruit experienced candidates for managing the incubators that went through entrepreneurial ventures and have a deep understanding of being an incubated entrepreneur.

7.3.2.3 Implications for the Community of Entrepreneurs

The findings of the study have shown that the community of entrepreneurs in the UAE will select an incubator based on the following criteria (starting from the most important):

i] The fund sources offered by the incubator.

ii] Competitive market rate offered by incubator for workstations/office spaces.

iii] The facilities, services, and networking offered by the incubator.

iv] The support is given by the incubator to create a start-up company.

Thus, in addition to the overview on all the current businesses incubators that are available in the UAE, the above criteria will help the local as well as global entrepreneurs to choose among those incubators.

7.4 Contribution to the Knowledge

7.4.1 Theoretical Contributions

The present study has provided an updated overview of business incubation within the GCC region by covering 28 related studies in terms of evolution, success factors, a method of categorizing the success factors, measuring the success of business incubation, and their roles in the GCC countries.

In the UAE context, the present study covered all active business incubators operating in the UAE, which has not been researched previously, aiming to generalize the findings. Therefore, this research is quite unique as it is considered a comprehensive study that offered insights related to the critical internal and external success factors of business incubators, methods of measuring their success, the relationships between the success factors of incubators with the indicators of incubators' success, and their expected roles in the UAE.

In addition, the outcomes of this research are expected to offer valuable and updated knowledge in entrepreneurship studies from the business incubations' dimension within the UAE domain. Moreover, due to the limited literatures on business incubation in the UAE, the specialized nature of study (success factors, success measures, and the roles of business incubators in the UAE), and the small size of the study population (number of active business incubators in the UAE), the present study had to adopt mix methodologies in order to address the research objectives. This is

another contribution, in which future related studies may benchmark and therefore, design the research approach based on their study objectives.

Furthermore, the results of the study have identified specific roles that business incubators may contribute at a macro as well as at micro levels. As such, those roles could be a base for further research in order to assess the current and the expected roles of business incubators in the UAE. Finally, this study has identified several measures of success that business incubators can be assessed based on experts' opinions. Therefore, this could be an opportunity for researchers to investigate the success level of all business incubators in the UAE based on the four identified criteria.

7.4.2 Practical Contributions

The findings of the present study have identified critical success factors, which constitutes the framework of business incubations' success in the UAE. This is likely going to contribute to the knowledge of business incubations' stakeholders in the UAE by providing them with a practical guideline that is specific to the UAE domain to be considered for enhancing the chance of incubators' success. In this regard, the sponsors of the business incubators will realise that operating incubators is much more than providing workspaces, facilities, and some services. As a result, the stakeholders may take better decisions that enhance the effectiveness of the incubators.

Another practical contribution would be raising the awareness of the potential benefits of the university-based incubators. In this regard, the local governments that are sponsoring the local universities, as well as the management of universities themselves, may gain practical knowledge concerning the potential of

commercialising applied research through their incubators, particularly in the technology fields.

In addition, based on the study findings, the management of the incubators needs to design and deliver specific standard programs that are related to the followings:

i] Assessing the feasibility of potential products and services that are incubated.

ii] Facilitating the creation of start-ups and sustaining them in the open market.

iii] Nurturing incubated business concepts to be developed.

iv] Sourcing and generating entrepreneurial ideas to be incubated.

Moreover, when applying the proposed measures of success based on the study findings, the sponsors of the business incubators in the UAE, mainly the public ones, will be able to assess the level of incubators' success in terms of numbers of jobs created, start-ups established, and entrepreneurs graduated out of each business incubators. Finally, based on the expected roles identified in the present study, it is expected from the respective government entities related to the local economies at each Emirate in the UAE to consider the economic contributions of incubated start-ups, which could be supported for sustaining their growth in the local and global market.

7.5 Research Limitations

Similar to any research study, this thesis has several limitations. One of the study limitations was related to the limitations of finding secondary and primary data within the UAE domain. With regards to the secondary data, there was a scarcity of studies that researched business incubation in the UAE, while collecting primary data was limited to only eleven business incubators due to the recent practices of business incubators in the UAE. Therefore, the targeted population was small and not highly

incentivised to participate in the survey, which caused concern in the representation of the sample in the two categories (management of the incubators and the incubated entrepreneurs) that make their feedback valid to generalise the findings.

Also, the study faced challenges in approaching the incubated entrepreneurs that graduated from the incubators in the UAE. This category was either not approachable or not interested in participating in the survey. Moreover, some of the incubated entrepreneurs have not experienced the full cycle of incubation. Thus, their level of feedback was limited as they have not experienced the full cycle of incubation stages.

Furthermore, the study did not consider the operational factors such as the amount of fund received and the financial performance of the incubators as well as the types of incubated businesses that serve specific industries. As such, the analysis of the study results has treated all the identified business incubators equally without categorising them based on their type. Finally, the study has not considered business accelerators that are operating in the UAE, which may have some similarities with business incubators in terms of their objectives and services offered to entrepreneurs and start-ups in general.

7.6 Conclusion and Recommendations

The Federal Government of the UAE has encouraged embracing the entrepreneurial activities to be implemented within the targeted sectors as declared in the national innovation strategy. Also, the strategy has defined business incubators as one of the enabling tools for promoting entrepreneurship practices in the country. In response to that, this research provided a framework of business incubation's success in order to assist in realising the national innovation strategy. This framework contains a set of

factors that interact as well as influence each other and owned by different stakeholders in order to provide a business environment for incubators to achieve their mandate. Therefore, based on the practical validation exercise of this research, a conceptual framework of business incubations' success is presented in Figure 18.

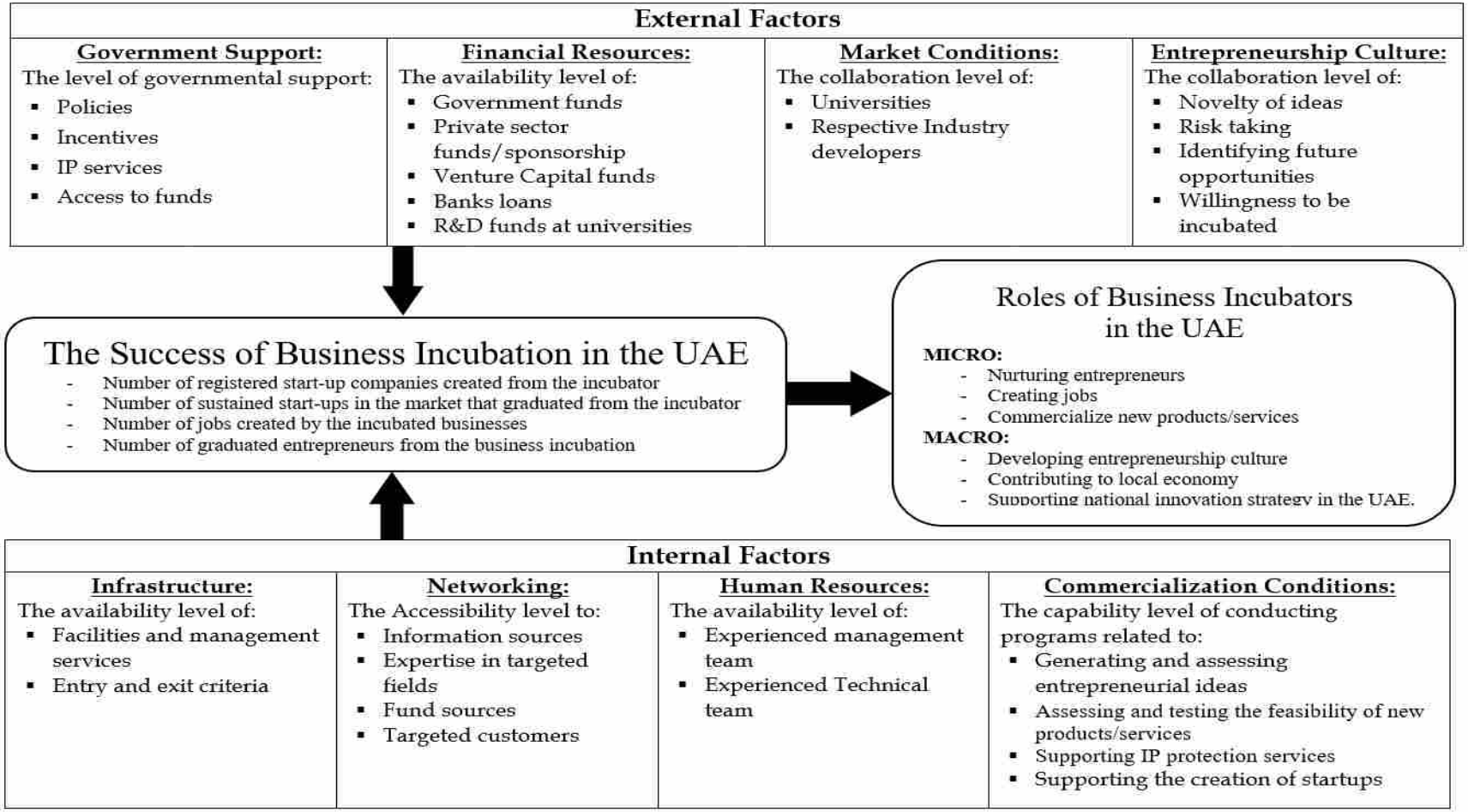

Figure 18: Conceptual framework of business incubations' success in the UAE

The updated framework shows that some of the constructs within the external and internal success factors have been removed, while others have been added based on the study findings. As such, this framework would be a roadmap for current and future business incubators in the UAE to be considered toward achieving their mandates. Some of the constructs within the factors are considered tangible actions that need to be realised, while others need to be embedded within the experiences and practices of the incubators.

