

إقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

ترتيب عوامل النجاح الحرجة للشركات المحتضنة في مجال تكنولوجيا المعلومات والاتصالات  
في غزة باستخدام عملية التحليل الهرمي (AHP)

**Prioritizing Critical Success Factors for Incubated Information and  
Communications Technology Enterprises in Gaza Using Analytical  
Hierarchy Process (AHP)**

أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة  
إليه حيثما ورد، وإن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل درجة أو لقب  
علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

**DECLARATION**

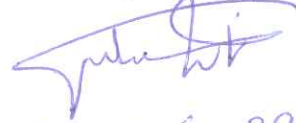
The work provided in this thesis, unless otherwise referenced, is the  
researcher's own work, and has not been submitted elsewhere for any  
other degree or qualification

Student's name:

Signature

Date:

نادر رياض عبد النبي



2015.6.29

اسم الطالب:

التوقيع:

التاريخ:

**The Islamic University- Gaza**  
**Deanship of Graduate Studies**  
**Faculty of Commerce**  
**Business Administration Department**



الجامعة الإسلامية - غزة  
عمادة الدراسات العليا  
كلية التجارة  
قسم إدارة الأعمال

**Prioritizing Critical Success Factors for Incubated  
Information and Communications Technology  
Enterprises in Gaza Using Analytical Hierarchy Process  
(AHP)**

**Prepared by:**

**Nader R. Abd El-Naby**

**Supervised by:**

**Prof. Yousif H. Ashour**

**A Thesis submitted in partial fulfillment of the requirement for MBA**

**June 2015**



## نتيجة الحكم على أطروحة ماجستير

بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ نادر رياض صبحي عبدالنبي لنيل درجة الماجستير في كلية التجارة/ قسم إدارة الأعمال وموضوعها:

ترتيب عوامل النجاح الحرجة للشركات المحتضنة في مجال تكنولوجيا المعلومات والاتصالات في غزة باستخدام عملية التحليل الهرمي (AHP)

**Prioritizing Critical Success Factors for Incubated Information and Communications Technology Enterprises in Gaza Using Analytical Hierarchy Process (AHP)**

وبعد المناقشة التي تمت اليوم الاثنين 22 شعبان 1436هـ، الموافق 2015/06/09م الساعة التاسعة والنصف صباحاً بمبنى طيبة، اجتمعت لجنة الحكم على الأطروحة والمكونة من:

.....	مشرفاً ورئيساً	أ.د. يوسف حسين عاشور
.....	مناقشاً داخلياً	د. خالد عبد دهليز
.....	مناقشاً خارجياً	أ.د. سامي سليم أبو ناصر

وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في كلية التجارة/ قسم إدارة الأعمال. واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله وئزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق ،،،

مساعد نائب الرئيس للبحث العلمي والدراسات العليا

أ.د. فؤاد علي العاجز



## **Abstract**

Small and medium enterprises (SME's) play a vital role in economic development of countries. It has been estimated that about 80 percent of world economic growth is created by SME's, but despite their significance, SMEs are faced with the threat of failure as well as success with past statistics indicating that three out five fail within the first few months. This research aims to identify and prioritize the main critical success factors affecting the Incubated Information and Communications Technology (ICT) SME's in Gaza, such factors were widely investigated through previous studies and a set of experts and managers were carefully selected to eventually choose 8 main criteria which are Human Resources, Entrepreneurs' characteristics, Financials, Products/Service Characteristics, Marketing, Incubators Roles, Environmental Conditions and Organization Characteristics with 23 associated sub-criteria has been suggested. The AHP tool was applied with the help of Expert Choice Software to achieve the goal, Results show that for the main factors ranking; Entrepreneurs' characteristics comes first with 20.9% then the Marketing factor with 19.1%, while in the sub-criteria level, Marketing and Experience get the top two ranks with 11.23% and 9.86% respectively, then, the results were modified by increasing 10% for each main criteria and then the ranks were reconsidered again. Finally, the main recommendations made by the research are to enhance the entrepreneurial skills among the students by promoting innovative ways for the education process and setting separate Marketing plans for the enterprises besides the business and financial plans

## ملخص الرسالة باللغة العربية

### عنوان الرسالة:

### ترتيب عوامل النجاح الحرجة للشركات المحتضنة في مجال تكنولوجيا المعلومات والاتصالات في غزة باستخدام عملية التحليل الهرمي (AHP)

تلعب الشركات الصغيرة والمتوسطة دوراً حيوياً في التنمية الاقتصادية للدول؛ حيث تشير التقديرات إلى أن نحو 80 في المئة من النمو الاقتصادي العالمي مناط من قبل الشركات الصغيرة والمتوسطة، لكن على الرغم من أهميتها، فإن الشركات الصغيرة والمتوسطة تواجه خطر احتمال الفشل، و النجاح أيضاً مع الإشارة إلى إحصاءات سابقة تقول إن ثلاثة من أصل خمسة شركات تفشل في غضون الأشهر القليلة الأولى من إنشائها. يهدف هذا البحث إلى تحديد وترتيب لعوامل النجاح الحرجة والرئيسية التي تؤثر على الشركات الصغيرة المحتضنة الناشئة في مجال المعلومات والاتصالات (ICT) في قطاع غزة، وقد تم استطلاع مثل هذه العوامل بدراسة معمقة من خلال الدراسات السابقة ومن ثم أخذ رأي مجموعة مختارة بعناية من الخبراء والمدراء العاملين بالمجال لاختيار 8 عوامل الرئيسية وهي: الموارد البشرية، السمات الشخصية للمبادرين، الأمور المالية، مميزات الخدمات/المنتجات، التسويق، دور حاضنات الأعمال، الظروف البيئية وأخيراً خصائص الشركة مع 23 من العوامل الفرعية المرتبطة بالعوامل الرئيسية، وتم استخدام أداة عملية التحليل الهرمي وبمساعدة البرمجيات الخاصة بتلك الأداة وهو برنامج Expert Choice لتحقيق الهدف، أظهرت نتائج الدراسة أن السمات الشخصية لرواد الأعمال تأتي في المرتبة الأولى بنسبة 20.9% ومن ثم عامل التسويق مع 19.1% هذا على مستوى العوامل الرئيسية، بينما في مستوى العوامل الفرعية؛ فكان عاملي التسويق وخبرة الرواد من أهم العوامل بنسب 11.23% و 9.86% على التوالي، وقد أجريت تحليل الحساسية على النتائج بزيادة مقدارها 10% على المعايير الأساسية وتوزيعها بالتساوي بين العوامل الفرعية ذات العلاقة لكل معيار ومن ثم ملاحظة تغير الترتيب. أخيراً، من أهم التوصيات التي قدمها البحث هو تعزيز المهارات والسمات الريادية بين الطلاب من خلال تشجيع طرق مبتكرة لعملية التعليم ووضع خطط تسويق منفصلة للشركات إلى جانب خطط الأعمال والخطط المالية.

## **Dedication**

**Especially dedicated**

**To my beloved family, Heba, Eslam and Ahmed,**

**To my dear parents, mother and father,**

**To my dear brothers, sisters and their beloved families,**

**To my dear friend Denny Cormier,**

**To my dear friends and colleagues,**

**To those who sacrifice their lives so that we might live in dignity, The Martyrs**

**To those who was robbed of their freedom so that we might live in freedom, The  
Prisoners**

**To Palestine, All Palestine**

**To all of you I dedicate this work.**

## **Acknowledgement**

I would like to express my sincere gratitude to my advisor Prof. Dr. Yousif Ashour for his supervision and guidance. I also would like to express my thanks to Prof. Mohammed Mikdad, Prof. Fares Abu Moamer and Prof. Salah Agha for their help and guidance.

I would like to express my gratitude to the experts who helped me in this research by filling the questionnaires and for their valuable time.

Last, but not least, I would like to thank my family and friends for their continuous support throughout this research.

# Table of Contents

Abstract .....	ii
ملخص الرسالة باللغة العربية.....	iii
Dedication .....	iv
Acknowledgement.....	v
Table of Contents .....	vi
List of Tables.....	x
List of Figures.....	xi
List of Appendices.....	xii
List of Abbreviations.....	xiii
Chapter One .....	1
General Background .....	1
Introduction .....	2
Problem Statement .....	4
Research Objectives .....	4
Research Questions.....	5
Research Importance .....	5
Research Motivation .....	6
Research Variables .....	7
Organization of the Reminder of the Research.....	7
Chapter Two .....	9
Literature Review .....	9
2.1 Introduction.....	9
2.2 The Entrepreneur and Entrepreneurship Definitions .....	9
2.3 Who can become an entrepreneur? .....	11
2.4 The Main Reasons for People to Become an Entrepreneur.....	12
2.5 The Entrepreneurial Process: .....	13
2.6 Business Incubation.....	15
2.7 Incubation Process .....	17
2.8 Small Business Definition .....	19
2.8.1 Small Business Size Definitions.....	20



2.8.2 Advantages of small Business.....	21
2.8.3 Disadvantages of small Business .....	22
2.9 Small business in Gaza.....	22
2.9.1 Types of Small Business in Gaza .....	23
2.9.2 The Importance of the Small Business in Gaza.....	24
2.10 ICT Enterprises in Gaza .....	25
2.10.1 “Entrepreneurs” Program: .....	25
2.10.2 Business and Technology Incubator (BTI) at the Islamic University of Gaza (IUG) .....	26
Chapter 3 .....	28
Previous Studies .....	28
3.1 Introduction.....	29
First: Qualitative studies for Critical Success Factors or Barriers/Obstacles face SME’s .....	29
“Small Enterprises Finance in Jordan – Obstacles and Challenges” .....	33
Second: Quantitative and AHP Studies .....	44
3.4 Researcher Comment on the Previous Studies .....	52
Table (3.1): Previous studies conducted in the same field in Gaza.....	53
Chapter 4 .....	55
Multi-Criteria Decision Making (MCDM) and Analytical Hierarchy Process (AHP) .....	55
4.1 Introduction.....	56
4.2 Multi-Criteria Decision Making (MCDM) .....	56
4.2.1 MCDM Steps:.....	57
4.2.2 Classification of MCDM techniques.....	57
4.3 Analytical Hierarchy Process (AHP) .....	58
4.3.1 Thomas L. Saaty.....	59
4.3.2 AHP Definition .....	60
4.3.3 Uses and applications of AHP .....	60
4.3.4 AHP Principles and Axioms .....	61
4.3.5 AHP Methodology .....	62
4.3.6 Hierarchical Structuring of the Problem.....	64
4.3.7 Performing Pair-wise Comparisons .....	64
4.3.8 Synthesis.....	66
4.3.9 Consistency Evaluation.....	66

4.3.10 AHP Applications .....	67
4.3.11 AHP Strengths and Weaknesses.....	68
4.3.11.1 Weaknesses of AHP .....	68
4.3.10.2 AHP Strengths.....	69
Chapter 5 .....	73
Methodology .....	73
5.1 Introduction.....	74
5.2 Factors (Criteria and Sub-criteria) selection.....	74
5.3 Factors Identification.....	82
5.3.1 Factors Definition .....	83
5.4 Experts Selection: .....	87
5.5 Experts Opinions and factors modifications:.....	87
Table (5.11): The experts' ratings for the suggested criteria and sub-criteria.....	89
Table (5.12): The Final Criteria and Sub-criteria.....	92
5.6 AHP Software:.....	93
Chapter 6 .....	94
Results and Analysis .....	94
6.1 Introduction.....	95
6.2 Factors Definition .....	95
Table (6.1): The final criteria and sub-criteria .....	96
6.3AHP Model Applying.....	96
6.3.1 Hierarchical structure of the problem:.....	96
6.3.2 Pair Wise Comparison Conducting: .....	97
6.3.2.1 Main criteria pair wise comparison:.....	98
6.3.2.2 Sub-Criteria Pair wise Comparison .....	100
1. Human Resources Sub-criteria .....	100
2. Entrepreneurs' Characteristics: .....	101
3. Financials: .....	103
4. Product/Service Characteristics .....	104
5. Marketing: .....	105
6. Incubators' Roles: .....	107
7. Environmental Conditions: .....	108

8. Organization Characteristics.....	109
6.4 Analysis of Results: .....	111
6.4.1 Main Criteria Ranking Analysis:.....	111
6.4.2 Sub-Criteria Ranking Analysis:.....	113
6.4.3 Inconsistency Analysis .....	117
6.4.4 Sensitivity Analysis .....	118
6.4.4.1 Entrepreneurs’ Characteristics .....	118
6.4.4.2 Marketing .....	119
6.4.4.3 Human Resources.....	119
6.4.4.4 Products/Service Characteristics.....	120
6.4.4.5 Financials .....	120
6.4.4.6 Incubators’ Roles .....	121
6.4.4.7 Environmental Conditions .....	122
6.4.4.8 Organization Characteristics .....	122
6.4.4.9 Sensitivity Analysis Summary .....	123
Chapter 7 .....	125
Conclusions and Recommendations .....	125
7.1 Introduction.....	126
7.2 Conclusions.....	126
7.3 Recommendations.....	129
References .....	132
Books .....	132
Theses.....	132
Published Papers .....	133
Articles, Reports and Documents .....	135
Websites .....	137
Appendices .....	139
Appendix A: ICT Startups Critical Success Factors Questionnaire.....	139
Appendix B: ICT Startups Critical Success Factors Pair-wise Comparison Questionnaire .....	143
ICT Startups Critical Success Factors Pair-wise Comparison Questionnaire .....	143
Appendix C: Experts background and information .....	148

## **List of Tables**

- Table (3.1): Business size definition in Australia, US and EU
- Table (4.1): Saaty's Scale of Importance Intensities
- Table (4.2): Random Consistency Index (RI).
- Table (4.3): Pros and Cons of AHP
- Table (5.1): Previous Studies' Factors (Barriers/Success Factors):
- Table (5.2): The Main Criteria and sub-criteria adopted by the researcher
- Table (5.3): Human Resources sub-criteria interview questions
- Table (5.4): Entrepreneurs' characteristics sub-criteria interview questions
- Table (5.5): Financials sub-criteria interview questions
- Table (5.6): Product/Service characteristics sub-criteria interview questions
- Table (5.7): Product/Service characteristics sub-criteria interview questions
- Table (5. 8): Incubator roles sub-criteria interview questions
- Table (5. 9): Policy and Policies sub-criteria interview questions
- Table (5. 10): Organization Characteristics sub-criteria interview questions
- Table (5.11): The experts' ratings for the suggested criteria and sub-criteria
- Table (5.12): The Final Criteria and Sub-criteria
- Table (6.1): The final criteria and sub-criteria
- Table (6.2): Main Criteria Weights and Cumulative percentage
- Table (6.3): The global weights of sub-criteria
- Table (6.4): The prioritized sub-criteria with its corresponding main criterion
- Table (6.5): Entrepreneurs' Characteristics Sensitivity Analysis
- Table (6.6): Marketing Sensitivity Analysis
- Table (6.7): Human Resources Sensitivity Analysis
- Table (6.8): Product/Services Characteristics Sensitivity Analysis
- Table (6.9): Financials Sensitivity Analysis
- Table (6.10): Incubators' Roles Sensitivity Analysis
- Table (6.11): Environmental Conditions Sensitivity Analysis
- Table (6.12): Organization Characteristics Sensitivity Analysis
- Table (6.13): Sensitivity Analysis Summary
- Table (7.1): Sub Criteria Ranking Results
- Table (7.2): Main Criteria Ranking Results

## **List of Figures**

- Fig. (1.1): Research Methodology adopted by the researcher.
- Fig. (2.1): Model of entrepreneurial motivation and the entrepreneurship process
- Fig. (2.2): Evolution of the Business Incubator Model
- Fig. (2.3) Business Incubation Model
- Fig. (4.1): AHP methodology (adopted by researcher)
- Fig. (4.2): AHP Hierarchy (Saaty, 1980)
- Fig. (6.1): Hierarchal structure of the AHP model by EC Software
- Fig. (6.2): Main Criteria Pair Wise Comparison Results
- Fig. (6.3): Main Criteria Pair Wise Comparison normalized percentage
- Fig. (6.4): Human Resources sub-criteria Pair Wise Comparison
- Fig. (6.5): the normalized results of the Human Resources sub-criteria
- Fig. (6.6): Entrepreneurs' characteristics sub-criteria Pair Wise Comparison
- Fig. (6.7): normalized results of the Entrepreneurs' Characteristics sub-criteria
- Fig. (6.8): Financing sub-criteria Pair Wise Comparison
- Fig. (6.9): normalized results of the Financing sub-criteria
- Fig. (6.10): Product/Service Characteristics sub-criteria Pair Wise Comparison
- Fig. (6.11): normalized results of the Product/Service Characteristic sub-criteria
- Fig. (6.12): Marketing sub-criteria Pair Wise Comparison
- Fig. (6.13): normalized results of the Marketing sub-criteria
- Fig. (6.14): Incubators' Role sub-criteria Pair Wise Comparison
- Fig. (6.15): normalized results of the Incubators' Role sub-criteria
- Fig. (6.16): Environmental Conditions sub-criteria Pair Wise Comparison
- Fig. (6.17): Normalized results of the Environmental Conditions sub-criteria
- Fig. (6.18): Organization Characteristics sub-criteria Pair Wise Comparison
- Fig. (6.19): Normalized results of the Organization Characteristics sub-criteria
- Fig. (6.20): Bar chart shows the main criteria comparison results and cumulative percent
- Fig. (6.21): The inconsistency ratios for all 23 sub-criteria

## **List of Appendices**

Appendix A: ICT Startups Critical Success Factors Questionnaire.