Based on the overall study findings, the present study proposes the following research recommendations:

i] Despite the country's direction toward promoting entrepreneurship practices, the results of this study have shown the need for more government support and involvement to enhance the entrepreneurship ecosystem in the UAE. Therefore, the study findings have shown that there are still gaps in policies and incentives that are affecting the success of business incubators in the UAE. Therefore, the study recommends having a comprehensive bylaw across the local emirates in the UAE that effectively supports different types of incubators and the incubated businesses in order to attract more entrepreneurs as well as investors to the country. Such a bylaw should consider accommodating critical issues that concern the incubated entrepreneurs such as working visa, issuing licenses, and ownership of their business under the business incubation platform. For instance, the proposed trade license should allow incubated start-ups to test the market, meet the customers, access to funds, outreach suppliers, while they are at early stage of their business model and most importantly, not related to renting office spaces. Another critical regulation that needs to be

addressed is the ease of issuing visas for entrepreneurs and their limitations in the mainland comparing to what is being offered within the free zones in the UAE in order to help to attract global entrepreneurs at the setup phase. On another hand, the bylaw should open the activity of business incubators to potential investors in order to encourage attracting entrepreneurs in the region to be incubated within the UAE and benefit from the economic environment of the country. However, in order for those conducive regulations to be effective, the respective departments at public entities need to be educated about the nature of business incubators and their incubated businesses.

ii] The present study has revealed some challenges in sourcing entrepreneurial and innovative ideas by the business incubators in the UAE. Therefore, is it recommended to design and deliver entrepreneurial programs as extra curriculum activities at early stages of education to enhance the entrepreneurship culture among the young generations in the UAE? Such programs will increase the awareness of the new generation and enable them to consider proposing novel ideas, experimenting with entrepreneurial ideas, and therefore, seriously consider entrepreneurship as a future career.

iii] The present study found that the collaboration between the universities and the business incubators need to be enhanced. Thus, as per the direction of the national innovation strategy, the study recommends developing a systemized mechanism for supporting entrepreneurial ventures through incubators that are based in universities. Such a mechanism should have supportive policies (such as teaching loads and patents' rights), simplified procedures (such as the method of spending funds), and incentives (such as allocating funds for

research projects that are commercially viable for solving specific challenges faced by different industries).

iv] It is widely agreed that one of the common factors for incubators' success is the availability of fund for incubated businesses. In the UAE case, the local governments have allocated some sufficient funds through their SMEs development entities, which can be utilised by the UAE nationals. Also, the present study has shown for the need of increasing and diversifying the fund options. However, there are other entrepreneurs with potential businesses from different nationalities that have been incubated, which requires funds other than early stage or seed funding. Therefore, the study recommends having partnerships between the SME development entities and entities in the private sector at each targeted industry in order to allocate specialised funds for incubated businesses. In this regard, given the market size of the UAE, those specialised funds should stimulate promising and scalable global start-ups to be incubated in the UAE, particularly in STEM fields, which may create jobs, and bring further investments to the country. On another hand, the government needs to encourage the local banks to offer loans for incubated business by minimising the administration constraints and streamlining the criteria of financing.

v] The study findings have shown the importance of having tangible facilities as well as management services at the incubators. Therefore, the incubators need to have a comprehensive governance guide that manages the incubators effectively, which includes the followings elements:

- Criteria and procedures for establishing start-ups,

- Criteria for selecting/accepting concepts/ideas/projects.
- Funding mechanism and guidelines for spending,
- Guidelines for patent registration, procedures, and ownership,
- Marketing/selling of IP rights.
- Progress evaluation mechanism and graduation criteria.

vi] The study findings have shown the importance of incubators' networking, particularly with potential customers. Also, the results of the study revealed that it is critical for incubators to collaborate with respective industry developers. Therefore, the study recommends having close ties between business incubators with the government regulators in the targeted industries in the UAE. Such collaboration enables determining the areas of collaboration and allocates efficient mechanisms for accessing those targeted sectors and working with incubated businesses, which may increase the accessibility of start-ups and address the actual challenges in those sectors through innovative entrepreneurial solutions. On the other hand, it is expected from the industry regulators to streamline the accessibility of incubated start-ups into their sectors and minimise the cost of their entrance and setup.

vii] The findings of the present study have revealed the critical roles of human resources that are managing the business incubators and providing technical support for incubated businesses. Therefore, this study recommends updating the criteria for recruiting candidates at the incubators. The criteria should give a higher value for experienced candidates that went through actual entrepreneurial ventures, which enable them to gain hands-on experiences and skills, and preferably at an incubator.

viii] The study findings have shown that the business incubators (particularly the public incubators) are expected to play several strategic roles as well as other roles related to promoting entrepreneurial practices that serve socio-economic plans in the UAE. Therefore, in order to realise such demanding expectations, the incubators need to be self-sustained away from annual government budget and supported by governance model. As such, the study recommends for public business incubators to diversify its sources of income through several potential opportunities such as:

- Having equity in some potential start-ups and incubated businesses.
- Providing consultations for supporting SMEs.
- Training entrepreneurs.

7.7 Future Research

This thesis has provided a foundation for building a successful model of effective business incubation in the UAE. As a result, it gives the possibility to offer a range of important future research in the incubation studies for interested scholars to consider. In this regard, each critical success factor in the present study may turn into future independent research by identifying its sources, the nature of its influence, and the consequences of its impact. For instance, due to the influence of government support on the success of incubators based on the current study findings, it would be valuable for future research to tackle all types of government support, which may have an impact on the incubators' success. Also, those future independent researches may also play the role of validating the findings of the present study. Moreover, future research may also address each role as well as defined measurements found in the present research.

On the other hand, it would be interesting for future research to conduct case studies on specific industries in the UAE that are served by the current incubators. Such a case study may develop valuable insights about the nature of the incubated businesses, their challenges, their achievements, and the role of the respective regulator at those industries. Such a study will give valuable insights to other incubators in different sectors to gain knowledge and share relevant experiences.

Another interesting future study that could be researched in the UAE domain is to conduct research on university-based incubators; their challenges and prospects. Several international studies (Lee & Osteryoung, 2004; Sithole & Rugimbana 2014) have indicated the potential of commercialised technologies or applied research through university-based incubators. However, those studies have indicated several influencing factors that may support turning those applied research projects into spin-off commercial businesses. Therefore, it would be ideal for researching incubators that are attached to universities such as the UAE University incubator and Khalifa Innovation Centre to develop knowledge about their challenges, success factors, and achievements. The study may also cover the legislation that governs the relationship of researchers, as well as students at those universities concerning their participation in the programs of the incubators, which was highlighted by some of the interviewees in the present study.

An important success factor that was found in this research is the sources of fund available for incubated businesses. On the other hand, a considerable number of interviewees in the present study have indicated the importance of introducing venture capital funds to the business incubators in the UAE. Therefore, it would be beneficial to research the type of funds received by the incubated start-ups at different incubation

stages and its relation to their success and sustainability in the market. It is expected that the results will give important indications on the most active funds offered and at different stages for incubated start-ups in the UAE.

Finally, several public and private entities have launched some specialised acceleration programs in the UAE. Those programmes have emerged recently as a fast-track version of a business incubator, aiming to create feasible start-ups in specific industries. Therefore, future research in the UAE may conduct a study on all accelerator programs and compare their critical success factors and outcomes with the current business incubators in the country in order to assess their efficiency and effectiveness.

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Appendices

Appendix I: Definitions of Related Terms

1	**Business Incubator**	An economic development platform designed for entrepreneurial projects that provide value added and integrated facilities, resources, and services in order to nurture entrepreneurs and commercialize their entrepreneurial projects and sustain their growth under one umbrella.
2	**Government Support**	Building supportive policies that protects entrepreneurs, reward them with encouraging incentives, provide them with intellectual property protection services, and facilitate fund sources for them while they are under business incubation platform.
3	**Entrepreneur**	An individual who is primarily have a potential idea, responsible for gathering the necessary resources to turn it into a business, and taking on financial risks in the hope of making profit.
4	**Start-up**	An entrepreneurial venture that are newly established a business and designed to scale very quickly.
5	**Financial Resources**	The availability of financial resources in the UAE for business incubators for their incubated clients. The source of fund may include government grants, private sector funds/sponsorships, bank loans, venture capital funds, and R&D budgets at universities.
6	**Market Condition**	The level of systemized collaboration between respective: government entities, universities, industry developers, and customers in the UAE.
7	**Entrepreneurship Culture**	The capacity of existing entrepreneurs to generate and develop novel ideas, risk taking, identifying future opportunities, and their willingness to be incubated within the UAE context.
8	**Infrastructure**	The availability level of having entry & exit criteria, incubated clients' contract, progress criteria, and providing management services to incubated entrepreneurs.
9	**Networking**	The accessibility level of an incubator to information sources, expertise in targeted fields, fund sources, and targeted customers.
10	**Human Resources**	The availability level of qualified and experienced human resource personnel at the business incubator that manages the entrepreneurial journey from idea generation to commercialized products and services.
11	**Commercialization Condition**	The capability level of business incubator to support the entrepreneurial ventures to generate ideas, test concepts, assess feasibility of products/services, support protecting IPs, testing product/services, and create start-ups using effective and efficient mechanism.

Appendix II: Business Incubation Studies Addressed the Case of UAE

#	The Scholar	Business Incubation's Studies in the GCC Region
1	Elmansori (2015)	Business incubators as a tool for the development and growth of start-up companies in the Arab world.
2	Hedner, Almubaraki, Busler, & Abouzeedan (2010)	Business and Technology Incubators and their Role in the Nordic Countries in Comparison to the GCC countries: An Analysis of Current Affairs.
3	Al-Mubaraki & Busler (2010)	Business incubators: Findings from a worldwide survey, and guidance for the GCC states.
4	Elmansori (2014)	Business incubators in the Arab World: Comparative study of Jordan and UAE business incubators.
5	Madichie (2010)	Business incubation in the UAE: prospects for enterprise development.
6	Hamad & Arthur (2012)	Entrepreneurship in SMEs Through Business Incubators in the Arab World (Case Study of UAE).
7	Elmansori (2014)	Fostering innovation and entrepreneurship in Small and Medium Enterprises (SMEs) through business incubators in the Arab world
8	Al-Mubaraki & Schröl (2011)	Measuring the effectiveness of business incubators: four dimensions approach from a gulf cooperation council perspective.
9	Byat & Sultan (2014)	The United Arab Emirates: Fostering a Unique Innovation Ecosystem for a Knowledge-Based Economy.