Appendix B: ICT Startups Critical Success Factors Pair-wise Comparison Questionnaire.

Appendix C: Experts background and information.

## **List of Abbreviations**

AHP	Analytical Hierarchy Process
BI	Business Incubation
BTI	Business and Technology Incubator
CI	Consistency Index
CR	Consistency Ratio
CSF's	Critical Success factors
EC	Expert Choice
GDP	Gross Domestic Product
HR	Human Resources
ICT	Information and Communications Technology
ILO	International Labor Organization
INGO's	International Non-Governmental Organizations
IT	Information Technology
IUG	Islamic University of Gaza
LP	Linear Programming
MCAL	Multi Choice Aspiration Level
MCDA	Multi Criteria Decision Analysis
MCDM	Multi Criteria Decision Making
MODM	Multi Objective Decision Making
MOGP	Multi Objective Goal Programming
NBIA	National Business Incubation Association
NGO's	Non Governmental Organizations
PCBS	Palestinian Central Bureau of Statistics
PICTA	Palestinian Information and Communications Technology Association
PICTI	Palestinian Information and Communications Technology Incubator
SBA	Small Business Administration
SMART	Simple Multi Attribute Rating Technique
SME's	Small and Medium Enterprises
UNDP	United Nations Development Program
UNRWA	United Nations Relief and Works Agency

# **Chapter One**

## **General Background**

**Introduction**

**Problem Statement**

**Research Questions**

**Research Objectives**

**Research Importance**

**Research Motivation**

**Research Limitation**

**Research Variables**

**Organization of the Rest of the Research**



## **Introduction**

The Palestinian economy is very weak and depends heavily on external funding. The economic situation in Gaza Strip is much worse, and its environment is not attractive to external investors due to its political situation and due to constant harmful intervention from the Israeli occupation (Dahleez, 2009).

Gaza Strip has been exposed to different economic crises, which caused negative impacts on the Palestinian economic sectors in general and on the Information and Communications Technology (ICT) sector in particular. The Palestinian economy moved from one crisis to another, which increased the negative effects on the overall economy. The severe crises started with the tight siege in 2007.

While the dependence of modern economic development on new business is widely acknowledged, the role of new exporting high-tech businesses in the Gaza strip is seen as more vital and important. Since ICT or high-tech Small and Medium Enterprises (SME's) create and implement technological innovations, which increase the efficiency, productivity and optimize the exploitation of the already scarce resources, additionally they play an important role in economic development by creating additional jobs for new graduates, and they improve living standards. The most noticeable and important feature of the ICT sector SME's is that they overcome the bad economic situation that has been imposed on Gaza Strip since 2007 by the Israeli siege, a siege that has impeded the movement of goods and individuals with the constant closure of the Rafah and Beit Hanoun "Eretz" crossings, the only two windows for the people of Gaza to the outside world. In spite of the siege, where blockades the movement of goods and individuals ICT startups can easily reach global markets via the World Wide Web, the Internet, so ICT can be seen as the vehicle to the outside world under the tight Israeli siege.

According to the Palestinian Central Bureau of Statistics (PCBS) and its press release on the results of the Labor Force Survey for the recent round, second quarter (April– June, 2014) - the unemployment rate in Gaza Strip increased from 40.8% in the 1<sup>st</sup> quarter 2014 to 45.1% in the 2<sup>nd</sup> quarter 2014; and the gap in the participation rate

between males and females in Palestine is still very large. It reached 71.7% for males compared with 19.4% for females (PCBS, 2014).

Given this 45.1% unemployment percentage in Gaza Strip (PCBS, 2014), it reinforces the importance of high-tech enterprises on two levels. On the one hand, it allows the graduates (computer engineers, computer science, Information Technology (IT) and faculty of commerce students aged 20-25) to start their own businesses and trading without the limitations of the siege or the bad political situation in Gaza. Additionally, it provides great opportunities for female graduates, who suffer more from unemployment, to start generating income while working at home on their laptops or computers. This overcomes the reality of cultural norms that dictate females not to work outside the home, in addition to the highly competitive job market where employers often prefer males over females.

Starting and operating a small business includes the possibility of success as well as failure. Because of its small size, a simple management mistake is likely to lead to certain death with no opportunity to learn from past mistakes. Lack of planning, improper financing and poor management have been posited as the main causes of failure of small enterprises. Lack of credit is also identified as one of the most serious constraints facing SME's in all sectors, especially the ICT sector, hindering their development (Al-Shaqra and Barakat 2013).

High-technology industries are mainly characterized by growing turbulence, and time and information-intensive environments. A model which determines the relative importance of factors affecting high-tech SME's success would be valuable. Obviously, it is a significant concern for the managers of such companies to find the means to survive and succeed in such a turbulent and competitive environment. Also because of the role that these companies play in achieving an innovative and progressive economy, success of these companies is very important for governments as well (Sadeghi et al, 2012).

The purpose of this research is to find out the critical success factors related to the SME's working in ICT sector in Gaza and to prioritize these factors. Based on the fact that the factors affecting high-tech SME's success should be measured jointly and not

separately, in this study, Multi-Criteria Decision Making (MCDM) will be used and an AHP approach, which allows for multi-criteria and simultaneous evaluation.

## **Problem Statement**

Gaza Strip has a large number of university students and graduates in different fields of specialization. Some of them offer important, innovative and applicable ideas, which can serve as development tools for supporting the weak Palestinian economy (Dahleez, 2009). And they can also be utilized to reduce unemployment which is the highest worldwide (45.1%). These entrepreneurial ideas demonstrate a high potential for success if they acquire both logistical and financial support; but entrepreneurs don't always have the opportunity to earn their incomes from their start-ups because of obstacles which prevent them from achieving their goals. Taking into consideration that there are no quantitative studies dealing with SME's working in this vital sector which witnessed the second highest growth percentage in 2012 according to Performance of the Palestinian Economy, 2012. this research asks the most critical question to deal with that issue: **What are the main critical success factors, main criteria and sub-criteria, that can contribute significantly in the success of the ICT enterprises in order to making real change for high-tech sector in Gaza?**

## **Research Objectives**

The main objective of this study is to prioritize the main critical success factors (CSF's) for incubated information and communications technology enterprises in Gaza using AHP.

The study also includes the following sub-objectives:

1. To determine the criteria that can be used as a basis for ranking and prioritizing ICT enterprises CSF's according to their importance to the Gaza Strip.
2. To determine the sub-criteria that contributes to the success of each criteria.
3. By using the science of MCDM techniques, which is AHP, to get a rank of the critical success factors for incubated ICT enterprises in Gaza according to experts and previous global studies criteria.

## **Research Questions**

This research will answer the following questions:

1. What are the main Critical Success Factors (CSF's) which significantly affect small and medium-enterprises (SME's) in the Information and Communication Technology (ICT) sector or the high-tech sector operating within Gaza City?
2. What are the sub-criteria associated to the main criteria which contribute to the success of each factor?
3. What is the rank of these CSF's – The most important to the least important?
4. By increasing 10% to the weights of the main criteria and the associated sub-criteria, what are the new rank of the main and the sub-criteria?
5. What recommendations can be offered to enhance the survival rate for the entrepreneurs and entrepreneurship working in the ICT sector?

## **Research Importance**

The importance of this research lies in its selecting a topic that is vital to the society in the Gaza Strip in general and to the Palestinian economy in specific.

This research will help the managers and experts working in the ICT field to focus more in certain critical areas which significantly lead to the success of the incubated ICT startups more effectively and efficiently, in the other hand, it will guide the new entrepreneurs to the most critical factors which contribute heavily in the success of their startups, so it could serve as a road map in the planning and establishing process of the ICT startups.

Moreover, this research support the importance of a previously qualitative study conducted in the Gaza Strip (Dahleez, 2009) to help decision makers at academic institutions to implement major changes in academic planning to develop entrepreneurial skills among their graduates as well as the other complementary skills required for establishing new ICT startups. In addition to assist decision and policy makers in formal and informal institutions to adopt a model of business incubation that is most suitable for Gaza Strip ICT startups, based on AHP quantitative tool implemented in other countries.

It provides a detailed survey of Palestinian entrepreneurs, additionally, the research results and conclusions will assist international donors and supporters of the Palestinian economy to utilize and direct their funds toward sustainable economic development - encouraging new business and creating new jobs.

Finally, to the best of our knowledge, no research that focuses on identifying and prioritizing the Critical Success Factors (CSF) has been carried out in Palestine, or at least in the Gaza Strip, to date.

## **Research Motivation**

The primary motivation for this study can be explained in the following points:

- Significant failure percentage in Small and Medium Enterprises in general and ICT enterprises in specific.
- Lack of quantitative studies deal with ICT or high-tech enterprises.
- Lack of easy-to-use quantitative models.
- Researcher works in the field and has easy access to different sources of data.
- New trends for the donors to enhance and support youth in creating their own businesses.
- High unemployment rate among university graduates, computer and electrical engineers, computer science, IT and faculty of commerce students.

## **Research Limitations**

Giving that the entrepreneurship is considered a new field in Gaza and there is still scarcity in experts in this field, it is going to be very hard to conduct a classical statistical study because of the small sample size no., moreover, and for the same reasons, the research will be conducted in Gaza city but it will be considered to cover Gaza Strip since the incubators in Gaza city contains entrepreneurs from different cities of the Gaza Strip.

On the other hand, through the research, the SME's phases were treated as one phase, since it is relatively difficult to examine the CSF's for each phase in particular.

## **Research Variables**

The research variables, critical success factors, that may affect the success of the incubated ICT enterprises in Gaza are a set of criteria and main criteria which will be investigated in the Methodology chapter later in the research, but they can be generalized as follows:

1. Human Resources
2. Entrepreneurs' Characteristics
3. Organization Characteristics
4. Financials.
5. Product/Service Characteristics.
6. Policy and Policies.
7. Market Characteristics.
8. Incubators.

## **Organization of the Reminder of the Research**

The rest of the research is organized as follows: chapter two tackles the literature review which takes in details the entrepreneurship, entrepreneurs and small businesses in Gaza, then chapter three reviews 17 qualitative studies for critical success factors or barriers and 15 quantitative and AHP studies. Chapter four details the process of Multiple Criteria Decision Making (MCDM) and the AHP process, definition, founder, uses and applications, strengths and weaknesses, Chapter five tackles the methodology and the factors selection process, previous studies review, first questionnaire, and second questionnaire, experts selection and the software used, while Chapter six examines the results and the discussion of results a long with three levels of analysis, main criteria analysis, sub criteria analysis and consistency analysis and then the sensitivity analysis, Finally chapter seven and eight mentions the Conclusions and Recommendations respectively according to the main findings of the research.

## **Chapter Two**

### **Literature Review**

#### **2.1 Introduction**

#### **2.2 The Entrepreneur and Entrepreneurship Definitions**

#### **2.3 Who can become an entrepreneur?**

#### **2.4 The Main Reasons for People to Become an Entrepreneur**

#### **2.5 The Entrepreneurial Process**

#### **2.6 Business Incubation**

#### **2.7 Incubation Process**

#### **2.8 Small Business Definition**

##### **2.8.1 Small Business Size Definitions**

##### **2.8.2 Advantages of Small Business**

##### **2.8.3 Disadvantages of Small Business**

#### **2.9 Small business in Gaza**

##### **2.9.1 Types of Small Business in Gaza**

##### **2.9.2 The Importance of the Small Business in Gaza**

#### **2.10 ICT Enterprises in Gaza**

##### **2.10.1 “Entrepreneurs” Program**

##### **2.10.2 Business and Technology Incubator (BTI) at the Islamic University of Gaza (IUG)**

# **Chapter Two**

## **Literature Review**

### **2.1 Introduction**

This chapter introduces valuable information about entrepreneur and entrepreneurship, who can become an entrepreneur? And the main reasons why people prefer to be entrepreneurs. Additionally, it describes the entrepreneurial process, the business incubation and the incubation process main stages and progress over time. It also tackles the small business with the definitions, the size, sectors, advantages and the disadvantages; finally, it takes the Small Business, ICT sector and the main incubators in Gaza.

### **2.2 The Entrepreneur and Entrepreneurship Definitions**

The concept of entrepreneurship was first established in the 1700s, and the meaning has evolved ever since. Many researchers simply equate it with starting one's own business. Most economists believe it is more than that.

To some economists the word entrepreneur is derived from the French words "entre" meaning "between," and prendre, meaning "to take". The word was originally used to describe people who take on the risk between buyers and sellers or who undertake a task such as starting a new venture. Others define it as a person who owns or starts an organization, such as a business, or anyone who owns a business is an Entrepreneur.

Small business owner, entrepreneur and self-employed are used interchangeably. Donald F. Kuratko defines the entrepreneur as one who undertakes to organize, manage, and assume the risk of a business. Others emphasize the entrepreneur's role as an innovator who markets his innovation. Still other economists say that entrepreneurs develop new goods or processes that the market demands and are not currently being supplied (Dahleez, 2009).