Appendix III: Summary of Business Incubation Studies in the GCC

#	The Scholar(s)	Research Title
1	Hanadi & Busler (2012)	A Comparative Study of Incubators' Landscapes in Europe and the Middle East. European Journal of Business and Management
2	T EL-Midany & Shalaby (2009)	A Proposed Technology Incubator Model for the MENA Countries
3	Khorsheed, Alhargan & Qasim (2012)	A Three-Tier service model for national ICT incubator in Saudi Arabia
4	Al-Mubaraki & Busler (2014)	Beyond incubators mechanisms: Innovation, economic
5	Elmansori (2015)	Business incubators as a tool for the development and growth of start-up companies in the Arab world
6	Hedner, Almubaraki, Busler & Abouzeedan, (2010)	Business and Technology Incubators and their Role in the Nordic Countries in Comparison to the GCC countries: An Analysis of Current Affairs
7	Al-Mubaraki, & Busler (2010)	Business incubators: Findings from a worldwide survey, and guidance for the GCC states
8	Elmansori (2014)	Business incubators in the Arab World: Comparative study of Jordan and UAE business incubators
9	Alsheikh (2009)	Business incubation and economic development. A study in Saudi Arabia
10	Madichie (2010)	Business incubation in the UAE: prospects for enterprise development
11	Al Mubaraki (2011)	Critical activity of successful business incubation
12	Shalaby (2007)	Enhancing incubator performance towards sustainability
13	Hamad & Arthur (2012)	Entrepreneurship in SMEs through business incubators in the Arab World (case study of UAE)
14	Elmansori (2014).	Fostering innovation and entrepreneurship in Small and Medium Enterprises (SMEs) through business incubators in the Arab world

#	The Scholar(s)	Research Title
15	Khorsheed & Al-Fawzan (2014)	Fostering university–industry collaboration in Saudi Arabia through technology innovation centres
16	Al-Mubaraki & Wong (2011)	How valuable are business incubators? A case illustration of their performance indicators
17	AL-Mubaraki & Busler (2014)	Incubator successes: Lessons learned from successful incubators towards the twenty-first century
18	Al-Mubaraki & Busler (2012)	Innovation, Entrepreneurship and Technology Commercialization in Developing Countries: A GCC Perspective in an International Context
19	Al-Mubaraki & Schröl (2011)	Measuring the effectiveness of business incubators: a four dimensions approach from a gulf cooperation council perspective
20	Khorsheed, Al-Fawzan & Al-Hargan (2014)	Promoting techno-entrepreneurship through incubation: An overview at BADIR program for technology incubators
21	Al-Mubaraki, Al-Karaghouli, & Busler (2010, April)	The creation of business incubators in supporting economic developments
22	Al Mubaraki & Busler (2011)	The development of entrepreneurial companies through business incubator programs
23	Al-Mubaraki & Busler (2015)	The importance of business incubation in developing countries: Case study approach
24	Al-Mubaraki, Busler & Al-Ajmei. (2013)	The key successes of incubators in developed countries: Comparative study
25	Salem (2014)	The role of business incubators in the economic development of Saudi Arabia
26	Byat & Sultan (2014)	The United Arab Emirates: Fostering a Unique Innovation Ecosystem for a Knowledge-Based Economy
27	Alshumaimri, Aldridge & Audretsch (2010)	The university technology transfer revolution in Saudi Arabia
28	Al-Mubaraki & Busler (2013)	The effect of business incubation in developing countries

Appendix IV: Interview Questions

Dear Participant,

My name is Fareed Al Amiri; I am a postgraduate student in the Doctorate of Business Administration (DBA) Program in the College of Business and Economics at the United Arab Emirates University. Currently, I am conducting research that aims to discover the enabling factors under which business incubators are expected to be successful in the UAE. In addition, the research seeks to find out the roles of business incubators in the UAE.

Interview Protocol,

Thanks for accepting to be part of this interview within this research. Your participation in this interview is voluntary with right to withdraw at any time. In addition, there are no anticipated risks in participating in this interview meeting, and the collected information through this interview would be treated confidentially.

Being part of this interview, your feedback is highly valuable for successful outcome of this research study. The interview should take approximately thirty-five minutes. Kindly be informed that I may pause the interview for the sake of clarification and efficiency purposes.

Voice Recording

I politely request your permission to record the interview for accuracy and follow on notes.

Fareed Al Amiri
DBA Program, UAE University,
Email: 920215022@uaeu.ac.ae
Mobile: 0506577599

Part One: Interviewee Details:

1. What is your highest qualification?
2. Can you tell me more about your experience with business incubators?

Part Two: Business Incubation Success in the UAE:

3. How do you define business incubators from your own perspective?
4. How do you define business incubators' success from your own experience?
5. What are the key success factors for business incubators in the UAE (such as but not limited to government support, fund, collaboration, networking, HR, commercialization, infrastructure, and culture)?
6. What are the key barriers of business incubators' success in the UAE?
7. What are the key measures of business incubators' success in the UAE?

Part Three: The Roles of Business Incubators in the UAE:

8. What benefits can business incubators provide for the UAE?
9. What benefits can business incubators provide for their incubated entrepreneurs?

Any further clarifications or comment

Appendix V: Survey Questionnaire

Dear Participant,

My name is **Fareed Al Amiri**, I am a postgraduate student in the Doctorate of Business Administration (DBA) Program in the College of Business and Economics at the United Arab Emirates University. Currently, I am conducting research that aims to discover the enabling factors under which business incubators are expected to be successful in the UAE. In addition, the research seeks to find out the roles of business incubators in promoting and supporting entrepreneurship practices in the UAE.

Your participation in this questionnaire is voluntary with rights to withdraw at any time. In addition, there are no anticipated risks in participating in this survey, and the collected information would be treated confidentially.

Being part of the business incubation community, your feedback is highly valuable for successful outcome of this research study. The questionnaire will take around 10 minutes to complete.

Thank you in advance for your kind interest, valuable time and participation in this questionnaire. If you have any question, please refer to the definitions at the end of the survey or you may ask me directly.

Fareed Al Amiri

DBA Program, UAE University, December 2017

Email: 920215022@uaeu.ac.ae Mobile: 0506577599

Part One: Business Incubator Characteristics:

	Applicable for	
	BI	**IE**
Q1. Participant type: ☐ 1. Business Incubator (**BI**) ☐ 2. Incubated Entrepreneur (**IE**)	Yes	Yes
Q2. In which year was your business incubator established? (…….)	Yes	No
Q3. Your position *(tick one only)* ☐ 1. Owner ☐ 2. Director/ Manager ☐ 3. Partner/ Shareholder ☐ 4. Officer/ Coordinator	Yes	Yes
Q4. Highest educational qualification achieved *(tick one only)* ☐ 1. Bachelors ☐ 2. Masters ☐ 3. Doctorate ☐ 4. Other, please specify: …	Yes	Yes
Q5. Your current location *(tick one only)* ☐ 1. Abu Dhabi ☐ 2. Alain ☐ 3. Dubai ☐ 4. Sharjah ☐ 5. Ras Al Khaimah ☐ 6. Other, please specify: …	Yes	Yes
Q6. Describe the ownership of your business incubator *(tick one only)* ☐ 1. Private ☐ 2. Government/ Semi-Government ☐ 3. University owned ☐ 4. Partnership/ Shareholder	Yes	Yes
Q7. What industry sectors does your business incubator support? *(tick all that apply)* ☐ 1. Renewable Energy ☐ 2. Transportation	Yes	Yes

	Applicable for	
	BI	**IE**
☐ 3. Technology ☐ 4. Education ☐ 5. Health ☐ 6. Water ☐ 7. Space ☐ 8. Other sectors; please specify: …		
Q8-A. What type of incubated clients is your business incubator considering? *(tick one only)* ☐ 1. Undergraduate students ☐ 2. Graduate students ☐ 3. Faculty members ☐ 4. Community member ☐ 5. Other, please specify: …	Yes	No
Q8-B. You joined the business incubator as: *(tick one only)* ☐ 1. Undergraduate students ☐ 2. Graduate students ☐ 3. Faculty members ☐ 4. Community member ☐ 5. Other, please specify: …	No	Yes
Q9. Type of services provided by the business incubator: *(tick all that apply)* ☐ 1. Assess entrepreneurial ideas, develop business plans, and support feasibility studies. ☐ 2. Provide different size of workstations/space with shared administrative services. ☐ 3. Provide general shared services (legal, marketing, HR, accounting, financial, IT, etc.). ☐ 4. Provide mentoring and different types of training (technical, soft skills, management). ☐ 5. Organize networking events. ☐ 6. Support start-up creation and licensing. ☐ 7. Other, please specify: …	Yes	Yes

	Applicable for	
	BI	**IE**
Q10. How many people work in your business incubator as? ☐ A. Full time: (……) ☐ B. Part time: (……)	Yes	No
Q11. How many start-ups have been created by your incubated clients? *(tick one only)* ☐ 1. None ☐ 2. Between 1 – 5 start-ups ☐ 3. Between 6 – 10 start-ups ☐ 4. Between 11 – 15 start-ups ☐ 5. More than 15 start-ups	Yes	No
Q12. How many entrepreneurs have been graduated from your incubator? *(tick one only)* ☐ 1. None ☐ 2. Between 1 – 5 graduates ☐ 3. Between 6 – 10 graduates ☐ 4. Between 11 – 15 graduates ☐ 5. More than 15 graduates	Yes	No
Q13. How many entrepreneurs are currently incubated? ***(tick one only)*** ☐ 1. None ☐ 2. Between 1 – 5 entrepreneurs ☐ 3. Between 6 – 10 entrepreneurs ☐ 4. Between 11 – 15 entrepreneurs ☐ 5. More than 15 entrepreneurs	Yes	No
Q14. How many entrepreneurs dropped out of the incubation process? *(tick one only)* ☐ 1. None ☐ 2. Between 1 – 5 entrepreneurs ☐ 3. Between 6 – 10 entrepreneurs ☐ 4. Between 11 – 15 entrepreneurs ☐ 5. More than 15 entrepreneurs	Yes	No
Q15. Gender ***(tick one only)*** ☐ 1. Male ☐ 2. Female	No	Yes
Q16. Age: (……..)	No	Yes
Q17. You joined the business incubator as: *(tick one only)*	No	Yes

	Applicable for	
	BI	**IE**
☐ 1. Undergraduate students ☐ 2. Graduate students ☐ 3. Faculty members ☐ 4. Community member ☐ 5. Other, please specify: …		
Q18. How many years of total work experience do you have? *(tick one only)* ☐ 1) 0 – 2 years ☐ 2) 3 – 5 years ☐ 3) 6 – 10 years ☐ 4) More than 10 years	No	Yes
Q19. For how long you are based in the business incubator? *(tick one only)* ☐ 1) 0 – 2 months ☐ 2) 3 – 6 months ☐ 3) 7 – 12 months ☐ 4) More than 12 months	No	Yes
Q20. How many people have your business been able to employ? ☐ 1) None ☐ 2) Between 1 – 3 employees ☐ 3) Between 4 – 7 employees ☐ 4) More than 7 employees	No	Yes

Part Two: The Internal Success Factors of Business Incubator:

F1: indicate the level of availability of the followings in your business incubator *(Applicable for BI & EI)*

F1. Level of availability of these factors in business incubator	Not available	Slightly available	Moderately available	Available	Highly Available
A. Our business incubator has entry and exit criteria	1	2	3	4	5
B. Our business incubator has contracts for their incubatees	1	2	3	4	5

F2: indicate the accessibility level of your incubator *(Applicable for BI & EI)*

F2. Business incubators level of accessibility to	Not accessible	Slightly accessible	Moderately accessible	Accessible	Highly accessible
A. Information sources	1	2	3	4	5
B. Expertise in targeted fields	1	2	3	4	5
C. Fund sources	1	2	3	4	5
D. Targeted customers	1	2	3	4	5

F3: indicate the level of qualification and experience in your Business Incubator's management team *(Applicable for BI & EI)*

F3. Level of qualification and experience of Business Incubators' management team	Very low	Low	Average	High	Very high
A. The qualification of management team	1	2	3	4	5
B. The experience of management team	1	2	3	4	5

F4: indicate the level of qualification and experience in your Business Incubator's technical team *(Applicable for BI & EI)*

F3. Level of qualification and experience of Business Incubators' technical team	Very low	Low	Average	High	Very high
A. The qualification of technical team	1	2	3	4	5
B. The experience of technical team	1	2	3	4	5

F5: indicate the level of capability of your business incubator in terms of … *(Applicable for BI & EI)*

F5. Level of capability of business incubator in …	Not capable	Low capable	Acceptable capable	Capable	Highly capable
A. Generating and assessing entrepreneurial ideas	1	2	3	4	5
B. Testing concepts and assessing the feasibility of new products/ services	1	2	3	4	5
C. Supporting intellectual property protection	1	2	3	4	5

Part Three: The External Success Factors of Business Incubator:

F6: rate the level of governmental support for your business incubator *(Applicable for BI & EI)*

F6. Level of governmental support for business incubator with …	No support	Acceptable support	Good support	Very Good support	Excellent support
A. Policies	1	2	3	4	5
B. Incentives	1	2	3	4	5
C. IP protection services	1	2	3	4	5
D. Access to fund	1	2	3	4	5

F7: indicate the level of availability of financial resources for your business incubator *(Applicable for BI & EI)*

F7. Level of availability of financial resources for business incubator	Not available	Slightly available	Moderately available	Available	Highly Available
A. Government funds	1	2	3	4	5
B. Private sector funds/sponsorship	1	2	3	4	5
C. Venture capital funds	1	2	3	4	5
D. Banks loans	1	2	3	4	5
E. R&D funds at universities	1	2	3	4	5

F8: indicate the level of collaboration of your business incubator *(Applicable for BI & EI)*

F8. Level of collaboration of business incubator with …	No collaborate	Acceptable collaborate	Good collaborate	Very good collaborate	Excellent collaborate
A. Universities	1	2	3	4	5
B. Respective industry developers	1	2	3	4	5

F9: rate your opinion regarding the entrepreneurship culture in the UAE *(Applicable for BI & EI)*

F9. Opinion regarding the entrepreneurship culture in …	Very low	Low	Average	High	Very high
A. Identifying novel ideas	1	2	3	4	5
B. Risk taking	1	2	3	4	5
C. Identifying future opportunities	1	2	3	4	5
D. Willingness to be nurtured within business incubators	1	2	3	4	5

Part Four: The Success Indices of Business incubators in the UAE:

F10: indicate the level of success of your business incubator *(Applicable for BI & EI)*

F10. Level of success of business incubator in …	Not successful	Slightly successful	Moderately successful	Successful	Extremely successful
A. Graduating entrepreneurs from the incubator	1	2	3	4	5
B. Creating start-up companies	1	2	3	4	5
C. Sustaining incubated entrepreneurial businesses	1	2	3	4	5

Part Five: The Role of Business Incubators in Supporting Entrepreneurial Practices in the UAE:

F11: rate the importance of your business incubator (*Applicable for BI & EI)*

F11. Importance of business incubator in …	Not important	Slightly important	Moderately important	Important	Extremely important
A. Developing entrepreneurship culture	1	2	3	4	5
B. Contributing to local economy	1	2	3	4	5
C. Supporting national innovation strategy in the UAE	1	2	3	4	5
D. Nurturing entrepreneurs	1	2	3	4	5
E. Creating jobs	1	2	3	4	5
F. Commercializing new products and services	1	2	3	4	5

F12: Why did you choose to move into a business incubator? *(Applicable for EI only)*

F12. Reason to choose to move into a business incubator	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree
A. Competitive market rate for workstations/ office space	1	2	3	4	5
B. Facilities, services, and networking	1	2	3	4	5
C. Fund sources	1	2	3	4	5
D. Support in creating start-ups	1	2	3	4	5

Appendix VI: A Summary of all Business Incubators in the UAE

1] *UAEU Science and Innovation Park (SIP) – UAE University*: Being under a national university, and since its inception in 2016, SIP seeks to support the country in transferring from oil-based to an innovation-based economy. To achieve that, SIP created an incubation platform to develop potential entrepreneurs and support their innovative businesses in the fields of renewable energy, transportation, education, health, water resources, space, and technology. The business incubator at SIP which is attached to UAE University, offers their incubated entrepreneurs with facilities and resources from ideation until launching their start-ups in order to sustain their entrepreneurial businesses.

2] *StartAD, NYU Abu Dhabi*: StartAD is an incubator anchored at NYU Abu Dhabi University and located in Abu Dhabi City. StartAD is a platform for entrepreneurship community that aims to support entrepreneurial ecosystem in the UAE by providing useful programs and education initiatives for their range of members from early stage entrepreneurs to innovators. StartAD offers for entrepreneurs shared spaces and meeting areas for community events, as well as labs that are equipped with tools that can prototype products and services.

3] *RAK Incubator and Accelerator*: RAK Incubator is a private incubator that recently established in the Emirate of Ras Al Khaimah by a group of private investors. The incubator is established to enhance entrepreneurship and start-up culture in the Emirate by offering multiple services such as shared spaces, mentorship, and networking. RAK Incubator is designed for early and seed stage start-ups mainly in technology field and help them launching their minimal viable products (MVP) and raise fund for them from different sources.

4] The Cribb: The Cribb is private business incubator established in Dubai aiming to embrace potential entrepreneurs and support them to establish their

innovative businesses. The Cribb provides variety of services for entrepreneurs and start-ups as well as large firms such as accelerator program, networking activities, and joint venture arrangements.

5] *Krypto Labs*: Krypto Labs incubator is a private incubator that recently opened in Abu Dhabi city and associated with Abu Dhabi Financial Group. Krypto Labs is designed to support early stage start-ups in order to help them accessing the market by providing a range of facilities and resources such as fund, mentorship, networking, as well as administration support services.

6] *In5*: In5 is a semi government business incubator based in Dubai and established by TECOM Group. In5 seeks to support Dubai ecosystem for entrepreneurs and start-ups to be incubated and nurtured to their next phase of growth. In5 focuses on technology, and design industry. In5 provide entrepreneurs with specialized facilities and services in order to develop their innovative ideas into commercial businesses.

7] *ENTELAK*: ENTELAK is also a semi government business incubator based in Dubai and established through collaboration between The Emirates Group, GE & ETISALAT. ENTELAK focused on nurturing and developing aviation and travel start-ups in the region. ENTELAK offers structured training modules, mentorship, and fund aiming to sustain their ventures into tourism and travel industry.

8] *Hamdan Innovation Incubator* (HI2): HI2 is a division of Mohammed Bin Rashid Establishment, which fund and support entrepreneurs and offer incubation services. HI2's vision is to enable Dubai to become an entrepreneurial capital of the region. HI2 serves in all industries and offer entrepreneurs with facilities and services to foster start-ups through three stages of simplified process.

9] *Dubai Technology & Entrepreneurship Centre* (DTEC): Based in Dubai's Silicon Oasis, DTEC is a semi-government technology, entrepreneurial and innovation hub designed to accommodate and support innovative businesses. DTEC business incubator offers range of services including venture capital seed stage funding along with a flexible program such as mentoring, networking, and legal support.