An entrepreneur is defined as a person who organizes, manages, and assumes the risks of running a business or enterprise. Saint Louis University entrepreneurship professor, Jerome Katz, identifies four basic categories of entrepreneurship: corporate,



social, public, and independent. A corporate entrepreneur is someone who develops new products, services or markets for a company, like Jonathan Ives, inventor of the iPod for Apple. A social entrepreneur is someone who develops charities and nonprofits which do good for others in ways which are economically self-sustaining, like Bangladesh's Muhammad Yunus, who created the Grameen Bank and won the 2007 Nobel Peace Prize for his efforts in developing microloans and other programs to help the poor. A public entrepreneur is someone who works in government to help make it more responsive to citizens and more efficient in meeting its goals, like longtime New York Deputy Mayor Herbert Sturz, who developed innovative ways to improve low-income housing and promote criminal justice reform (Entrepreneurship: Beyond the Lemonade Stand, 2008).

Also the word entrepreneurship has many definitions. One of them the definition of Bruce R. Barringer and R. Duance Ireland who are defining it as the process by which individuals pursue opportunities without regard to resources they currently control. This definition is reflecting the nature of the entrepreneurship in which individuals seek opportunities then choose the most suitable one for their interest and turn these opportunities into reality by best utilizing of the available resources. (Kaufmann and Dant, 1998) classified the definitions of entrepreneurship based on different viewpoints as found in the literature. They cited three main trends, namely: first are the entrepreneurs oriented definitions by stressing the characteristic traits or qualities supposedly possessed by entrepreneurs including risk taking, leadership, motivation, ability to resolve crises, creativity, low level of risk aversion, decision making ability and more. Second are the entrepreneurial process oriented definitions by stressing the process of entrepreneurship and its result including the creation of new enterprise, introduction of new combinations of production factors and new, unique and valuable combinations of resources in an uncertain and ambiguous environment. Third are entrepreneurial activities oriented definitions by focusing on the activities entrepreneurs perform including connecting to new markets, overcoming market deficiencies, creating and managing contractual arrangements and input transforming structures, supplying resources lacking in the marketplace, activities to initiate, maintain and develop profit oriented business, to fill currently unsatisfied needs and to take operational control of the organization.

To conclude, nowadays, we can define entrepreneur as an innovator, originator or developer who organizes and seize opportunities, converts those opportunities into marketable ideas; adds value through time, effort, money, or skills; assumes the risks of the competitive marketplace to implement these ideas, and realizes the rewards from those efforts. The researcher adopts the last definition as a comprehensive and well-defined for the entrepreneur.

In almost all of the definitions of entrepreneurship, there is an agreement that we are talking about a kind of behavior that includes: (1) imitative taking, (2) the organizing and reorganizing of social and economic mechanisms to turn resources and situations to practical account, (3) the acceptance of risk and failure. (Dahleez, 2009)

### **2.3 Who can become an entrepreneur?**

There is no one definitive profile. Successful entrepreneurs come in various ages, income levels, gender, and race. They differ in education and experience. But research indicates that most successful entrepreneurs share certain personal attributes, including: creativity, dedication, determination, flexibility, leadership, passion, self-confidence, and smarts and each one of those characteristics can be defined as the following:

**Creativity** is the spark that drives the development of new products or services or ways to do business. It is the push for innovation and improvement. It is continuous learning, questioning, and thinking outside of prescribed formulas.

**Dedication** is what motivates the entrepreneur to work hard, 12 hours a day or more, even seven days a week, especially in the beginning, to get the endeavor off the ground. Planning and ideas must be joined by hard work to succeed. Dedication makes it happen.

**Determination** is the extremely strong desire to achieve success. It includes persistence and the ability to bounce back after rough times. It persuades the entrepreneur to make the 10th phone call, after nine have yielded nothing. For the true entrepreneur, money is not the motivation. Success is the motivator; money is the reward.

**Flexibility** is the ability to move quickly in response to changing market needs. It is being true to a dream while also being mindful of market realities. A story is told about an entrepreneur who started a fancy shop selling only French pastries. But customers

wanted to buy muffins as well. Rather than risking the loss of these customers, the entrepreneur modified her vision to accommodate these needs.

**Leadership** is the ability to create rules and to set goals. It is the capacity to follow through to see that rules are followed and goals are accomplished.

**Passion** is what gets entrepreneurs started and keeps them there. It gives entrepreneurs the ability to convince others to believe in their vision. It can't substitute for planning, but it will help them to stay focused and to get others to look at their plans.

**Self-confidence** comes from thorough planning, which reduces uncertainty and the level of risk. It also comes from expertise. Self-confidence gives the entrepreneur the ability to listen without being easily swayed or intimidated.

**Smart** consists of common sense joined with knowledge or experience in a related business or endeavor. The former gives person good instincts, the latter, expertise. Many people have smarts they don't recognize. A person who successfully keeps a household on a budget has organizational and financial skills. Employment, education, and life experiences all contribute to smarts. Every entrepreneur has these qualities in different degrees. But what if a person lack or more? Many skills can be learned. Or, someone can be hired who has strengths that the entrepreneur lacks. The most important strategy is to be aware of strengths and to build on them (Principles of Entrepreneurship).

## 2.4 The Main Reasons for People to Become an Entrepreneur

Being an entrepreneur can be one of the best decisions you will ever take in life but you don't just jump into things without knowing why, this post will be listing 3 main reasons why you should be an entrepreneur.

- **To Be Their Own Boss:** the first of these reasons being one's own boss. This reason is given most commonly many entrepreneurs want to be their own boss because either they have had a long time ambition to own their own firm or because they have become frustrated working in traditional jobs. This was felt to afford participants the opportunity to make their own decisions, to be responsible for their own destiny, and to be rewarded for their own efforts.
- **Pursue their own ideas:** the second reason people start their firms is to pursue their own ideas. Some people when they recognize ideas for new products or

services, they have a desire to see those ideas realized. Some employees choose to leave the firm employing them in order to start their own business as the means to develop their own ideas.

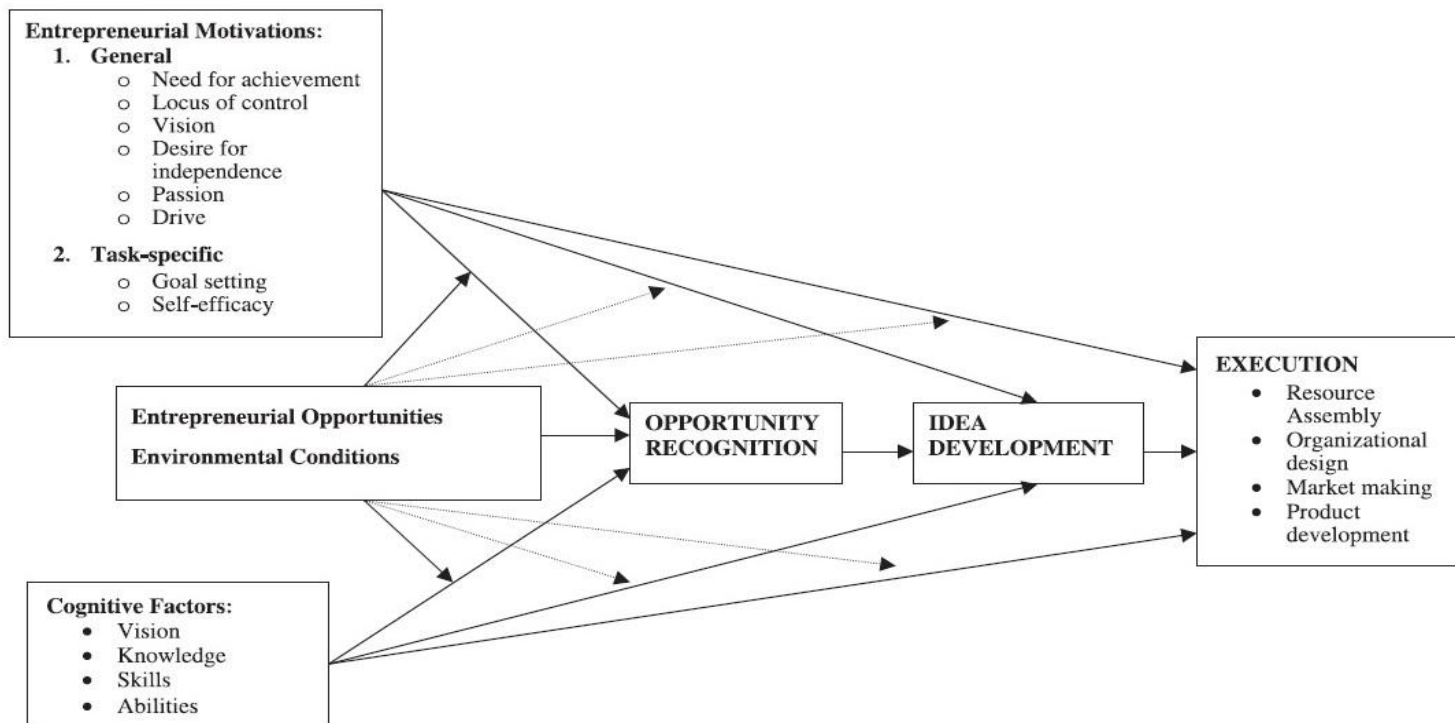
- **Pursue financial rewards:** finally people start their own firm to pursue financial rewards. This reason is a secondary to the first two and often fails to live up to its hype. The average entrepreneur does not make more money than someone with a similar amount of responsibility in a traditional job. (Alshaqra and Barakat, 2013)

## **2.5 The Entrepreneurial Process:**

The entrepreneurship process begins with an innovative idea for a new product, process, or service, which is refined as you think it through.

Entrepreneurship involves human agency. The entrepreneurial process occurs because people act to pursue opportunities. People differ in their willingness and abilities to act on these opportunities because they are different from each other. We argue that the variation among people in their willingness and ability to act has important effects on the entrepreneurial process (Entrepreneurial Motivation Report, 2003).

As shown in figure 2.1, in order to have a complete entrepreneurial process, we need an opportunity in suitable conditions. The opportunity will lead to an applicable idea if the interested person or team has the entrepreneurial motivation and cognitive factors. First, the entrepreneurs need to have some knowledge, especially of the industry and of any relevant technology that is critical to success. They can hire people with certain specialized skills that they lack, but they must possess enough expertise to know that they are doing the right thing. Second, the entrepreneur must have skills. The necessary skills will depend on the circumstances, but they may include such factors as selling and bargaining, leadership, planning, decision making, problem solving, team building, communication, and conflict management. Third, the entrepreneur needs to have the requisite abilities, including intelligence. Possessing the necessary KSAs enables the entrepreneurs to develop a viable vision, including a strategy for the organization and to carry it out successfully. Motivation helps the entrepreneur to acquire such KSAs in the first place and provide the impetus and energy to implement the needed actions. (Shane et al, 2003)



**Fig.(2.1): Model of entrepreneurial motivation and the entrepreneurship process**

**(Source: Shane et al, 2003)**

An entrepreneur must find, evaluate, and develop an opportunity by overcoming the forces that resist the creation of the something new. The process has four distinct phases: (a) identification and evaluation of the opportunity, (b) development of the business plan, (c) determination of the required resources, and (c) management of the resulting enterprise. Although these phases proceed progressively, none is dealt with in isolation or is totally completed before factors are being dealt with in a sequential phase.

Shane et al (2003) argued that entrepreneurship is a process that begins with the recognition of an entrepreneurial opportunity and is followed by the development of an idea for how to pursue that opportunity, the evaluation of the feasibility of the opportunity, the development of the product or service that will be provided to customers, assembly of human and financial resources, organizational design, and the pursuit of customers.

Furthermore, environmental conditions matter. First, opportunities may interact in interesting ways with the attributes of people. Second, as much of the macro level research has shown, the willingness to engage in entrepreneurial activities depends on

such things as the legal system of the country in which the entrepreneur operates, the age of the industry, the availability of capital in the economy (and to the industry in particular), the condition of capital markets, and the state of the overall economy. We believe that these factors are important, but that it might also be interesting to know whether motivations of particular people lead to different types of entrepreneurial action under different environmental conditions. (Shane et al, 2003)

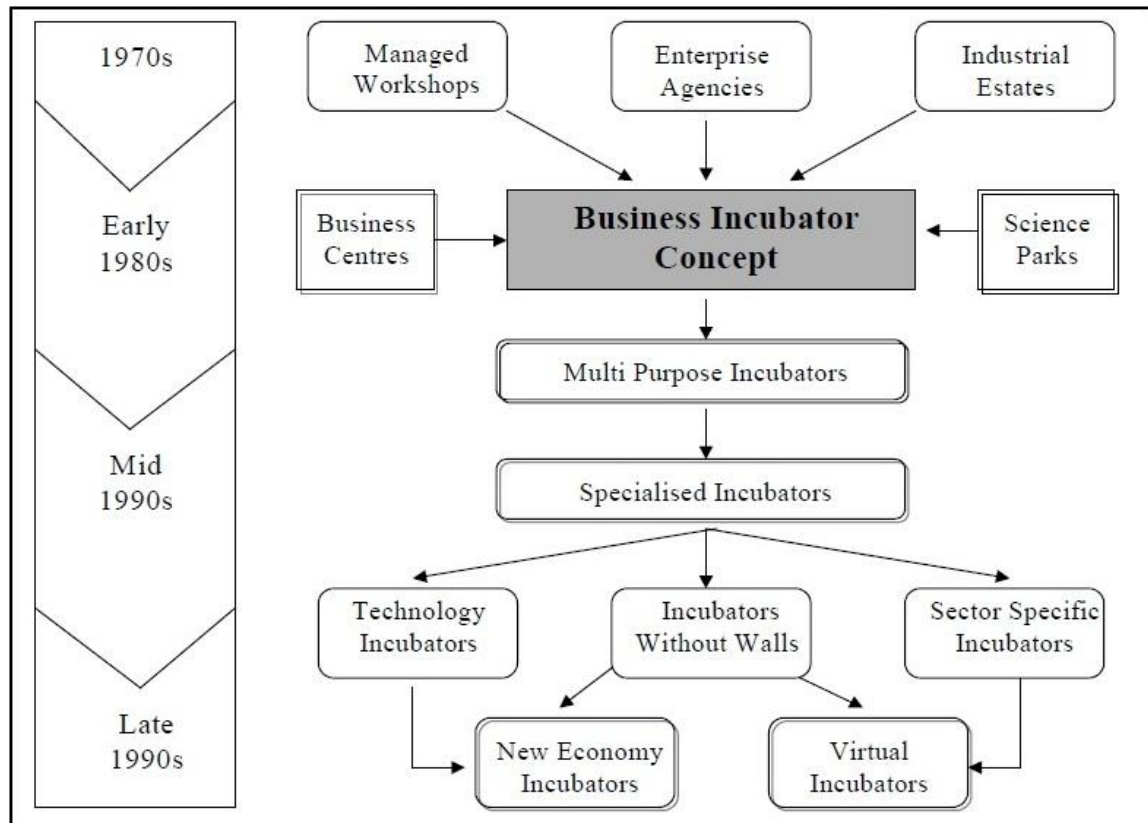
## **2.6 Business Incubation**

Business incubation is a well-known technology for assisting the creation, survival and growth of new businesses (entrepreneurship) through providing integrated packages of business developments services. The cultural concept of entrepreneurship is not a universal concept and its definition and cultural relevance varies by country (Robinson, 2008).

The National Business Incubation Association (NBIA) of the United States defines business incubation as business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its network of contacts. A business incubator's main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator graduates have the potential to create jobs, revitalize neighborhoods, commercialize new technologies, and strengthen local and national economies. (NBIA 2012).