10] *Khalifa Innovation Centre* (KIC): KIC is an innovative incubation centre established in 2016 as joint venture platform between Mubadala, Tawazun, Khalifa Fund, and Khalifa University. KIC aims to support high impact start-ups and potential entrepreneurs welling to launch their innovative products and services in the market. KIC promotes for innovation among UAE entrepreneurs and helping them to commercialize their innovative entrepreneurial projects at micro level and support the transition of UAE to a knowledge-based economy at macro level. Throughout the incubation cycle, KIC offers for its clients a range of services and facilities as well as co-working spaces.

11] *Sharjah Entrepreneurship Centre* (SHERAA): SHERAA is a government incubator based in American University of Sharjah which established in 2016. SHERAA takes aspiring entrepreneurs on an exciting journey to support and develop their innovative ideas through innovative activities such as pre-accelerator, accelerator, and launching start-ups in order to help them establishing their businesses. SHERAA equip their clients with different services such as pre-seed funding, networking, and mentoring during entrepreneurship cycle.

Appendix VII: How to Measure Business Incubations' Success

Interviewee No.	Stakeholder Category	How to Measure Business Incubation's Success?
Expert 01	Government Supporter	1) Number of IP creation 2) Number of incubated entrepreneurs 3) Number of graduates of entrepreneurs in science and technology fields 4) Contribution of incubated start-ups in the GDP
Expert 02	Government Supporter	1) Number of transferred ideas into businesses 2) Number of enabled start-ups that entered the market 3) Number business that generates revenue 4) Number business that sustained in the market
Expert 03	Government Supporter	1) Number of intakes into the incubators 2) Number of ideas collected 3) Number of sustained businesses
Expert 04	Government Supporter	1) Number of MOUs the start-ups have signed 2) Number of innovation driven enterprises established 3) Number of innovation jobs built
Expert 05	Government Supporter	1) Number of companies that graduated 2) Number of innovation driven enterprises established that are scalable 3) Number of commercial funding raised 4) Number of venture fund received
Expert 06	Start-up Investor	1) Amount of funds spent on entrepreneur 2) The sustainably of operating model 3) Number of projects that partially government sponsored 4) Number of partially privately supported
Expert 07	Start-up Investor	1) How many good start-ups have come out of incubators? 2) How many good start-ups have come back to incubators? 3) How many start-ups have we made success in the market beyond incubator
Expert 08	Start-up Investor	1) Number of entrepreneurs went through incubation cycle 2) Number of graduated entrepreneurs 3) Number of jobs created out of start-ups 4) Number of failure start-ups have celebrated

Interviewee No.	Stakeholder Category	How to Measure Business Incubation's Success?
Expert 09	Start-up Investor	1) Number of individuals that sought entrepreneurship as career 2) Number of successful start-ups created
Expert 10	Start-up Investor	1) Number of successful start-ups created 2) Number of start-ups that are scalable and sustainable in the market
Expert 11	Incubator Management	1) Number of sustainable start-ups in the market 2) Number of survivals rate out of incubated entrepreneurs
Expert 12	Incubator Management	1) Number of UAE nationals employed within incubated start-ups 2) The contribution to the GDP 3) Number of business generated through R&D 4) Number of patents transformed into businesses 5) Number of conversion rate of businesses going to the next stage of growth
Expert 13	Incubator Management	1) Number of jobs taken within start-ups 2) Number of sustained businesses
Expert 14	Incubator Management	1) Number of start-ups funded 2) Number of start-ups raised investment
Expert 15	Incubator Management	1) Number of people have been employed as an effect of joining the incubator 2) How much revenue in aggregate each start-up is making? 3) The return on investment for private Business Incubators 4) Number of start-ups graduated from government incubators
Expert 16	Mentor at Incubator	1) Number of start-ups that came out of incubators 2) Number of registered patents 3) Number of fund raised by each start-up
Expert 17	Mentor at Incubator	1) The contribution to the GDP 2) Number of graduates from incubators
Expert 18	Mentor at Incubator	1) Number of successful incubated entrepreneurs

Interviewee No.	Stakeholder Category	How to Measure BIs' Success?
Expert 19	Mentor at Incubator	1) Number of start-ups established 2) Number of start-ups became successful 3) Number of applicants increased to join an incubator 4) The Growth of incubated start-ups 5) Number of jobs created
Expert 20	Mentor at Incubator	1) Number of businesses sustain after the incubator 2) Number of new patents that come out of incubated start-ups
Expert 21	Incubated Entrepreneur	1) Number of businesses created 2) Number of sustained businesses 3) Number of start-ups that have records of sales
Expert 22	Incubated Entrepreneur	1) Number of trained entrepreneurs 2) Number of start-ups applied 3) Number of start-ups applied were accepted 4) Number of start-ups succeeded after three years 5) Number of employees have been recruited 6) How much revenues have start-ups generated? 7) How much external funding have they raised
Expert 23	Incubated Entrepreneur	1) Number of graduated entrepreneurs with recurring revenue. 2) Number of jobs created by entrepreneurs
Expert 24	Incubated Entrepreneur	1) Number of start-ups created
Expert 25	Incubated Entrepreneur	1) Number of networking and programs conducted at incubator

Appendix VIII: Key Success Factors of BIs in the UAE

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
Expert 01	Government Supporter	1) Souring entrepreneurs 2) Incubators capable to commercialize businesses 3) Having investment by government & private 4) Accessing to industry needs 5) Provide value added services 6) Collaboration with industry
Expert 02	Government Supporter	1) Government support by waiving utility cost 2) Establish a culture of entrepreneurship 3) Accessing to fund 4) Supporting IP 5) Having expertise, advisors, and mentors 6) Having infrastructure, space, and resources 7) Able to access the market and customers 8) Able to educate entrepreneurs 9) Able to commercialize businesses
Expert 03	Government Supporter	1) Having capabilities that can motivate & share knowledge 2) Able to import entrepreneurs 3) Government policies and legislations 4) Able to connect with business environment 5) Able to commercialize and sustain businesses 6) Having risk-taking entrepreneurs 7) Having more venture Capitals 8) Promote entrepreneurship culture among parents
Expert 04	Government Supporter	1) Having HR resources that can manage start-ups 2) Being patient with the ideas of entrepreneurs 3) Sourcing entrepreneurs 4) Improve government legislations 5) Sourcing innovative driven entrepreneurs 6) More venture capitals 7) Growth on number of patents and applied research
Expert 05	Government Supporter	1) Business relationships with government & private 2) Having different types of funding 3) Balance the wages of government comparing to private 4) Utilization of different funds 5) Having expertise that quote the funds, attract them, and make a viable business proposition 6) Enabled entrepreneurs to access university resources 7) Provide government incentives for entrepreneurs to come 8) Sourcing entrepreneurs from universities

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
Expert 06	Start-up Investor	1) A liaison for collaboration between entrepreneurs, investors and government entities 2) Having management with entrepreneurial background 3) Having knowledgeable & connected management 4) Having structured funding for entrepreneurs 5) Government support that can help start-ups to access markets 6) Sourcing knowledgeable entrepreneurs that can drive applied research to commercial businesses
Expert 07	Start-up Investor	1) Having technical team that can offer mentorship 2) Having facilities that can help entrepreneurs 3) Provide value added services that makes entrepreneurs comes back 4) Able to register and launch start-ups in the market 5) Can access to customers, market, and able to network 6) Sourcing graduates with entrepreneurial cultural 7) Offer financial resources and educate about it 8) Sourcing novel ideas from universities 9) Reduce risk of opening start-ups &financial consequences
Expert 08	Start-up Investor	1) Avoiding “real estate” operating model 2) Provide quality services and programs that can develop entrepreneurial skills 3) Having technical resources 4) Having budget spent on programs and events 5) Having legal framework to reduce cost of starting a business 6) Having different financial support 7) Sustainable operating model supported by government 8) Sourcing talented entrepreneurs for joining the incubator 9) Facilitating the procedures of setting up companies.
Expert 09	Start-up Investor	1) Learn entrepreneurs how to commercialize 2) Expose entrepreneurs to successful role models 3) Expose entrepreneurs to corporates, investors, & market 4) Offer technical mentorship and specialized services 5) Focus on specific industries and specialize in it 6) Having government regulations that supports incubators 7) Reduce the cost of experimentation and risk

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
Expert 10	Start-up Investor	1) Having legal framework by government for incubation market and facilitate incubation license for private investors 2) Promote entrepreneurship as career away from corporate or government jobs and provide incentives as well as reduce their cost and risk 3) Having experienced team that can help commercialize ideas 4) Having an operating model that can sustain the incubator 5) Able to offer different funds at different stages particularly more venture capitalist 6) Able to network and pilot with customers and market 7) Able to access to sources of knowledge and facilities at universities 8) Source talented entrepreneurs to prepare them at universities to generate entrepreneurial ideas 9) Turn applied research into potential commercialized projects at universities in order to generate novel ideas 10) Develop university bylaws to facilitate entrepreneurial ventures.
Expert 11	Incubator Management	1) Create and integrate ecosystem conditions by the government 2) Having unfair advantages that start-ups can have such as funding, networking, accessing to experts, and accessing to customers 3) Having training, mentoring, and coaching 4) Gear R&D toward entrepreneurial ventures 5) Develop regulations and policies that can support incubators and start-ups 6) Facilitate banking regulations for start-ups and incubators 7) Facilitate the registration of companies 8) Support start-ups with innovative components through knowledge transfer from universities
Expert 12	Incubator Management	1) Having financial & legislation support from government 2) Having systematic link and integration with universities particularly with research and development 3) Having a culture of entrepreneurship 4) Linking entrepreneurship with innovation practices 5) Able to manage patent of the business 6) Increase the number of venture capitalists