As can be inferred from figure 2.2, A business incubator is a shared office space facility that seeks to provide its clients (i.e., "portfolio" or "client" or "tenant companies") with a strategic, value-adding intervention system (i.e., business incubation) of monitoring and business assistance. The incubator can control and link resources that assist in the development of its clients' new ventures, and simultaneously helps contain the cost of their potential failure. Additionally, they offer the following corollary: United Kingdom Business Incubation defines business incubation as a unique and highly flexible combination of business development processes, infrastructure and people designed to

nurture new and small businesses by helping them to survive and grow through the difficult and vulnerable early stages of development (Harman and Read, 2003).



**Fig.(2.2): Evolution of the Business Incubator Model**

*Source: (European Commission Enterprise Directorate General Benchmarking of Business Incubation)*

The above definition focuses on the "process" rather than on a "facility." It captures the notion of providing a supportive environment for new companies, much in the same context as the original incubator has done in the life sciences. The difference is that the nurturing environment necessary to hatch new companies depends more on a process and services than on the physical environment.

Other famous definitions from formal organizations working in the field and supporting incubation initiatives worldwide offers inclusive definitions: incubator is a physical location that provides a defined set of services to individuals or small companies. This may include specific types of office space, flexible lease terms, access to technology, financing, and technical assistance (such as marketing, legal, finance, HR, and other business development services). By locating similar or complementary entities

in proximity to each other, the incubator may also play a critical role in promoting knowledge transfer, both formally and informally (O'Neal, 2005).

It can be summarized that business incubation is the process of supporting entrepreneurs through providing them an integrated packages of business development services such as: working space, business assistance, coaching, business and technical training, matchmaking, and networking in order to ensure the success of incubated tenants through removing the business barriers and enhancing the sustainability of the these businesses.

## **2.7 Incubation Process**

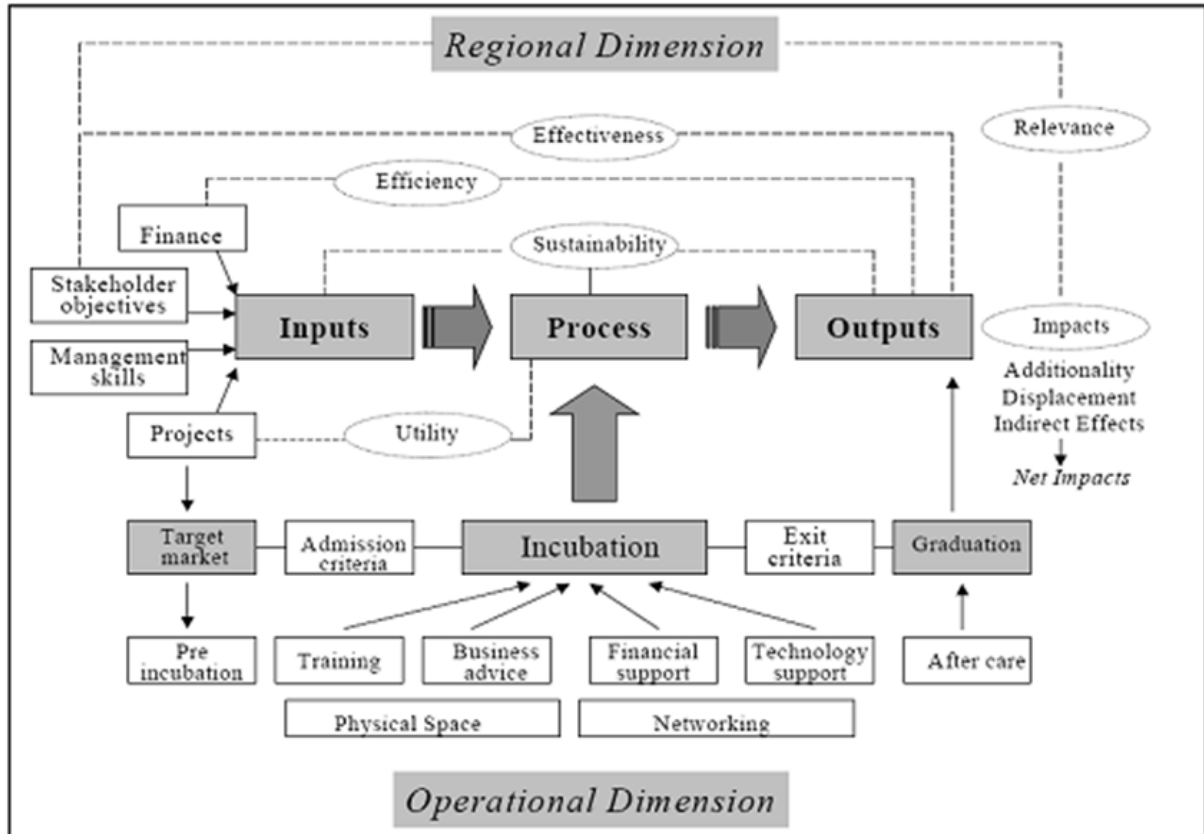
The concept/model of incubation should also be clearly identified and be consistent with the objectives the incubator wants to achieve. In the preparatory analysis, the \_incubation processes- in terms of objectives, targets, services, and deliverables – should be clearly identified. Incubation models should be considered in accordance with the country's private sector development status and needs. Successful models and governance systems should also be analyzed in order to select the approach better fitting the initiative's goals, mandate, and operational capabilities. The long-term sustainability of the incubator should also be considered key in the strategic planning of the incubator (Scaramuzzi, 2002).

The way in which business incubators operate can be depicted in terms of a simple input-output model (Centre for Strategy & Evaluation Services, 2002):

- Inputs – these mainly consist of the inputs made by stakeholders (e.g. providing finance), management resources, and projects put forward by entrepreneurs;
- Processes – the various inputs are brought together in the business incubation process through the provision of incubator space and other services to companies;
- Outputs – successful companies graduate with positive job and wealth creation impacts on local economies.

The diagram below sets out the model in schematic format, combining the incubator input-output dimension (shown in the bottom half of the diagram) together with key best practice issues (shown in the top half of the diagram).





**Fig. (2.3) Business Incubation Model**

*Source: (Costa-David, Malan, and Lalkaka, 2002)*

The report made by the European Commission, in figure 2.2 (European Commission, 2002) presents an incubation model that includes the elements necessary for the generation and development of the incubated+3 companies. This model is described from the simple process of entry-exit:

1. Entry: consists mainly of the entry made by the stakeholders (e.g., financial resources), management resources and projects presented by entrepreneurs.
2. Process: the various entries are conciliated in the incubation process through the supply of physical space and other services to companies.
3. Exits: successful graduated companies, which produce a positive impact on the local economy in terms of employment and development.

Taking the operational dimension, projects are identified that meet the criteria used to define the incubator's broad target market (e.g. projects with a particular technology focus). Some entrepreneurs may be encouraged to go through a pre-incubation process, typically involving a combination of training and business planning, before they gain

admission to the incubator. The incubation process itself typically brings together three categories of business support services – training, advice on business issues, financial support (either from an incubator’s own sources or from external providers, i.e. financial institutions), and technology support. The provision of incubator units and networking (internally between tenants and externally with other organizations, e.g. universities, large companies) constitute the other basic features of the ‘package’. A key feature of incubators is the limited duration of assistance with exit criteria typically specifying that firms should graduate after a fixed period of time (e.g. five years). Some firms will of course leave sooner if they grow rapidly and require more space than the incubator can provide. However, in many cases, contact will be retained with graduate companies through the provision of after-care services and/or on-going networking. (Costa-David et al, 2002)

## **2.8 Small Business Definition**

The term small business defies easy definition. Locally owned and operated restaurants and hair salons are small businesses, and giant corporations such as Sony, Caterpillar, and Eastman Kodak are big business. Between these two extremes, though, fall thousands of companies that cannot be easily recognized.

The U.S. department of Commerce considers a business small if it has fewer than 500 employees. The U.S. small Business Administration (SBA) a government assistance agency regards some companies with 1,500 employees as small. The SBA relies on two different factors: (1) number of employees. (2) Total annual sales. Manufactures may be small according to the first criterion, and grocery stores may be small according to the second.

Although an independent grocery store with \$15 million in sales may sound large, the SBA sees it as small when comparing its revenues to those of truly large food retailers such as Kroger and Albertson’s.

Because it’s sometimes hard to deal in strictly numerical terms, we define a small business as one that is independently owned and managed and does not dominate its market. A small business, then, cannot be part of another business and must have relatively little influence in its market. Dell computer was a small business when founded

by Michael Dell in 1984, but today it is no. one in the personal computer market and is not small in any sense of the term (Griffen R. et al, 2006).

The world cares about small businesses because they play a role in economic activity, the estimated proportion of small businesses around the world about 90% and it is the most projects offer jobs for labor forces. (ICF Jobs Study, 2013).

### **2.8.1 Small Business Size Definitions**

The legal definition of "small business" varies by country and by industry. In the United States the Small Business Administration establishes small business size standards on an industry-by-industry basis, but generally specifies a small business as having fewer than 250 employees for manufacturing businesses and less than \$7 million in annual receipts for most non manufacturing businesses. The definition can vary by circumstance – for example, a small business having fewer than 25 full-time equivalent employees with average annual wages below \$50,000 qualifies for a tax credit under the health care reform bill Patient Protection and Affordable Care Act.

The European Union generally defines a small business as one that has fewer than 50 employees. However, in Australia, a small business is defined by the Fair Work Act 2009 as one with fewer than 15 employees. By comparison, a medium sized business or mid-sized business has less than 500 employees in the US, and fewer than 200 in Australia.

In addition to number of employees, other methods used to classify small companies include annual sales (turnover), value of assets and net profit (balance sheet), alone or in a mixed definition. These criteria are followed by the European Union, for instance (headcount, turnover and balance sheet totals). Small businesses are usually not dominant in their field of operation.

**Table (3.1): Business size definition in Australia, US and EU**

	<b>Australia</b>	<b>US</b>	<b>EU</b>
<b>Minute/Micro</b>	1-2	1-6	<10
<b>Small</b>	<15	<250	<50
<b>Medium</b>	<200	<500	<250
<b>Large</b>	<500	<1000	<1000
<b>Enterprise</b>	>500	>1000	>1000

### **2.8.2 Advantages of small Business**

A business is considered a start-up if an entrepreneur begins a business based on a unique idea and takes it all the way from the planning stage to actually running the business. The business is usually thought of as still in the start-up stage until it begins to produce sufficient revenue or sales to cover the cost of supplies and operating costs. So there are some advantages for the small business as the following:

- Creativity can play a big part in starting and operating the business.
- There are no predetermined formulas or rules to follow; much less restrictive than a franchise or business opportunity purchase.
- The owner is in control of all aspects of the business, including the location and what the operation is to look like.
- The entrepreneur may draw from previous job experience, skills, and passion in establishing the business.
- The business is managed directly and effectively by the owners.
- Holds the personal character as the relationship between the workers and the owner is almost very close and they know each other.
- Depending heavily on self and internal sources of financing the project.
- Limited activity of the business annually.
- Limited profits and total funds invested.
- The number of employees in the project is low.

### **2.8.3 Disadvantages of small Business**

The disadvantages of small business can be summarized as follows:

- Start-up businesses are typically more costly and risky since there is no proven formula.
- In order to obtain capital to fund the business, a lengthy detailed business plan must be put together.
- All of the details of starting the business, including licenses, marketing, naming the business, finding product sources, etc. are the responsibility of the owner.

### **2.9 Small business in Gaza**

There is no Palestinian definition for small business so the opinions of researchers differ around the world because of different cultures, capabilities, economic and social conditions among the counties to determine accurate and comprehensive term of small business to specialize it from other types of business. (Tamleh,2009).

The majority of existing projects in Palestine are mini or micro projects they become a refuge citizens in the absence of the elements of big projects, as researches showed that more than 90% of institutions operating in the Palestinian territories it operates between (4-10) workers.

That means every organization or a firm that has type of projects such as industry, craft, trade or service. Its capital is more than 500 and less than 50000 Dinar and which involves 1-50 people and has its owner managing the business on a day-to-day basis(Katz and Green,2007).

Small and medium size enterprises contribute about 50% of global GDP, they also provide 40-80% of the total employment and the major role to play in development and contribute to reducing unemployment, so the interest in this type of projects in some countries reached to the extent of the formation Mini stories to support small and medium-sized enterprises, as happened for example in France and Malaysia.

According to Palestinian Central Bureau of Statistics (PCBS), Press Release on the Results of the Labor Force Survey, Second Quarter (April– June, 2014)Round, Main Results, the labor force participation rate of persons aged 15 years and above was 45.8%

The number of persons participating in the labor force in Palestine was about 1,249,100 in the 2nd quarter 2014; about 804,600 in the West Bank and about 444,500 in Gaza Strip.

The labor force participation rate in the West Bank was 46.4% and 44.7% in Gaza Strip, the gap in the participation rate between males and females in Palestine still very big it reached 71.7% for males compared with 19.4% for females.

Using International Labor Organization (ILO) standards, the number of unemployed was 328,800 in the 2nd quarter 2014 compared with 328,000 in the 1st quarter 2014; distributed as 200,400 in Gaza Strip and 128,400 in the West Bank during 2nd quarter 2014.

The unemployment rate in Gaza Strip increased from 40.8% in the 1st quarter 2014 to 45.1% in the 2nd quarter 2014 while it decreased in the West Bank from 18.2% to 16.0% during the same period. And the unemployment rate for males in Palestine was 22.8% compared with 39.6% for females in the 2nd quarter 2014.

The highest unemployment rate in the 2nd quarter 2014 was 43.1% among youth aged 20-24 years. For years of schooling, the highest unemployment rate among females with 13 years of schooling or more was 53.1%.

The highest unemployment rates in the West Bank governorates were in Bethlehem with 19.4%. In Gaza Strip, the highest unemployment rate was in Deir Al-Balah with 55.8%.

According to the relaxed definition of unemployment in Palestine, the unemployment rate decreased from 29.3% in the 1st quarter 2014 to 28.9% in the 2nd quarter 2014. (PCBS website).

### **2.9.1 Types of Small Business in Gaza**

There are many types of small business in Gaza which can be briefed as follows:

- Industrial projects.
- Commercial projects.
- Service.
- Small women projects.
- Agricultural projects.

- Small business in NGOs.
- High-Tech or ICT startups.

Additionally, the main components of small business in Gaza are:

- Capital : such as materials, equipments and finance
- HR: labors have skills and qualifications to do their works well.
- Profit: the main goal of the project is to gain profit or income. (Alshaqra and Barakat, 2013)

## 2.9.2 The Importance of the Small Business in Gaza

In recent years, unemployment in Palestine is increasing continually because of many political and economical reasons, hence, the importance of small business in Gaza is highlighted for the main following points:

1. **Cheap source to create new jobs:** This means that creating jobs in small and medium-sized enterprises is cheaper than large projects.
2. **Creation of local management skills:** The small projects are as fields for individual's experiences through which they learn how to overcome the problems of management, production and marketing, in particular the management institutes and training centers in Palestine is limited in number and weak. The establishment of small enterprises helps to provide successful management skills for entrepreneurs.
3. **Reduce the size of unemployment:** Small businesses help to rapid absorption of labor due to ease of set up and also the small capital employed.
4. **Optimal use of the national capital:** Small and medium-sized enterprises have the ability to attract and utilize the national savings, rather than remain in the form disabled savings.
5. **Reducing the concentration on projects in large cities:** The establishment of small businesses in small towns and rural regions helps to reduce overcrowding and the concentration of population and environmental pollution, also it leads to the use of cheap labor and the use of raw materials. For example, in the provinces of Gaza, we find that the agricultural production is available the northern and southern region, and this offers the possibility of establishing a small food

industries covering the needs of the domestic market. Also, areas of the West Bank produce stone and marble, which led to the spread of the quarries and the possibility of exporting these materials.