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
		7) Having a framework where academia, R&D, funding, VCs are in the same place to support start-ups 8) Increase applied research that can turn to commercialized ventures
Expert 13	Incubator Management	1) Facilitate licensing and registration by the government 2) Open the market for start-ups products & services 3) Access to funding and availability of angel investors 4) Ability to commercialize entrepreneurial ventures 5) Access to mentors that can provide technical knowledge or skills 6) Having networking capability in order to access to market and customers 7) Sourcing innovative and problem-solving entrepreneurs 8) Changing the corporate mind-set toward entrepreneurs 9) Ability to access to data, information, & knowledge
Expert 14	Incubator Management	1) Ability to build a business 2) Sourcing entrepreneurs 3) Provide incentives for entrepreneurs 4) Experience in method of spending funds 5) Ability to manage Intellectual property 6) Ability to access the market and customers 7) Improve policies and procedures for establishing a business
Expert 15	Incubator Management	1) Having empowered management and finding technical resources to run programs 2) Having sustained fund for incubator to grow 3) Having more venture capitalist 4) Having support from ecosystem (investors, mentors, educational, etc.) 5) Having university support (legislations, knowledge, training, facilities, labs, etc.) 6) Sustain the flow of idea coming from education institutes 7) Providing mentorships, training, and networking 8) Partnering innovative driven enterprises 9) Access to industry information and knowledge 10) Reduce the risk of entrepreneurial ventures.
Expert 16	Mentor at Incubator	1) Should be attached to university 2) Build an ecosystem 3) Have financial channels 4) Have networking channels 5) Have government channels

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
		6) Develop supportive policies by government 7) UAE culture is very risk averse 8) Develop entrepreneurship culture 9) Having capable team and have commercialization capability
Expert 17	Mentor at Incubator	1) Having experts that can operate and run programs 2) Able to connect with venture capitalists 3) Able to source funds 4) Increase awareness of incubation & entrepreneurship 5) Having legislations that can protect incubators and start-ups 6) Focused incubators that have criteria for incubating the right products and services 7) Increase the risk taking of entrepreneurs 8) Having collaboration with universities
Expert 18	Mentor at Incubator	1) Involve government in the business of incubation 2) The presence of multinational investors 3) Involve universities in the business of incubation 4) Having mentoring, coaching, training, and marketing services 5) Improving entrepreneurship culture
Expert 19	Mentor at Incubator	1) Access to technology 2) Ability to do match-making between start-ups and corporates 3) Access to funds 4) Provide mentoring for start-ups 5) Ability to support in intellectual property 6) Having criteria of selecting 7) Access to the best practices through networking 8) Having legislations that support university-based incubators to establish incubators 9) Develop entrepreneurship culture
Expert 20	Mentor at Incubator	1) Providing real support for accessing the market, accessing capital, mentors, and knowledge 2) Improving policies that support and incentivize entrepreneurs and start-ups in terms of licensing process and costs. 3) Support funding starting from pre-seed stage until bank funding 4) Adding licensing category for business incubation 5) Having specialized technical team 6) More awareness about entrepreneurship culture to reduce the risk-taking behaviour 7) Flow of entrepreneurs coming to the incubators 8) Access to resources like freelancers 9) Access to markets

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
Expert 21	Incubated Entrepreneur	1) Formulating incubators in order to be developed as career for entrepreneurs 2) Having capabilities that can connect all the services for entrepreneurs 3) Market readiness to absorb incubators' products and services 4) Accessing to investors and angel investors 5) Having accountable and supportive government bodies for the business of incubation 6) Having collaborations with universities in order to access labs and knowledge. 7) Facilitate government legislations like visa and licensing 8) Having technical facilities at the incubator 9) Optimize resources with other incubators
Expert 22	Incubated Entrepreneur	1) Having management that have start-up experience 2) Are focused on the needs of customers at private corporates and government entities 3) Can access to relevant knowledge, market, and funds through useful networks 4) Having collaboration among other incubators 5) Are integrated with universities in order to access to expertise and patents 6) Having government policies and incentives that gives advantage for incubators to operate 7) Having legislations that makes start-ups completely bankruptcy free 8) Having more international investors and able to manage funds smartly 9) Provide value added services
Expert 23	Incubated Entrepreneur	1) Provide internal or external expertise that will support entrepreneurs 2) Change a culture that just look for jobs than being an entrepreneur 3) Improve government policies for licensing and issuing visas for entrepreneurs 4) Ease government policies in order to increase the risk-taking behaviour 5) Limited innovative and novel ideas 6) Accessing and partnering with customers
Expert 24	Incubated Entrepreneur	1) Aligned with national strategic objectives (innovation) 2) Able to create value added services 3) Able to introduce products in the market 4) Able to work closely with ecosystem 5) Have smart funding capability 6) Reduce the levels of fear of failure among entrepreneurs

Interviewee No.	Stakeholder Category	Key Success Factors for BIs in the UAE
		7) Flexibility of academic policies with regards to entrepreneurship and incubators 8) Treating university students as entrepreneurs 9) Sourcing entrepreneurs from universities 10) Having capable team to manage incubators
Expert 25	Incubated Entrepreneur	1) Improve regulations of government in terms of issuing license for start-ups within incubators 2) Enhance licensing procedure 3) Ability to access the market and customers to prove business concepts 4) Ability to network with government, semi-government, and private corporates 5) Ability to access to financial resources to sustain the operation of the incubator 6) Able to collaborate with other incubators 7) Improve entrepreneurial culture in educational institutes 8) Ability to access to university resources through partnership and legislations 9) Ability of utilizing the advance knowledge coming out of applied research

Appendix IX: Roles of BIs in the UAE

Interviewee No.	Stakeholder Category	Roles of BI in the UAE
Expert 01	Government Supporter	1) Supplying entrepreneurs in targeted industries 2) Contribution to GDP 3) Support innovation strategies 4) Training entrepreneurs
Expert 02	Government Supporter	1) Generate more technologies from UAE nationals 2) Supporting the transferring from oil economy to knowledge-based economy 3) Enhance the country's position in the global innovation index 4) Creating jobs
Expert 03	Government Supporter	1) Improve entrepreneurs' mind-set 2) Support knowledge-based economy 3) Diversify economy 4) Having the mind-set of supporting innovation strategies. 5) Change to innovative related jobs
Expert 04	Government Supporter	1) Support the growth of start-ups 2) Attract global entrepreneurs
Expert 05	Government Supporter	1) Create economic value for the UAE 2) Support the transition to fourth industrial revolution 3) Diversify the economy 4) Support harnessing the collaboration between academia, government and private sector 5) Nurture entrepreneurs 6) Establish creative enterprises 7) Create innovative products and service
Expert 06	Start-up Investor	1) Develop entrepreneurship community 2) Contribute to the GDP 3) Develop entrepreneurs in all related aspects
Expert 07	Start-up Investor	1) Develop entrepreneurship community 2) Increase the chance of establishing companies 3) Create jobs
Expert 08	Start-up Investor	1) Enhance the entrepreneurship culture and mind-set 2) Support the country's GDP

Interviewee No.	Stakeholder Category	Roles of BI in the UAE
		3) Create new economies 4) Create a meaningful entrepreneurial ecosystem 5) Enhance the networking and engaging with government, corporates, investors 6) Push the government toward improving the regulations related to entrepreneurs 7) Take incubated companies, to the next level 8) Open new careers opportunities away from government jobs 9) facilitate and filter good entrepreneurs 10) Create jobs by private sector 11) Increase the number of companies created by incubators 12) Helping fundamental primary research to be commercialize
Expert 09	Start-up Investor	1) Increase entrepreneurial generation that do not depend on government jobs, 2) Develop successful start-ups and feed them into the market 3) Develop independent entrepreneurs 4) Create start-ups that create jobs 5) Develop and source solutions for government services
Expert 10	Start-up Investor	1) Developing a generation of talents that can occupy advanced jobs 2) Fuel local economy through spending 3) Support diversifying industries 4) Increase the number of SMEs that can create value in the market 5) Prepare entrepreneurs for the future 6) Facilitate the process for entrepreneurship development 7) Creates companies that create jobs 8) Create new types of jobs 9) Help finding jobs by creating companies 10) Develop skills for successful entrepreneurship
Expert 11	Incubator Management	1) Enhance the competitive advantage of SMEs 2) Support local economic growth 3) Develop skilled and experienced entrepreneurs

Interviewee No.	Stakeholder Category	Roles of BI in the UAE
Expert 12	Incubator Management	1) Reshaping entrepreneurship policies 2) Support the creation of small and medium enterprises in a regular framework 3) Diversify the economy 4) Support entrepreneurship ecosystem 5) Accelerate the growth of businesses 6) Support increasing the overall entrepreneurs' income
Expert 13	Incubator Management	1) Generate more start-ups 2) Support knowledge-based economy 3) Support solving actual problems of government and corporates 4) Enhance the learning opportunity for entrepreneurs 5) Introduce new products and services
Expert 14	Incubator Management	1) Diversification of the economy 2) Contribution to GDP 3) Support national innovation strategy 4) Helping entrepreneurs to set up their company 5) Create jobs and create wealth for entrepreneurs
Expert 15	Incubator Management	1) Support the networking for entrepreneurs 2) Nurturing entrepreneurs
Expert 16	Mentor at Incubator	1) Economic growth 2) GDP growth 3) Opportunity for networking, guidance, and mentorship
Expert 17	Mentor at Incubator	1) GDP contribution 2) Develop successful entrepreneurs
Expert 18	Mentor at Incubator	1) Support innovation practices 2) Nurture entrepreneurs 3) Help moving the employment to private sector 4) Support moving toward innovative products and services
Expert 19	Mentor at Incubator	1) Bring corporates closer to entrepreneurs and start-ups 2) Diversify the economy 3) Provide tools for entrepreneurs to improve 4) Develop the next generation of entrepreneurs 5) Create own jobs