## **2.10 ICT Enterprises in Gaza**

ICT sector in Gaza is considered relatively developed because of the closeness of the state of occupation; Israel, which considered one of the most developed countries in high-tech, therefore, internet service provider and high-tech equipment companies face a fierce competition from its Israeli counterparts which make the internet service, laptops and other smart equipments affordable and within hands.

Giving the regular closure of Gaza only two crossings which prevents the movement of goods and individuals, the ICT startups witnessed a great progress in the recent years in an attempt to break the siege and make living despite the unjust siege imposed on Gaza.

The local universities in Gaza held its responsibilities and launch two big programs to support the youth initiative and encourage them to start their own high-tech business by incubating their newly born companies and provide them the necessary managerial, financial, consultation, logistics, marketing and training programs to enhance the entrepreneurs' capabilities and make their enterprises see the light.

Islamic University of Gaza, the biggest in the Gaza Strip, has launched two main programs called "Creatives" and "Entrepreneurs" 1 and 2.

### **2.10.1 "Entrepreneurs" Program:**

It is a project to support and develop the Entrepreneurs, innovative, entrepreneurial and ambitious ideas in the field of information technology and communications which can be turned into income-generating activities through financial, administrative and technical support which enhance their chances of success so that they may develop and become successful self - reliant enterprises which can be marketed locally and regionally.



The project is implemented by Deanship of Community Services and Continuing Education in the Islamic University of Gaza in partnership with the Business and Technology Incubator and the Palestinian Information and Communications Technology Association (PICTA) and in cooperation with the WELFARE Association and funded by the Arab Fund for Economic and Social Development.

The project targets the youth and graduates who have entrepreneurial ideas in Gaza Strip from both gender aged between 19 to 29 from different specializations, and the objectives of the project can be summarized as following:

- Support of 30 entrepreneurial projects and following up their development.
- Encourage the youth to carry out entrepreneurial works through disseminating the entrepreneurial culture, concepts and various mechanisms of leadership.
- Help youth in developing their entrepreneurial ideas and embodying them in sustainable income - generating activities.
- Open new horizons for jobs for graduates from different specializations.

### **2.10.2 Business and Technology Incubator (BTI) at the Islamic University of Gaza (IUG)**

BTI was established in 2006 as a project funded by the World Bank through Information for Development Program (InfoDev). After that BTI received another grant by Tertiary education Project through Quality Improvement Fund (QIF) at the Ministry of higher education. This grant was used in operating and developing the incubator and incubating new SMEs. (Website of the Business and Technology Incubator, 2012)

After that, BTI in Partnership with Community Service and Continuing Education Deanery at IUG and PICTA has successfully implemented —Entrepreneurs 1— Project funded by Welfare and Arab Fund for Socio-Economic Development. In 2011: BTI with the support of SPARK and The Netherlands Ministry of Foreign Affairs has kicked-off a program for supporting Palestinian Entrepreneurs and SMEs in the Gaza Strip lasting for 2015. In Addition, BTI in partnership with Community Service and Continuing Education Deanship and The Palestinian Information & Communications Technology Association has recently launched Entrepreneurs 2 project.

BTI in partnership with Bid Network works also on supporting incubated and graduated SMEs and entrepreneurs towards enhancing their investment opportunities through providing online and offline services.

Since its establishment, more than 30 companies have been graduated from the BTI, and the Business and Technology Incubator seek to achieve the following objectives:

- Provide a suitable environment for innovation and creativity.
- Participate in the enhancement of the graduates social situation by helping them establish their own businesses.
- Create and nurture relationships with bi/multilateral development organizations in order to cooperate on joint economic development initiatives that have an ICT component.
- Assist existing Palestinian ICT firm's to access regional and international markets.
- Help non-ICT industry sectors integrate ICT into their business operations.
- Create promotion and marketing strategies focused on regional and international markets.
- Create and nurture relationships with bi/multilateral development organizations in order to cooperate on joint economic development initiatives that have an ICT component.
- Establishing a dynamic and market driven industry-university linkage programs focusing on identifying the key technical and business curriculum that are essential for university graduates to be internationally competitive in their fields.
- In addition to establishing educational and training programs to produce technical talents to compete in a regional and international level.
- Work with regional/international investors and financial institutions to create a loan fund for new ICT enterprises in Palestine while also providing investment capital for ICT firms and non ICT companies. (Website of the Business and Technology Incubator, 2012)

## **Chapter 3**

### **Previous Studies**

#### **3.1 Introduction**

**First: Qualitative studies for Critical Success Factors or Barriers/Obstacles face SME's**

**Second: Quantitative and AHP Studies**

#### **3.2 Researcher Comments on the Previous Studies**

### **3.1 Introduction**

This chapter goes through the previous studies which are relevant to the study field and objectives; it is divided into two main categories; qualitative studies which investigate the critical success factors and/or the main challenges and obstacles which face the small business in general and ICT sector in specific and quantitative and AHP studies which deal with the SME's sectors and others, finally it contains the researcher comments on these previous studies.

#### **First: Qualitative studies for Critical Success Factors or Barriers/Obstacles face SME's**

##### **1.(Rana EL-shaqra & Huda Barakat, 2013)**

#### **“The obstacles which are facing Entrepreneurs to create small Business in Gaza”**

Starting and operating a small business includes a possibility of success as well as failure. Because of their small size, a simple management mistake is likely to lead to sure death of a small enterprise. This study sought to understand the challenges that are faced by entrepreneurs when they decided to establish their start-ups in Gaza strip and how they can manage the challenges they face. These challenges seem to change (evolve) according to different macro and micro conditions. This study employed a random sample to collect data from 130 businesses using interviews and questionnaires. The data was analyzed descriptively and presented through figures, tables and percentages. The findings indicate that small businesses face the following challenges; financing, marketing, HR, information technology, rules and regulation, and incubator support challengers. Understanding the factors hindering the growth and survival of small businesses in Gaza will help policy makers – governments, NGOs, and other stakeholders – to design targeted policies and programs that will actively stimulate innovation, as well as helping those policy makers to support, encourage, and promote small businesses for unemployment alleviation. The research is concluded by a range of solutions for each challenge.

**2. (Ahmad Z. S. & Xavier S. R., 2012)**

**“Entrepreneurial Environments and Growth: Evidence from Malaysia  
GEM Data”**

The purpose of this paper is to explore the entrepreneurial activities in Malaysia through determining some demographic characteristics, expert and individual perceptions of Malaysian entrepreneurs, in addition to the environment for entrepreneurship, and to highlight Malaysia's entrepreneurial position internationally.

The study was drawn from country level data provided by the National Malaysia GEM (Global Entrepreneurship Monitor) to evaluate the current status of entrepreneurial environments in the country.

The findings show that the early stages of entrepreneurship development in Malaysia are very dynamic and volatile. The number of early stage entrepreneurial activities in Malaysia is still lower than in other parts of developing countries. Inadequate financial support, bureaucracy and inconsistency of government policies, lack of entrepreneurial education at tertiary level and inadequacy of entrepreneurial training are some of the important obstacles encountered by entrepreneurs in Malaysia. On the other hand, there are favorable entrepreneurial environmental conditions determined in this study that are promising: the physical infrastructures and services access towards entrepreneurship, and the financial environment related with entrepreneurship.

The results are also useful for optimizing the local entrepreneurial environment, and are helpful for policy decision makers. Institutions need to be strengthened before entrepreneurial resources can be fully deployed.

This paper provides the Malaysian government with theoretical support so that the government can utilize limited resources to develop entrepreneurial activities.

**3. (Rima M. Bizri, Alia Kojok, Abdallah Dani, Mohammad Mokahal, Mohammad Bakri, 2012)**

**“Barriers to Entrepreneurial Endeavors in a Developing Economy”**

Entrepreneurship has long been perceived as one of the significant factors leading to development. This research examines the barriers that pose as obstacles to the pursuit of entrepreneurial endeavors in Lebanon, a middle-eastern developing nation.

This study is based on quantitative research, using a questionnaire of 27 items for data collection. Descriptive data and statistical analyses are presented to identify and assess barriers to entrepreneurship in Lebanon.

This study provides valuable insight into the factors affecting entrepreneurial inclination in developing countries. The findings of this study suggest that there are important barriers to entrepreneurship in developing countries. In Lebanon, the most significant of those barriers are: the lack of social network, lack of external stability, risk aversion, and lack of a business environment conducive to entrepreneurship.

The significance of this research lies in the fact that it fills an important gap in the literature, offering deeper understanding of the barriers to entrepreneurship in developing nations, while focusing on a representative middle-eastern developing country: Lebanon.

#### **4. (Monia Lougui, 2010)**

##### **“Identifying Obstacles Encountered by Swedish Entrepreneurs”**

##### **Evidences from the Start-line**

The existing link between entrepreneurship and economic growth suggests that entrepreneurship and small firms are factors that positively affect growth in an economy. This is where the interest for entrepreneurship takes its first steps and where the journey through different features influencing entrepreneurship begins. In this paper we dispose of a unique database containing information concerning the characteristics of Swedish entrepreneurs and the questions they ask when starting a business. We apply a multinomial logic model regression to analyze the areas where most of the Swedish entrepreneurs find impediments and difficulties for starting their own business. The results indicate that Swedish entrepreneurs experience administrative costs and financing as the greatest impediments in their process of starting and running a business. Moreover, the results show that self-employed operating in the manufacturing industry and located in Jämtland are the individuals facing most obstacles when starting a business.

This paper try to explain the positive relationship between entrepreneurship and economic growth in Sweden through answering these questions “What are the obstacles Swedish entrepreneurs encounter?”, “Who are the entrepreneurs confronted with obstacles when starting a new business in Sweden?” and “In which phase of the entrepreneurial activity are entrepreneurs most likely to encounter obstacles”

Finally the results of the study indicate that financing and administrative costs are the greatest impediments for Swedish entrepreneurs. Surprisingly, the results suggest that the probability of an increase of questions concerning laws and taxes as a result of the increase of individuals getting in touch with the start-line is not as high as the probability of administrative costs and financing questions. Which means laws and taxes do not represent such a great obstacles for self-employed as expected

The Swedish state should interfere by facilitating the access to financing and information concerning the conditions as well as a simplification of the application forms and the procedures engaged in starting a new business. Also, Entrepreneurs in the manufacturing industry in Sweden are also in need for support and the state if it desires to promote the industry needs to interfere by deleting the strong barriers experienced by the entrepreneurs. Finally, self-employed, the individuals in the manufacturing industry, and individuals in Jämtland are the most likely to face obstacles when starting a business. The state should identify the reason behind the entrepreneurial obstacles and remove them if it plans to lift up entrepreneurship in this region.

**5. (Hassan Gholipour Fereidouni, Tajul Ariffin Masron, Davoud Nikbin, Reza Ekhtiari Amiri, 2010)**

### **“Consequences of External Environment on Entrepreneurial Motivation in Iran”**

The purpose of this study is to examine importance of business environment, social status of entrepreneurs, and country external conflicts as predictors of motivation to start a business in an environment, such as that in Iran, in which the economy is highly dependent on government initiatives. Data are collected from 106 MBA students through questionnaires. Respondents are questioned regarding the perceived importance of the

business environment, socio-cultural factors (social status), and country external conflicts.

The results show that the importance of business environment and country external conflicts contribute considerably to the level of entrepreneurial motivation. Further, the results reveal that social status is not a critical factor in determining the level of motivation to start a business. In particular, business environment is the most important factor in predicting entrepreneurial motivation. The results contribute to the growing body of literature in entrepreneurship and provide some implications for Iranian policy makers to create favorable external environment for potential entrepreneurs.

#### **6. (Thair Adnan Kaddumi, 2010)**

##### **“Small Enterprises Finance in Jordan – Obstacles and Challenges”**

Small Enterprises are one of the most important key elements in achieving economic development in all countries of the world where it accounts for the highest percentage among all kinds of economic projects of all sizes. This study seeks to look at the importance of small enterprises, and to identify the most important constraints faced by small entrepreneurs in obtaining the required funding, and what are the most important impediments toward financing of small projects. This is conducted through a field study on a sample of entrepreneurs, 568 questionnaires were analyzed, and the study has reached to a number of results - Inadequate amount of funding by the microfinance institutions, as well as the rigid collaterals asked by financing institutions for loan approval, moreover the high interest rates was one of the most important obstacles faced the study sample entrepreneurs.

Based on the results of the study, the researcher recommended the need by microfinance institutions to provide the full amount of funding required to ensure the success of the project and the payment of loan installments, and the necessity of activating the role of government in guaranteeing by establishing a special body for the purpose, the study also recommended the need for commercial banks to establish special fund for micro-financing at low interest rate.



7. (Michael Bowen, Makarius Morara, Samuel Mureithi, 2009)

**“Management of Business Challenges Among Small and Micro Enterprises in Nairobi-Kenya”**

Small and Micro Enterprises (SMEs) play an important economic role in many countries. In Kenya, for example the SME sector contributed over 50 percent of new jobs created in 2005 but despite their significance, SMEs are faced with the threat of failure with past statistics indicating that three out of five fail within the first few months. This study sought to understand how SMEs manage the challenges they face. These challenges seem to change (evolve) according to different macro and micro conditions. This study employed stratified random sampling to collect data from 198 businesses using interviews and questionnaires. The data was analyzed descriptively and presented through figures, tables and percentages. The findings indicate that SMEs face the following challenges; competition among themselves and from large firms, lack of access to credit, cheap imports, insecurity and debt collection. Credit constraint seems to be easing up when compared to previous researches. Relevant training or education is positively related to business success. The SMEs have the following strategies to overcome the challenges; fair pricing, discounts and special offers, offering a variety of services and products, superior customer service and continuously improving quality of service delivery. The research concludes that business success is a consequence of embracing a mix of strategies.

8. (Khalid Abed Dahleez, 2009)

**“The Role of Business Incubators in Developing Entrepreneurship and Creating New Business Start-ups in Gaza Strip”**

This research aims at identifying the role of business incubators in developing entrepreneurship and creating new business ventures. It also aims at identifying and studying the business incubation initiatives, business fields suitable for business incubation, services provided of business incubators, and success factors and obstacles facing business incubators. Another objective of the research is studying the level of entrepreneurship, the entrepreneurial characteristics, and the effect of demographic data

& family profile on the entrepreneurial characteristics of university students in Gaza Strip.

The present investigation consists of literature review in subjects related to business incubator, provided services, success factors, faced obstacles, and adopted policies & criteria of incubation. The literature review is also investigating entrepreneurship components, motivators, entrepreneurial characteristics, entrepreneurial process, and economic perspectives of entrepreneurship and business incubators.

The researcher makes use of different tools to implement this study: workshops, interviews, focus groups with experts and professionals and by designing a questionnaire to test entrepreneurial characteristics and intentions of university students toward entrepreneurship and to test their perceptions about business incubators in addition to demographic factors and personal profile of entrepreneurs.