Interviewee No.	Stakeholder Category	Roles of BI in the UAE
Expert 20	Mentor at Incubator	1) Source innovative ideas 2) Enhance the economic environment 3) Support the GDP of the country 4) Support enhancing in the global innovation index 5) Generate income for entrepreneurs 6) Create job opportunities
Expert 21	Incubated Entrepreneur	1) Support producing more businesses 2) Support the country's GDP 3) Support educating entrepreneurs 4) Nurture entrepreneurs
Expert 22	Incubated Entrepreneur	1) Support enhancing the entrepreneurship culture 2) Generate revenues for entrepreneurs 3) Help government entities and big corporates to be more innovative 4) Play catalyst role between government & entrepreneurs
Expert 23	Incubated Entrepreneur	1) Contribute to country’s GDP 2) Contributed to creating more start-ups that are scalable 3) Increase the chance of developing more novel and innovative ideas 4) Contribute to creating jobs away from government
Expert 24	Incubated Entrepreneur	1) Making positive impact on entrepreneurship culture 2) Play the role of inspiration for the next generations of entrepreneurs 3) Support in increasing the number of patents to be commercialized 4) Develop the entrepreneurial skills needed by the country 5) Create employment opportunities
Expert 25	Incubated Entrepreneur	1) Support pushing government to facilitate regulations and services for entrepreneurs 2) Play the role of catalyst for attracting experts 3) Support growing the experience of entrepreneurs 4) Support transferring knowledge from international to local market 5) Support creating jobs for local sources 6) Help introducing new products and services into the market

Appendix X: Summary of National Innovation Strategy

1] Introduction:

i] Recognizing innovation as a cornerstone of social and economic development, nations around the world have developed national innovation strategies and frameworks.

ii] Innovation is key to promoting economic growth, increasing competitiveness, and providing new job opportunities.

iii] Innovation is defined as the aspiration of individuals, private institutions and governments to achieve development by generating creative ideas and introducing new products, services, and operations that improve the overall quality of life. Innovation is essential to:

- Creating high skilled jobs.
- Enhancing knowledge economy.
- Improving competitiveness.
- Improving the quality of life.
- Increasing economic diversification.
- Promoting entrepreneurship.

2] Innovation Ingredients:

- Human Capital and Research.
- Institutions and Regulatory Environment.
- Innovative Products and Services.
- Knowledge and Technology.
- Infrastructure.
- Competitive Environment.
- Funding and Investment.

3] UAE Vision:

- Believing that innovation is the future of human investment, the UAE leadership emphasizes its importance across all sectors through the UAE vision 2021: “innovation, research, science, and technology will form the pillars of a knowledge-based, highly productive and

competitive economy, driven by entrepreneurs in a business-friendly environment where public and private sectors form effective partnerships.

- Driving from its strong belief that building a human capital is far more critical than urban development.
- UAE distinctly demonstrates its ability to attract and retain top talent by becoming a primary destination for educated Arab youth seeking a better professional and personal life, besides ranking first worldwide in attracting global talent.

4] Importance: The strategy is launched to sustain the UAE's leading position in the region and realize its ambition of becoming one the most innovative nations in the world.

5] Aim: Take innovation in the UAE to new heights, where a culture of innovation is embedded amongst individuals, companies, and governments.

6] Focus: The framework is structured around the following key pillars:

i] *An Innovation-Enabling Environment*:

- Innovation Regulatory Framework.
- Technology Infrastructure.
- Enabling Services.
- Investment and Incentives.

ii] *Innovation Champions*:

- Innovative Individuals.
- Innovative Companies and Institutions.
- Innovative Government.

iii] *Identify priority sectors that will drive future innovation* including Education; Health; Renewable and clean energy; Space; Technology; Transportation; and Water resources.

Appendix XI: Science, Technology, Innovation Policy in the UAE

i] *Introduction*: The Aim of STI policy is to be a turning point in the country's march towards progress, economic diversification, and prosperity, and to prepare the UAE for a post oil world.

ii] *National Innovation Strategy Framework*: The national science, technology and innovation committee was mandated to:

- Monitor the implementation of the national innovation strategy and the policies and initiatives that emanate from it.
- Enhance coordination, cooperation and exchange of expertise among federal and local entities.
- Follow up progress of innovation initiatives and its related indices nationwide.
- Engage the private sector and ensure that its social and economic contributions stimulate innovation.

iii] *The Importance of science, technology, and innovation policy*:

- Investing STI in order to achieve socio-economic development.
- STI opens up opportunities for faster economic growth and creates sustainable wealth that independent of natural and non-renewable resources.
- A focus on STI fosters investment in talent and human capital required for development.
- Provide innovative solutions for a number of challenges in health, security, environment, and society.
- Strong relation between R&D activities carried out by the countries and their level of economic development.
- Countries focused on STI through spending on R&D have higher per capital income levels.
- Public investment in R&D contributed to achieving big leaps in innovation and development in many fields such as the internet, space, and health, while various evidence points to high returns on investment for the firms in the private sector that invest in R&D.

iv] *Focus Areas of STI Policy*: The STI policy's focus areas have been identified according to the following criteria:

- Meeting present and future national needs, so that these areas contribute to tackling some challenges that are faced both nationally and regionally.
- Aligning with present and future international trends, so that these areas contribute to benefiting from opportunities and developments emerging worldwide.
- Aligning with the country's capabilities and unique assists, so that the UAE can become a world leader and simultaneously achieve high returns.

v] *24 focus areas for science and technology-based innovation* have been determined by the UAE, which represents a mix of opportunities and challenges nationally and regionally:

1] <u>Education Innovation and Technology:</u>

- Tools to advance student learning including:
  - Software and digital materials such as online learning platforms.
  - Hardware such as network infrastructure, telecommunication, and internet services.

2] <u>Health Information Technology and Bioinformatics:</u>

- Health IT applications:
  - Distance medicine.
  - Management of patient record.
  - Data analysis.
  - Bioinformatics.

3] <u>Public Health, Non-Communicable Diseases and Wellness:</u>

- Encompasses the adoption of health information technology to help improve the accessibility, quality, and outcomes of healthcare services.
- Healthcare policy research.

4] <u>Biotechnology and Genomics:</u>

- Biological processes, organisms, cells, or cellular components are exploited to develop new technologies.
- New tools and products developed by biotechnologies that can be used for research, agriculture, industry, and healthcare delivery.

- Scientific progress in Genomics led to a revolution in the field of scientific research concerning comprehending the biological systems.

5] Water Management and Economics:

- Water recycling and waste management technologies and systems.
- Produced water from oil and gas exploration treatment.
- Desalinization technologies.
- Water pricing and incentives in desert and drought environments.

6] Solar and Alternative Energy Technology Systems:

- R&D and economic models needed to advance the deployment and adoption of solar and alternative energy technology systems.
- Using solar energy in water desalination.
- Generating and distributing solar energy and reducing its cost.

7] Space Sciences:

- Exploring celestial bodies, developing satellite communications technology.
- Deploying the latest space technologies in terrestrial applications.

8] Cubesats and Nanosatellites:

- Developing, building, and operating satellites requires a host of specialized services and technologies at every point of the value chain.
- Applications of remote sensing through satellites, including national resources mapping, environmental monitoring, land use planning, and security.

9] Cybersecurity:

- The need for security for systems that include smart manufacturing, smart grid and utilities, smart buildings and infrastructure, smart transportation and mobility, smart healthcare, and smart border controls.
- Technologies that lie at the nexus of digital security due to its focus on being a leader in the area of smart city and smart government applications.
- A centre for international banking, commerce, logistics, transportation, and the growing use of social networking, cloud computing, smartphones, and smart applications.

- Focusing on science and technology research in this field would be of great importance.

10] Semiconductor Process Development:

- Semiconductors in computers, mobile phones, and TVs.
- Electronic parts such as transistors and solar cells.
- Developing semiconductor manufacturing and testing services in the UAE.
- Increase the relevant research projects in national universities.

11] Robotics and Artificial Intelligence:

- Social and human service applications
- Regulative environment that encourages using robotics and the Artificial Intelligence in different sectors.
- Utilize research being conducted in its universities in the areas of engineering and materials.
- Develop robotics and Artificial Intelligence capabilities centred on social applications.

12] Smart City Applications and Solutions:

- Exploit technological solutions to improve the lives of urban dwellers and increase efficiency.
- Traffic and living conditions, resources management, waste management, and other utilities, public health and safety, and infrastructure security.
- Provide a boon to the country's IT and application development sectors.

13] Architecture and Urban Design:

- Enhancement of the country's existing expertise in architectural design.
- Develop futuristic, unique, Arabic Specific designs in architecture and urban planning.

14] Arabic Digital Technology:

- Digital media and Arabic language software.
- Arabic applications for infrastructure, social, industrial, medical, entertainment, and government services.

15] Financial Services Technology:

- Operational platform for global financial services, traditional and Islamic retail and commercial banking, capital markets services, and financial exchanges.

16] Petroleum Geosciences:

- Petroleum exploration, extraction, and refinement.
- Commercial energy needs especially those requiring high energy density such as air flight.
- Key input to an enormous range of downstream petrochemical products.
- Improving extraction efficiency and innovating in non-potable water treatment.

17] Internet of Things and Big Data:

- Interconnection of an enormous range of objects to the internet via the internet protocol.
- Research in Internet of Things technologies
- Unique test bed for experimentation in Internet of Things applications.
- The development of Internet of Things dovetails with several UAE focus areas such as transportation and smart cities.

18] Additive Manufacturing (3D Printing):

- Technologies that build 3D objects by adding successive layers of material, including plastic, metal, concentrate, other materials.
- Grow applications such as construction of the first office totally printed using the 3D technology.

19] Advanced Building and Construction Materials:

- Expanding research into how materials interact with one another and how they are assembled to form constructed systems, such as buildings bridges, and space stations.

20] Food Security:

- The type of agriculture that can be successfully pursued in desert environment.
- Advances in agriculture science hold the promise of meaningful increases in desert agricultural efficiency.

- The opportunity to enhance its research in the field of good security.

21] Transportation Logistics, analytics and Security:

- Incorporation of unmanned aerial vehicles and autonomous vehicles into existing transportation infrastructure.
- Draw on its existing expertise in international transportation logistics to create technologies and innovative systems that address myriad transportation challenges in the AUE and abroad.