The population of the study is the students in their final year of bachelor education in selected faculties and specializations in engineering, commerce, and information technology at the Islamic University of Gaza (IUG). The questionnaire was piloted and tested for validity and reliability and data didn't follow the normal distribution. Nonparametric test were used in the study. Data was described and analyzed for the whole sample to take a general view and respondents were classified as entrepreneurially inclined and non-entrepreneurially inclined based on their desire to establish their own business after graduation from university.

The deep analysis of data based on the entrepreneurial inclination of respondent and their knowledge about business incubators reveals the following points:

Nearly quarter of the students was entrepreneurially inclined and most of them are from the engineering faculty and the business administration department. Self-satisfaction is the primary motivation behind establishing own business and money is the most required resource for establishing business.

There were no differences between entrepreneurially and non-entrepreneurially inclined students regarding entrepreneurial characteristics but for business skills. Two thirds of entrepreneurially inclined students were males, (26.2%) were the first child in birth order in their families.

There is no dependency between entrepreneurial inclination of students and their gender and faculty but dependency exist with academic specialization. The entrepreneurial inclination of students is dependent with their father's occupation and independent with the education of their parents.

Academic courses and workshops were the most effective tools for disseminating knowledge about business incubators and no dependency exists between entrepreneurial inclination of students and their knowledge about business incubators.

Direct finance is the most important service to be offered by business incubators and the training in creativity and critical thinking is the most important in training services. (44.2%) prefer to have a full partnership with the incubator for profit sharing and (58.6%) prefer to leave the incubator directly after achieving profits. Information technology is the most preferred field for incubation and (45.5%) of respondents prefer to build the incubator in technology town. Occupation, closure and siege were the most top ranked obstacles to the development and operation of business incubators.

The study recommended to build a national strategy and to achieve the cooperation from academic institutions in terms of establishing new academic plans, and the cooperation from local industry and private sector in order to support establishment and development business incubators.

#### **9. (K. Lavanya Latha & B.E.V.V.N. Murthy, 2009)**

##### **“Problems of Small-Scale Entrepreneurs in Nellore District”**

The purpose of this paper is to study the problems faced by small-scale entrepreneurs in Nellore District of Andhra Pradesh, India and also to study the opinions of entrepreneurs regarding what are the different factors which are helpful for success of entrepreneurship.

The paper is conducted by choosing a sample size of 30 per cent (196 units) randomly from the total population of 653 units. The data are collected through a structured questionnaire, informal interview and analyzed by using mean, ANOVA and Z-test.

It is found that high price of raw materials, lack of marketing information and marketing of products are major problems faced by the entrepreneurs, followed by competition from

small industries and absenteeism of labor. The majority (about 90.3 per cent) of the respondents did not want to make any complaint to government agencies.

The findings help to know the problems faced by small-scale entrepreneurs in a developing country such as India and also help the policy makers to solve these problems

**10. (Ali Salman Saleh, Nelson Oly Ndubisi, 2006)**

**“An Evaluation of SME Development in Malaysia”**

Small and medium enterprises (SMEs) in play a vital role in the Malaysian economy and are considered to be the backbone of industrial development in the country. However, few studies examined their development, challenges and future prospects. Therefore, the aim of this paper is to examine and analyze the role of SMEs in different sectors as well as their major contribution to the economy. The paper goes further to review the existing literature as well as the empirical studies in order to identify the major challenges (domestically and globally) that face this sector. The key messages from the studies examined in this paper are that Malaysian SMEs still face many domestic and global challenges in achieving economies of scale and competing internationally. Among the challenges are the low-level of technological capabilities and limited skilled human capital resources, a low level of technology and ICT penetration, low levels of research and development (R&D), a substantial orientation towards domestic markets, a high level of international competition (for example, from China and India), a high level of bureaucracy in government agencies, and internal sourcing of funds. These characteristics suggest that government programs and incentives are either insufficient or not delivered effectively enough to overcome these problems. This paper attempts to identify the challenges as a positive first step towards formulating a workable framework for the SMEs to overcome them.

**11. (Mahesha Kapurubandara, and Robyn Lawson, 2006)**

**“Barriers to Adopting ICT and e-commerce with SMEs in Developing Countries: An Exploratory Study in Sri Lanka”**

This research indicates that e-commerce offers a promising way for organizations to meet challenges of an ever-changing environment. However, the few available studies related to SMEs in developing countries reveal that they lag behind and are skeptical about adopting the technologies irrespective of their effectiveness. Literature reveals many significant reasons contributing towards this reluctance. The various factors identified as causes for the reticence can be broadly classified as Internal Barriers and External Barriers. Internal Barriers can be resolved within the organization by the organization itself, while External Barriers need to be addressed either by government intervention or by collaboration of SMEs. This paper presents a model for barriers to adoption of ICT and e-commerce, collected from the available literature and the results of an exploratory pilot studies and subsequent survey. In addition to the barriers facing SMEs, this research identifies the relevant support required by SMEs in a developing country, Sri Lanka. The methodology and initial issues found in the study are also discussed.

**12. (Al- Mahrouk Maher,2006)**

**“Small and Medium Enterprises, the Importance and the Impediments in Jordan”**

In this paper the researcher collected random sample about 510 projects and it marks-up 2.5% from the whole small businesses in Gaza strip.

Starting such projects and keep them in good manner is considered the most important element for economic and social developments in all countries around the world and especially in developed countries. This research discuss the nature of those business, the barriers which prevent those companies to start and to be themselves especially the financial barriers, and the methods and procedures applied to overcome those barriers.

The main results of this paper are Jordanians believe that institutions which characterized by high growth rates usually resort for short term financing even though it show negative relationship between size of the company and long-term loans because generally the big companies are the greatest beneficiaries from those loans. Also, at the beginning of the company, it based on private finance regardless of the size of the company.

**13. (Samya ben Ramadan ,2006)**

**“SMEs Challenges in Developing Countries from the Economic and Social Perspective- Algeria as A Case Study”**

The objective of the paper is to highlight the barriers faced by small and medium enterprises in developing countries and mechanisms from economic and social perspective in Algeria. Because these projects are considered one of the most important economic development processes which lead to develop national economy of any society and then identify the mechanisms to handle these constraints.

The findings of this study indicate the economic, social and cultural barriers for development of industrial SMEs. Also, social factors aren't less importance than the techno-economic factors in industrial development process.

Regardless of the above mentioned obstacles, overcoming them through series of industrial processes related to social, economic and technical factors shouldn't be temporary solutions but they should find final strategies to get rid of them forever.

**14. (Shirin Adnan Slatunh, 2005)**

**“Financial and administrative problems faced by small businesses in the Southern Region in Gaza strip”**

This study aims to identify the financial and administrative problems relating to start small projects also aim to find out how the attention of government agencies to support and encourage these projects through the study of the following things:

1. The nature and the type of small projects in the Southern Region according to size of the capital, the number of employees.
2. Working conditions in the projects in Southern Region where the availability of administrative and technical skills
3. How these projects seek to obtain on the financial sources for their projects.
4. The extent of government institutions to support small projects in the extent of government institutions to support small projects in Southern Region.

Through data analysis and hypothesis testing researcher found a set of results, included a precise definition for small projects, and determine the nature of the problems

faced by these projects are in the first stage of start the work such as lack of liquidity and poor infrastructure, etc., and also showed differences in the problems depending on the type of project, whether its internal such as financing and management or external related to environment.

**15. (Aristidis Bitzenis, Ersanja Nito, 2005)**

**“Obstacles to entrepreneurship in a transition business environment”**

**The Case of Albania**

The purpose of the study is to critically evaluate the obstacles and problems encountered by entrepreneurs while doing business in Albania, which is an economy in a transition because Albania is attempting to recover from economic decline and find means to develop and promote its businesses, to establish new enterprises, especially small and medium enterprises (SMEs), and to improve its managerial and entrepreneurial skills..

The research methodology incorporates a survey that uses interview and questionnaire techniques. The sample was determined on a stratified basis (probability-random sampling) involving the random selection of respondents from various strata of the population.

The most important obstacles faced by entrepreneurs in Albania include unfair competition, changes in taxation procedures, lack of financial resources and problems related to public order. Bureaucracy and corruption do not appear to represent significant barriers to entrepreneurship.

Research limitations/implications – Responses from the selected strata were not distributed proportionally among the targeted sample.

Legislative amendments and new legislation which focus specifically upon small business and enterprise development should be implemented by the Albanian government in order to achieve a transparent fiscal reform and create a more favorable business environment.

This research provides a critical evaluation of entrepreneurial activities and the obstacles that entrepreneurs encounter while operating in the Albanian economy in transition.

## 16. (LowK. Ch. P.,2005)

### “Cultural obstacles in growing entrepreneurship: case study in Singapore”

This paper seeks to identify the cultural obstacles or what discourages the setting-up of businesses among Singaporeans. This study attempts to answer the questions: What are some of the cultural obstacles to setting up enterprises in Singapore? Is there a lack of the spirit of self-dependence among Singaporeans? If so, what contributes to this lack of spirit of self-dependence? Then how can this spirit of self dependence be triggered, enhanced or nurtured? Finally, the research will suggests some solutions and strategies to promote entrepreneurship in Singapore.

Four obstacles are identified as the following: being over-compliant, too left-brained, over-pampered, and afraid of failure. They are assessed as stemming from two key trends: chiefly, a safe, orderly and affluent society and Singapore Government’s father- leadership style.

The paper implies the need for several cultural changes. Singaporeans can be more entrepreneurial by encouraging greater entrepreneurship in the Lion City the light of promoting the spirit of self-dependence, a wider, more global or out-of-the-box approach is needed to obliterate or minimize the four cultural blocks discussed. These further recommendations include:

- Taking a paradigm shift: Singaporeans to “work for others (but) save money and gain from the experiences of others” (Doris Phua, a lady entrepreneur, cited in Ang and Chang, 2004, p. 34); then start or run businesses.
- Adopting the “backpack mentality”: Singaporeans need to adopt what the researcher would coin as a “backpack mentality”, ready to move anywhere and be flexible, they seek to internationalize is to be entrepreneurial, changing the Singaporean mindset as well as expanding the citizens’ horizons.
- Embracing globalised thinking and networking: Low’s (2002) study has indicated that globalization is one of the 12 Singaporeans values and this could become Singapore’s strengths, it can help in enhancing Singapore’s entrepreneurial efforts.



- Tapping the melting-pot edge. Low et al. (1995) cited the Chinese, Malay and Indian Diasporas. Singaporeans can through their respective trade chambers tapping the rich ethnic connections for mutual benefits.

**17. (Sandra L. Fielden, Marilyn J. Davidson and Peter J. Makin, 2000)**

**“Barriers Encountered During Micro and Small business Start-up in North-West England”**

This research identifies the needs of new business owners, the barriers they encounter, and the strategies they use to overcome those obstacles. The findings indicate that financial difficulties and the attitudes of banks towards new business owners are the main barriers to successful enterprise creation, With mentors and more specific advice cited as the assistance regarded as affording the greatest benefit to potential and new business owners. In addition, small and micro business owners are going out of business, or are unable to fulfill their potential, because they are denied access to those factors that promote success.

The aim of this study was to identify the needs, problems and barriers encountered by individuals in the initialization and start-up of micro and small enterprises and the strategies they use to overcome those obstacles. The main objectives of the study were as follows:

- To identify the needs of entrepreneurs at different stages of the business start-up process.
- To identify the barriers encountered by entrepreneurs at the different stages of business start-up.
- To identify what practical structures and/or facilities are required by those involved in the initialization and start-up of new micro and small business start-up.

The findings of this study which based on 472 small businesses show the following:

- The barriers which are erected by government agencies, financial institutions and large business organizations affect the economic stability of new businesses.

These include a lack of investment in new businesses, a lack of adequate ongoing support, a lack of recognition of the problems faced by new businesses.

- In addition to that, Information technology skills are viewed as a critical factor in determining new business success in a global market.
- Financial difficulties and the attitudes of banks towards new business owners are the main barriers to successful enterprise creation which mark-up 67 percent that is considered the greatest percentage compared to other barriers.

## **Second: Quantitative and AHP Studies**

### **1. (Yueh-Hua Lee, 2014)**

#### **“A Decision Framework for Cloud Service Selection for SMEs: AHP Analysis”**

The purpose of this paper is to study how advances in cloud computing impact the processes of creating and running businesses over the tourism sector for small and medium-sized enterprises in Taiwan, and to identify the main factors that relate to the adoption of CRM cloud systems by SMEs. This study adopts two steps to build the structure of decision model with the method. The findings confirm that factors affecting the adoption of Cloud CRM service in SMEs are grouped into four categories, which is financial benefits, marketing benefits, management factors, and environment factors. This study hopes to enhance the quality of the evaluation process, and help support SME decision makers in exploring their opportunities surrounding Cloud services adoption.

### **2. (Seyed Kaveh Jamali, Behrang Samadi and DR. G. Marthandan, 2014)**

#### **“Prioritizing Electronic Commerce Technologies in Iranian Family SME’s**

This study investigates the most relevant e-commerce technology for Iranian family SMEs. The purpose of the study is narrowing down the range of e-commerce technologies to the most relevant one in such unique SMEs in Iran to fit their distinct needs and objectives. To this end, the relevant EC technologies in SMEs involving E-mail; Internet/Website, Intranet, Extranet, Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT) and Barcode (Alzougool and Kurnia, 2008) were prioritized by family SMEs’ experts through of (AHP) Method based on the specific needs and objectives in family SMEs in Iran. As a result, Internet/Website with 0.361 value point recognized as most fitted EC technology in Iranian family SMEs.

**3. (Aries Susanty, Diana Puspitasari, Sri Hartini, Ganung Sugi, 2014)**

**“Prioritization of Supplier Selection Criteria in Batik Industry: A Fuzzy-AHP Approach”**

Supplier selection is one of the most important problems in the supply chain of batik industry and its have strong effect on performance of SMEs. Proper selection of suppliers is very important for the profitability of SMEs and the direct and indirect consequences of poor decision making will impact the ability of SMEs to gain competitive advantage. This study reveals the application of Fuzzy AHP in some of SMEs in the batik industry to determine the relative importance of the criteria in supplier selection and to assign the weight to those criteria. These in turn help to identify the preferences of owner of SMEs at Laweyan Center (Solo), Kauman Center (Pekalongan), and Wijirejo Center (Yogyakarta) selecting their suppliers in the context of purchasing fabric and wax. The result of this study shows us that percentage of defect rate and offering price are the top rank and second rank in supplier selection in batik industry. SMEs in Laweyan Center have different patterns in assessing the degree of importance (rank) of the various criteria for supplier selection compared to the other region.

**4. (Ahmad Ghandour, 2014)**

**“A Fuzzy AHP Approach for Assessing Value Proposition in eCommerce Websites in SMEs in Abu Dhabi”**

Small and Medium Enterprises (SMEs) continue to struggle to measure the success of their website. This results in ineffective eCommerce activities and the consequent disappointment in recognizable benefits. Whilst a web marketing mix is a reference that can be used to measure the performance of a website, it does not consolidate the website offerings and it introduces fuzziness and vagueness when assessing the website. In this paper, because assessing a website can be seen as a multi-criteria decision making (MCDM), a fuzzy (FAHP) approach is used to evaluating eCommerce websites, which can tolerate vagueness and uncertainty of judgment. A case study is presented to demonstrate this approach.

**5. (Madani Alomar, 2013)**

**“Improving Performance of SME’s Using SCOR and AHP  
Methodology”**

This Paper proposes a framework that will help companies, particularly the small and medium-sized enterprises, assess their performance by prioritizing performance measures and supply chain processes.

The framework utilizes the SCOR model processes and performance attributes which help in standardizing process mapping and attributes. The authors also suggest the use of an Analytical Hierarchy Process approach to construct, link, and assess supply chain processes and performance attributes. The outlined framework is illustrated on a case of a family owned, medium-sized manufacturing company.

**6. (Teruyui Bunno, Hiroki Idota, Masaru Ogawa, Masatsugu Tsuji, Hiroaki Miyoshi and Machiko Nakanishi, 2013)**

**“Index of the Diffusion of Information Technology among SME’s: an  
AHP Approach”**

In this paper, we make an attempt to extract factors to promote ICT (Information, Communications Technology) use by SMEs (Small- and medium-sized enterprises). For this purpose, we first construct an index of ICT use. We conducted extensive mail surveys and in-depth interviews in two of the largest SME clusters in Japan, Higashi-Osaka and Ohta Ward, Tokyo in 2004. We sent questionnaires to more than 6,000 SMEs in two clusters, and received nearly 2,000 replies. Questions are related to (a) company characteristics such as industrial category, amount of capital, and number of employees; (b) the degree of ICT use by SMEs; (c) managerial behavior, in which SMEs are classified as the self-renovating, incentive, adaptive, or data-using type; (d) business environment such as the degree of competition; and (e) expectations and purposes for ICT use, such as raising profit and productivity. Among them, most important is (b) the degree of ICT, which includes items such as (i) the number of PCs owned by SMEs; (ii) the number of PCs connected by networks such as LAN; (iii) the amount of software that contributes to efficient utilization of managerial resources; and (iv) Internet use such as

homepages, e-mail, and e-commerce. These items are either quantitative or qualitative measures of IT use by SMEs. This paper proposes a method of constructing a single index of ICT use based on these four items by making use of AHP (Analytical Hierarchical Process). In so doing, we asked 11 ICT experts about their weights of four items listed above by comparing them. Moreover, based on these data, we extract exactly the factors promoting ICT use by SMEs by making use of the regression analysis. Among them, the most important element in promoting ICT use is found to be a future-oriented vision for SMEs, especially by aiming “speedup of business development,” After this vision is established, the exact methods of IT introduction and utilization of ICT should be determined to fit with specific goals. With this index, this paper also identified problems of ICT introduction by SMEs and policies desired by them.

**7. (Mostafa Hosseinzadeh, Seyed Mahdi Vesal, Reza Shamsaddini, Azadeh Kamel, 2013)**

**“Prioritizing Competitive Strategies in Iranian SME's Based on AHP Approach in Severe Economic Sanctions”**

The topic of this research is “review and prioritizing of competitive strategies in SME's in AHP method”. The main question to the presence research, is that according to the source and budget limitations that no organization can deploy those competitive strategies, so how best SME's, can use competitive strategy according to the present time that would fit best in the hard conditions of the market? Doing this work, we have used Michael Porter’s view about competitive strategy. This has made of Cost Leadership, Focus, and Differentiation. Statistic research, employers of SME's and survey-applied research method were used in this research. Data collection entails 63 Iranian SME's were as the sample for this study. After performing the research, the results reveal that the best strategy among competitive strategies for Iranian SME's is the Cost Leadership Strategy.

**8. (A. E. Dooley, D. C. Smeaton, G.W. Sheath and s. F. Ledgard, 2013)**

**“Application of Multiple Criteria Decision Analysis in the New Zealand  
Agricultural Industry”**

Agricultural decisions typically involve multiple criteria, some of which are subjective. Business, environmental, and lifestyle criteria are all important criteria in these decisions. These criteria can be difficult to trade-off using traditional methods. Multiple criteria decision analysis (MCDA) provides a formal, quantitative means of evaluating agricultural decisions taking all these factors into account. MCDA for agricultural decisions was evaluated using three applied case studies (use of new processing technology, selection of beef policies, and selection of farm systems in an environmentally sensitive catchment). The case studies all differed in their problem types and decision-maker requirements. A multi-attribute value theory approach was used for all the cases. This approach was selected using a descriptive framework which took the method limitations, problem attributes, and decision-maker requirements into account. The differences between the case studies, the application and the implementation of MCDA, the overall success of the process, and the potential use of MCDA in agriculture going forward are discussed. While MCDA was used to help identify the best decision, the main benefits that the decision makers identified included: learning about the decision, a better understanding of their own and others' perspectives, a structured way to work through the decision, a means to explain the decision, and stimulation of discussion and sharing of ideas. These benefits were particularly important for the group decisions. Participants were not overly concerned with the ranking accuracy. Problems in implementation included an initial lack of commitment to the process, understanding of the process and decision, and ownership of the decision. The limited time decision makers had available contributed to this. The majority of the decision makers liked the MCDA process for these strategic decisions. The quantitative approach and the graphic presentation appealed to them. Hence, simple MCDA approaches may be as effective as more complex ones, and can deliver many of the benefits particularly where the time is limited. There has been interest in the use of MCDA going forward.

**9. (Ravikumar M.M, Marimuthu.K , Parthiban.P, Abdul Zubar.H, 2013)**

**“Leanness Evaluation in 6 Manufacturing MSME’s using AHP & SEM Techniques”**

Lean is developed into a management method, which improves the overall standard of an organization. This study aims at providing a detailed outline of lean implementation helping managers to implement lean in their premises. The factors which affect lean implementing has been carved out of various literature works taking guidelines from experts from both industries and academies. For developing independent and latent variables Structural Equation Modeling (SEM) is used. For organizing and taking complex decisions used for ranking alternatives Analytical Hierarchy Process technique is used.

**10. (Arash Sadeghia, Adel Azarb and Ramin Sepehri Radc, 2012)**

**“Developing a fuzzy group AHP model for prioritizing the factors affecting success of High-Tech SME's in Iran: A case study”**

Small and medium enterprises (SME's) play a vital role in economic development of countries. It has been estimated that about 80 percent of world economic growth is created by SME's. This research aims to develop a model to evaluate factors affecting Iranian high-tech SME's success. For this purpose a hierarchal model with 10 main factor and 47 sub factors has been suggested. Since the evaluated factors were qualitative, a fuzzy modification of the group (AHP) method was applied and Chang’s extended analysis has been applied to analyze the fuzzy data. Finally, considering the relative importance of criteria, Critical Success Factors (CSF's) of high-Tech SME's were identified. These CSF's were employed in a fuzzy TOPSIS model in order to performance evaluation and rank the 17 high-tech firms located in Bio-Technology Incubator of Karaj. Results show that entrepreneur related factors, market characteristics and Product features are the most important success factors of Iranian high-tech SME's respectively.



**11. (Bruno Gonçalo Nunes and João Paulo Costa, 2012)**

**“Supporting the Diagnostic of Portuguese SME using AHP”**

This study suggests the use of the (AHP) to evaluate intervention measures in Portuguese Small Medium Enterprises (SMEs). These measures result from an external diagnostic performed under the QREN program (“Quadro de Referência Referência Estratégico Estratégico” – Strategic Reference Frame). QREN aims at the development of Portuguese economy and is financed by the European Union.

The results showed that the AHP application enables to rank the intervention measures and to focus on the most promising ones. It presents the results of applying the AHP over two cases and it showed that AHP adds consistency and focus to the interventions in the framework of QREN.

**12. (Chengter Ho and Yi-Fan Yang, 2012)**

**“The Key Success Factors of Small Business Innovation and Research of Taiwan Automotive Electronics Industry”**

In recent years, Taiwan government provides incentive program, 50 million US Dollars annually, to encourage the risky and costly innovation and new technology development activities in small business. The key success factors of this SBIR program are the main issues in this research. They are investigated by Delphi method and (AHP). The important factors related to the successfulness of SBIR program were investigated by literature research in order to compile an expert questionnaire in Delphi method and AHP. The questionnaire is composed of four dimensions and sixteen factors of research and innovation. The questionnaire was distributed to R&D managers of the SBIR grant recipient companies. Through AHP survey, it is confirmed that the government supports and cooperation with academia is the most important key factor.

**13. (Patchara Boonyaprasit, Sen Yang, 2010)**

**“How SMEs make their decision for choosing an optimal ERP provider by using AHP method”**

Nowadays, most small- and medium-sized enterprises (SMEs) are seeking information technique(s) or packaged software for improving their market competitiveness. Enterprise Resource Planning (ERP) system could be a good choice regarding it is a powerful system which is integrated software for operating different perspective of a business, all information within organization would be flow between each organization's modules. There are numerous of ERP providers on the market, previously they were focusing on large organization but now, the attention are moving toward SMEs business by offering cheaper and flexible solutions. To be success in implementation, an appropriated ERP system is required. Nevertheless, an (AHP) method should be able to provide the optimal solution for SMEs suggested by the authors. This study employed a quantitative survey and followed by qualitative interviews which aim to confirm the data and information from the survey. The questionnaires were sent to SMEs' IS managers and relevant employees in China regards to which criteria they focus on when selecting an ERP provider. The thesis concludes that our respondent give more consideration to the facts of Implementation and Flexibility among other criteria when choosing an ERP provider. Moreover, a systematic method for selecting an ERP system for SMEs is proposed and presented in this research.

#### **14. (Schaul Chorev and Alistair R. Anderson, 2006)**

##### **“Success in Israeli High-Tech Start-Ups; Critical Factors and Process”**

This paper develops a model of the factors deemed critical for success in high-tech new ventures in Israel. Israel presents an interesting forum, geographically distant from main markets but richly endowed with human capital, new high-tech ventures are seen as an essential element of the economy. Yet, despite its importance, high-tech is characterized by risk and challenge. Consequently a model which draws on the experience of success and failures should be valuable. Our multi stage methodology enrolled the wisdom and experience of founders, managers and financiers of high-tech businesses to identify and categories the importance of the factors and the role played by these factors. We found that success factors could be grouped as critical or as important. The first group categorized the idea, strategy, the core team's commitment, expertise and marketing as critical. Important factors were deemed to be management, customer

relationships and research and development. The least important factors proved to be those external to the firm, the economy, politics and the general business environment. Overall the study emphasized that the attitudes and abilities of the core team were paramount. Although the model is based on the Israeli experience, many of the aspects are global. Consequently the study may have broad applicability.

**15. (Hua-Yang Lin, Ping-Yu Hsu and Yung-Tai Yeh , 2006)**

**“Application of the AHP in data warehouse system selection decisions for SMEs in Taiwan”**

This study investigates the practice of data warehouse system selection decisions for Small and Medium-sized Enterprises (SMEs) in Taiwan.

As data warehouse system evaluation and selection are often costly and time consuming, the need for a decision-aid approach to software selection is obvious, especially for SMEs. The aim of this study is to determine significant factors that influence data warehouse system selection of SMEs. Both technical and managerial factors are considered in structuring an evaluation hierarchy based on the (AHP). The results indicate that SMEs select data warehouse systems that focus mainly on cost and vendor criteria.

**3.4 Researcher Comment on the Previous Studies**

It can be said that there are many qualitative and descriptive studies which investigate the success or failure factors of the small and medium enterprises with different fields as noticed in the previous studies in addition to small portions of quantitative studies, this research is classified as a quantitative research which will prioritize the critical success factors for the SME's working in ICT sector in Gaza.

This research tackles the main problems, obstacles, impediments and challenges of small and medium enterprises, as other researches, problems or barriers facing such as finance, marketing, legal and governmental constraints and the knowledge and the experience of the owner of the business before the start or at the early stages of the small business. But in the same time there is one main difference between this research and the others which is that this research will model these critical success factors in a

hierarchical system by the help of a well-know quantitative tool called Analytical Hierarchy Process (AHP) so that it can be prioritized by experts and managers working in the field.

Table 3.1 shows some researchers conducted in Gaza strip investigated the ICT sector enterprises and their main objectives and findings, the main difference between these researches and this research, that it uses the science of quantitative methods to jointly compare and prioritize the critical success factors for the ICT enterprises in Gaza.

Taking the above into consideration and to the best of our knowledge, no such researches about identifying or prioritizing the Critical Success Factors (CSF) has been carried out in Palestine or at least in the Gaza Strip to date.

**Table (3.1): Previous studies conducted in the same field in Gaza**

Title	Researcher/s	Brief Review
“The obstacles which are facing Entrepreneurs to create small Business in Gaza”	(Rana EL-shaqra & Huda Barakat, 2013)	This research investigates the challenges which face the SME’s in Gaza. it employed a random sample to collect data from 130 businesses using interviews and questionnaires.
“The Role of Business Incubators in Developing Entrepreneurship and Creating New Business Start-ups in Gaza Strip”	(Khalid Abed Dahleez, 2009)	This research aims at identifying the role of business incubators in developing entrepreneurship and creating new business ventures. It also aims at identifying and studying the business incubation initiatives, business fields suitable for business incubation, services provided of business incubators, and success factors and obstacles facing business incubators.  The present investigation consists of literature review in subjects related to business incubator, provided services, success factors,

		<p>faced obstacles, and adopted policies &amp; criteria of incubation. The researcher makes use of different tools to implement this study: workshops, interviews, focus groups with experts and professionals and by designing a questionnaire to test entrepreneurial characteristics.</p>
<p>The Role of Business Incubators in Achieving the Sustainable Development in the Gaza Strip Case Study: The Business and Technology Incubator at IUG</p>	<p>Mohammed Z. Skaik</p>	<p>This study investigates the role of business incubators in achieving the sustainable development in the Gaza Strip as an important part of Palestine through studying a case study of the Business and Technology Incubator at IUG. It aims at exploring the barriers facing the startups and entrepreneurs in the Gaza Strip; identifying the business incubators and its services offered to start ups; studying the reasons of success and failure of incubated and graduated companies in business incubators, clarifying the role of business incubators in linking academic institutions with the industrial sectors, and then investigating the role of business incubators in the overall economic development in Palestine.</p> <p>The study has adopted the descriptive analysis approach using the performance indicators concluded from a wide research among the literature.</p>

## **Chapter 4**

### **Multi-Criteria Decision Making (MCDM) and Analytical Hierarchy Process (AHP)**

#### **4.1 Introduction**

#### **4.2 Multi-Criteria Decision Making (MCDM)**

##### **4.2.1 MCDM Steps**

##### **4.2.2 Classification of MCDM techniques**

#### **4.3 (AHP)**

##### **4.3.1 Thomas L. Saaty**

##### **4.3.2 AHP Definition**

##### **4.3.3 Uses and applications of AHP**

##### **4.3.4 AHP Principles and Axioms**

##### **4.3.5 AHP Methodology**

##### **4.3.6 Hierarchical Structuring of the Problem**

##### **4.3.7 Performing Pair-wise Comparisons**

##### **4.3.8 Synthesis**

##### **4.3.9 Consistency Evaluation**

##### **4.3.10 AHP Applications**

##### **4.3.11 AHP Strengths and Weaknesses**

##### **4.3.11.1 Weaknesses of AHP**

##### **4.3.10.2 AHP Strengths**

## **4.1 Introduction**

This Chapter introduces the theoretical background of the research; it briefly mentions the Multi-Criteria Decision Making (MCDM) and its steps, then it illustrates in some details the AHP tool, its foundation, definition, uses and applications, axioms, methodology, hierarchal structure of the problems, performing pair-wise comparisons, synthesis, consistency evaluation, applications and finally strengths and weaknesses.