22] Aerospace Advanced Materials, Manufacturing, Maintenance, & Testing:

- New manufacturing processes and new non-destructive testing methods is needed for aircraft composites. Expertise in the maintenance of aircraft equipped with the new materials.
- Research on the unique challenges of advanced aircraft maintenance in hot, industry, and desert environment.
- Manufacture conduct research on and test new aircraft materials.
- Universities to partner with UAE petrochemical companies to develop new materials and can collaborate with manufacturers to develop new testing techniques and manufacturing processes for the use in aircraft.

23] Commercial Unmanned Aerial Vehicles:

- Unmanned aerial vehicle technologies are the focus of extensive research around the globe focusing on sensors, control technologies, and materials and composites for autonomous unmanned aerial vehicle.
- Opportunity for large scale commercialization and growth of the unmanned aerial vehicle market for private use.
- Encourage universities and organizations to conduct research pertaining to this kind of aerial vehicles.

24] Autonomous Vehicles:

- Emerging technology that includes control system, sensors, and other hardware, as well as several enabling technologies.
- The development of the regulatory environment and the deployment of supporting infrastructure for the tracking and navigation of the vehicles and integration into existing infrastructure systems.
- Embrace the use of autonomous vehicles for private use by developing the supporting regulations and infrastructure.

Appendix XII: Results of Factor Analysis Using Extraction Method

	Component Matrixa									Rotated Component Matrixa									
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	Decision
Part Two: Internal Success Factors of Business Incubator:																			
F1. level of availability of the followings in business incubator																			
A. Our business incubator has entry and exit criteria	.607	.176	-.284	.017	-.169	-.241	.015	.398	.256	.444	.087	.267	.057	.207	-.116	.320	.590	-.076	
B. Our business incubator has contracts for their incubatees	.415	.220	-.124	.306	.122	.028	-.347	.444	.426	.214	.069	.139	.061	-.055	.278	.000	.829	.046	Keep
C. Our business incubator has progress criteria	.678	.253	-.383	.005	-.150	.032	.154	.090	.196	.678	.049	.189	.027	.260	.000	.256	.324	.168	Delete
F2. accessibility level of business incubator to …																			
A. Information sources	.744	.229	-.168	.029	-.381	-.118	-.099	-.232	.048	.563	.093	.632	.078	.076	.032	.267	.067	.218	
B. Expertise in targeted fields	.698	.219	-.357	-.121	.054	.116	.133	-.057	.192	.732	.229	.054	.050	.161	.062	.205	.197	.221	Keep
C. Fund sources	.696	.228	-.080	.014	-.320	.250	.130	-.224	.074	.629	.016	.386	.218	.261	.091	.039	-.026	.331	
D. Targeted customers	.638	.221	-.143	-.011	.133	.124	.251	.168	.085	.590	.120	-.050	.244	.260	.159	.184	.239	.016	
F3. level of qualification and experience in Business Incubator																			
A. The qualification of management team	.590	.154	-.213	.179	.177	-.626	.205	-.147	-.032	.293	.179	.172	.081	.003	.156	.867	.082	-.024	
B. The experience of management team	.581	.082	-.267	.241	.174	-.578	.247	-.191	-.019	.269	.180	.149	.021	.081	.194	.871	.059	.050	Keep
C. The qualification of technical team	.722	.310	-.123	-.315	.061	.135	-.043	.103	-.316	.011	.221	.189	.166	.047	.140	.800	-.026	-.304	
D. The experience of technical team	.708	.340	-.166	-.287	.037	.140	-.058	.074	-.350	.018	.176	.211	.118	.033	.160	.820	-.048	-.296	
F4. level of capability of business incubator in terms of																			
A. Generating and assessing entrepreneurial ideas	.716	.382	-.301	-.058	.202	.131	-.088	-.134	.097	.778	.226	.098	.059	-.094	.278	.166	.182	.172	
B. Testing concepts and assessing the feasibility of new products/ services	.718	.333	-.369	-.146	.151	.205	-.058	-.035	-.002	.843	.226	.081	-.006	.012	.222	.083	.156	.059	Keep
C. Supporting intellectual property protection	.721	.254	-.303	-.143	-.108	.145	.126	-.027	-.133	.789	.108	.217	.050	.230	.088	.139	.007	-.001	
D. Supporting startup creation	.746	-.013	-.195	.058	-.200	.049	-.016	-.247	.265	.471	.297	.412	.062	.226	.093	.190	.144	.415	Delete
Part Three: External Success Factors of Business Incubator:																			
F5. level of governmental support for business incubator in terms of																			
A. Policies	.684	-.152	.088	.150	-.379	-.241	-.320	-.042	-.186	.140	.261	.817	.073	.168	.169	.173	.056	-.109	
B. Incentives	.789	-.102	.037	.328	-.319	-.090	-.027	.044	-.052	.242	.148	.631	.186	.419	.275	.244	.180	.037	
C. IP protection services	.736	-.049	.051	.197	-.304	-.078	-.240	.041	-.098	.267	.200	.685	.132	.227	.244	.112	.170	-.047	Keep
D. Access to fund	.833	-.016	.070	.011	-.274	.087	-.067	.012	-.013	.452	.270	.548	.268	.315	.146	.034	.114	.046	
F6. level of availability of financial resources for business incubator																			
A. Government funds	.559	-.095	.552	-.083	-.147	.007	-.156	-.005	.080	.045	.351	.460	.569	.076	.070	-.112	.045	.003	
B. Private sector funds/sponsorship	.558	-.098	.451	-.241	-.126	-.300	.422	.121	.074	.107	.286	.180	.682	.333	-.259	.320	-.022	-.122	
C. Venture capital funds	.599	.242	.517	.004	.140	-.030	.257	.146	.020	.263	.115	.072	.779	.120	.186	.165	.092	-.113	Keep
D. Banks loans	.238	.325	.789	.086	-.034	.152	.175	.020	.055	.004	-.162	.109	.875	-.026	.160	-.132	-.043	.034	
E. R&D funds at universities	.354	.184	.600	.189	.253	.154	.148	-.146	.334	.013	.110	-.051	.749	-.053	.316	.010	.092	.331	

	Component Matrixa									Rotated Component Matrixa									
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	Decision
F7. level of collaboration of business incubator with																			
A. Respective government entities	.661	.139	.374	-.153	-.173	-.096	-.240	-.147	.093	.291	.320	.554	.480	-.122	.032	.024	.043	.067	Delete
B. Universities	.749	.197	.200	-.321	.128	.013	-.010	.044	-.051	.566	.393	.187	.468	-.003	.076	.064	.038	-.154	Keep
C. Respective industry developers	.700	.354	.270	-.333	-.042	-.071	.006	-.012	-.163	.587	.210	.321	.526	-.078	-.001	.104	-.075	-.205	
D. Respective customers	.714	.260	.261	-.049	.152	-.186	-.076	.230	-.100	.395	.245	.261	.492	-.037	.223	.218	.226	-.312	Delete
F8. opinion regarding the entrepreneurship culture in the UAE in terms of																			
A. Identifying novel ideas	.714	-.005	.003	.395	.273	.038	-.131	.228	-.176	.275	.240	.208	.152	.223	.656	.181	.298	-.201	
B. Risk taking	.651	.061	.149	.498	.200	.159	-.211	-.177	-.050	.205	.185	.320	.226	.055	.746	.096	.111	.177	
C. Identifying future opportunities	.648	-.013	.061	.442	.402	.202	-.009	.063	-.254	.266	.212	.050	.195	.245	.798	.130	.093	-.107	Keep
D. Willingness to be nurtured within business incubators	.684	.050	.162	.389	.045	.090	.110	-.311	-.112	.273	.119	.315	.321	.224	.552	.251	-.126	.231	
Part Five: Role of Business Incubators in Supporting Entrepreneurial Practices in the UAE:																			
F10. importance of business incubator in …																			
A. Developing entrepreneurship culture	.673	-.477	-.151	-.120	.276	-.048	-.071	-.214	.126	.208	.806	.114	-.041	.223	.185	.206	.014	.170	
B. Contributing to local economy	.735	-.379	.119	-.314	.255	-.043	-.051	-.064	.071	.255	.824	.134	.252	.185	.079	.096	.004	-.022	
C. Supporting national innovation strategy in the UAE	.716	-.450	-.024	-.241	.274	-.134	-.109	-.129	-.001	.218	.850	.174	.069	.173	.136	.200	-.029	-.033	Keep
D. Nurturing entrepreneurs	.687	-.474	-.046	-.228	.370	-.065	-.121	-.028	.079	.201	.881	.061	.057	.187	.167	.137	.088	-.033	
E. Creating jobs	.632	-.404	.142	-.246	-.121	.010	-.126	.108	.121	.147	.615	.359	.206	.313	-.080	-.079	.137	-.031	
F. Commercializing new products and services	.745	-.450	.116	-.108	.014	.007	-.200	.011	.025	.155	.705	.394	.157	.297	.159	-.005	.092	-.026	
F11. Reason to choose to move into a business incubator																			
A. Competitive market rate for workstations/ office space	.494	-.504	-.072	.161	-.131	-.123	.302	.245	-.212	-.002	.265	.201	.014	.717	.096	.274	.028	-.219	
B. Facilities, services, and networking	.666	-.482	-.104	.078	-.146	.146	.130	.226	-.049	.193	.403	.264	.024	.701	.142	.022	.147	-.057	Keep
C. Fund sources	.490	-.500	-.005	.075	-.212	.397	.323	-.074	-.038	.142	.279	.147	.085	.757	.129	-.124	-.168	.220	
D. Support in creating start-ups	.618	-.500	-.236	.074	.026	.291	.209	.071	.080	.253	.464	.041	-.061	.686	.199	.008	.107	.162	

Extraction Method: Principal Component Analysis.

a. 9 components extracted.

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.