## **4.2 Multi-Criteria Decision Making (MCDM)**

A decision is a choice out of a number of alternatives, and the choice is made in such a way that the preferred alternative is the "best" among the possible options. There are several yardsticks to judge the alternatives and there is no alternative which outranks all the others under each of the performance criteria. Thus, the decision maker does not only have the task to judge the performance of the alternatives in question under each criterion, he/she also has to weigh the relative importance of the criteria in order to arrive at a global judgment. In the beginning of decision making science the operations research presented a single criteria optimization model, which is based on the maximization or minimization of a single objective function, subject to some constraints. Making a decision based solely on a single criterion appears insufficient as soon as the decision-making process deals with complex organizational environments: It is difficult to summarize in a single objective the complexity of opinions. Thus it is assumed that decisions most often involve several conflicting objectives. This implies that real world problems have to be solved optimally according to criteria which prohibit an "ideal" solution – optimal for each decision maker under each of the criteria considered. Consequently, one must acknowledge the presence of several criteria which are at least partially contradictory and often non commensurable, leading to the development of MCDM.

MCDM is an advanced field of operations research that is devoted to the development and implementation of decision support tools and methodologies to confront complex decision problems involving multiple criteria, goals, or objectives of conflicting nature.

Numerous multi-criteria decisions are daily made, both in public and in private life: strategic decisions (in a company the choice of products and markets, for instance, and in private life the choice of a partner and a career), tactical decisions (the choice of a location for production and sales, the choice of a university or a job), and operational decisions daily or weekly scheduling of activities.

Methods for MCDM have been designed in order to designate a preferred alternative, to classify the alternatives in a small number of categories, and/or to rank the alternatives in a subjective order of preference; they may sometimes also be used to allocate scarce resources to the alternatives on the basis of the results of the analysis (Lootsma F. A., 1999).

#### **4.2.1 MCDM Steps:**

The main steps of MCDM are the following:

1. Establishing system evaluation criteria that relate system capabilities to goals
2. Developing alternative systems for attaining the goals (generating alternatives)
3. Evaluating alternatives in terms of criteria (the values of the criterion functions)
4. Applying a normative multi-criteria analysis method
5. Accepting one alternative as “optimal” (preferred)
6. If the final solution is not accepted, gather new information and go into the next iteration of multi-criteria optimization. (Dourmpos M., Grigoroudis E., 2013),

#### **4.2.2 Classification of MCDM techniques**

Several methods have been proposed to deal with MCDM problems, These are:

- **Value function methods:** These methods synthesize assessments of the performance of alternatives against individual criteria, together with inter-criteria information reflecting the relative importance of the different criteria, to give an overall evaluation of each alternative indicative of the decision maker’s preference.



- **Goal and reference point methods:** The decision maker specifies some goals to be achieved; if they are achieved the decision maker is assumed to be satisfied; if not the method seeks to get as close as possible to the goals.
- **Outranking methods:** The outranking methods approach by Roy (1968), are based on a pair wise comparison of alternatives. It provide an ordinal ranking and sometimes only a partial ordering of the alternatives which means that it can only express which alternative is preferred but cannot indicate how much.

These methods attempt pair-wise or global comparison among alternatives. An alternative (a) is said to outrank another alternative (b) if, taking into account all the available information regarding the problem and the decision maker's preferences, there is a strong enough argument to support a conclusion that a is at least as good as b and no strong argument to the contrary. (Lootsma F. A., 1999).

### 4.3 Analytical Hierarchy Process (AHP)

AHP is one of MCDM methods; it is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was originally developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then.

It has particular application in group decision making, and is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, and education.

Rather than prescribing a "correct" decision, the AHP helps decision makers find one that best suits their goal and their understanding of the problem. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions.

Users of the AHP first decompose their decision problem into a hierarchy of more easily comprehended sub-problems, each of which can be analyzed independently. The elements of the hierarchy can relate to any aspect of the decision problem—tangible or

intangible, carefully measured or roughly estimated, well or poorly understood—anything at all that applies to the decision at hand.

Once the hierarchy is built, the decision makers systematically evaluate its various elements by comparing them to one another two at a time, with respect to their impact on an element above them in the hierarchy. In making the comparisons, the decision makers can use concrete data about the elements, but they typically use their judgments about the elements' relative meaning and importance. It is the essence of the AHP that human judgments, and not just the underlying information, can be used in performing the evaluations.

The AHP converts these evaluations to numerical values that can be processed and compared over the entire range of the problem. A numerical weight or priority is derived for each element of the hierarchy, allowing diverse and often incommensurable elements to be compared to one another in a rational and consistent way. This capability distinguishes the AHP from other decision making techniques.

In the final step of the process, numerical priorities are calculated for each of the decision alternatives. These numbers represent the alternatives' relative ability to achieve the decision goal, so they allow a straightforward consideration of the various courses of action.

AHP is based on the experience gained by its developer, Thomas L. Saaty, while directing research projects in the late 1960's in the US Arms Control and Disarmament Agency. It was developed as a reaction to the finding that there is a miserable lack of common, easily understood and easy-to-implement methodology to enable the making of complex decisions. Since then, the simplicity and power of the AHP has led to its widespread use across multiple domains in every part of the world. The AHP has found use in business, government, social studies, R&D and other domains involving decisions in which choice, prioritization or forecasting is needed.

#### **4.3.1 Thomas L. Saaty**

Thomas L. Saaty, born 1926, Mosul, Iraq, is a professor at the University of Pittsburgh, where he teaches in the Joseph M. Katz Graduate School of Business. He is the inventor, architect, and primary theoretician of the Analytic Hierarchy

Process (AHP), a decision-making framework used for large-scale, multiparty, multi-criteria decision analysis, and of the Analytic Network Process (ANP), its generalization to decisions with dependence and feedback. More recently he generalized the mathematics of the ANP to the Neural Network Process (NNP) with application to neural firing and synthesis.

### **4.3.2 AHP Definition**

According to Saaty definition "The AHP is a simple, mathematically based MCDM tool to model deal complex, unstructured and multi-attribute problems in a hierarchal structure showing the relationships of goal, criteria, sub criteria, and alternatives". AHP not only support decision makers by enabling them to structure complexity and exercise judgment, but it allows them to incorporate both objective and subjective considerations on the decision problems.

### **4.3.3 Uses and applications of AHP**

While it can be used by individuals working on straightforward decisions, the (AHP) is most useful where teams of people are working on complex problems, especially those with high stakes, involving human perceptions and judgments, whose resolutions have long-term repercussions. It has unique advantages when important elements of the decision are difficult to quantify or compare, or where communication among team members is impeded by their different specializations, terminologies, or perspectives.

Decision situations to which the AHP can be applied include:

- Choice – The selection of one alternative from a given set of alternatives, usually where there are multiple decision criteria involved.
- Ranking – Putting a set of alternatives in order from most to least desirable
- Prioritization – Determining the relative merit of members of a set of alternatives, as opposed to selecting a single one or merely ranking them
- Resource allocation – Apportioning resources among a set of alternatives

- Benchmarking – Comparing the processes in one's own organization with those of other best-of-breed organizations
- Quality management – Dealing with the multidimensional aspects of quality and quality improvement
- Conflict resolution – Settling disputes between parties with apparently incompatible goals or positions. (Wikipedia, 2014)

#### 4.3.4 AHP Principles and Axioms

AHP is built on a simple theoretical foundation to determine how much the alternatives contribute to the goal. AHP is based on three basic principles; decomposition, comparative judgments and synthesis. The decomposition principle is applied to structure a complex problem into hierarchy of clusters, sub-clusters, sub- sub clusters and so on. The principle of comparative judgments is applied to construct pairwise comparisons of all combinations of elements in a cluster with respect to the parent of the cluster. The principle of synthesis or hierarchal composition is applied to multiply the priorities of elements in a cluster by the priority of the parent element.

Axioms provide the foundations for any methodology or technique. Saaty has specified four axioms for AHP and these have been described more simply by Forman and Gass (2001).

**The first axiom;** the reciprocal axiom, requires that if A is three times better than B, then B is one third as good as A.

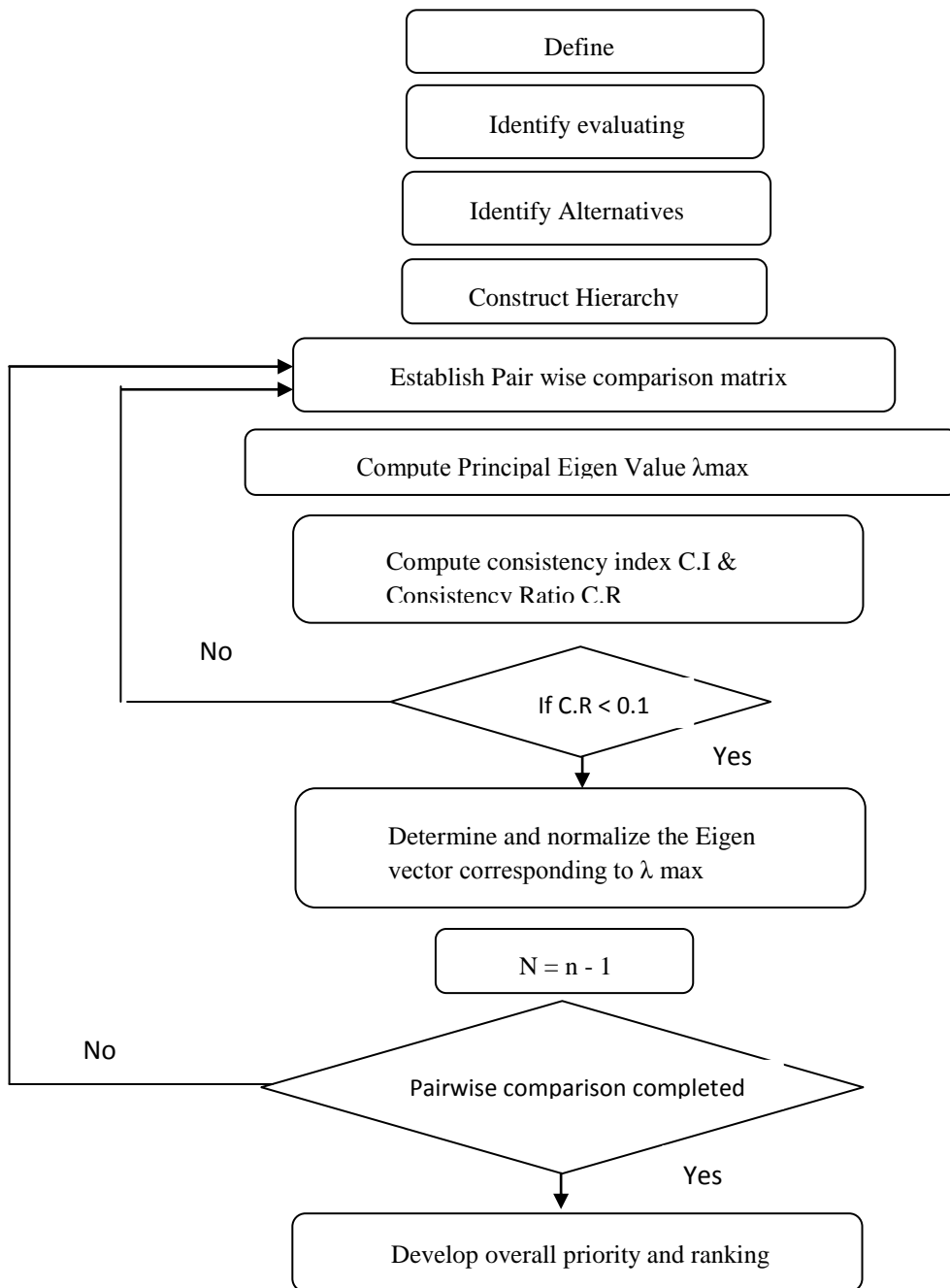
**The second axiom;** the homogeneity axiom, states that the elements to be compared should not differ too much to not have large errors in judgments that lead to a decrease in accuracy and increase in inconsistency.

**The third axiom** states that the priorities of the elements in a cluster do not depend on lower level elements, that means when comparing elements at each level a decision-maker has just to compare with respect to the contribution of the lower-level elements to the upper-level one. This local concentration of the decision-maker on only part of the whole problem is a powerful feature of the AHP.

**The fourth axiom;** the expectation axiom, says that individuals who have reasons for their beliefs should make sure that their ideas are adequately represented for the outcomes to match these expectations. This axiom means that output priorities should not be radically different to any prior knowledge or expectation that a decision maker has. (R. W. Saaty, 1987)

#### **4.3.5 AHP Methodology**

AHP is based on the assumption that when faced with a complex decision, the natural human reaction is to cluster the decision elements according to their common characteristics. It involves building a hierarchy of decision elements and then making comparisons between each possible pair in each cluster. This gives a weighting for each element within a cluster and also a consistency ratio (CR) which is useful for checking the consistency of the data. The methodology of the AHP is explained in figure 4.1.



**Fig (4.1): AHP methodology**

*Source: (Afeefy, 2011)*

### 4.3.6 Hierarchical Structuring of the Problem

In the first stage, the decision maker defines a hierarchical structure representing the problem at hand. A general form of AHP structure is presented in figure (4.2). In the simplest case, the hierarchy has three levels. The first level represents the goal of the decision problem and is analyzed as resulting from the aggregation of evaluation criteria represented by the second level; the last level of the hierarchy involves the alternatives to be evaluated. In more complex cases, there may be more levels, corresponding to splitting criteria into sub-criteria.

The objective or the overall goal of the decision is represented at the top level of the hierarchy. The criteria and sub-criteria contributing to the decision are represented at the intermediate levels. Finally, the decision alternatives or selection choices are laid down at the last level of the hierarchy. The number of the levels in a hierarchy depends on the complexity of the problem being analyzed and the degree of detail of the problem that an analyst requires to solve.

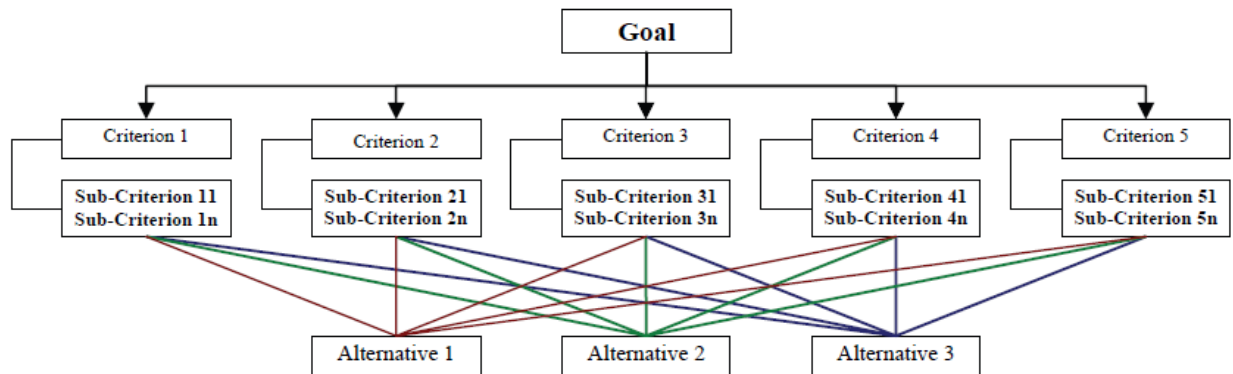


Fig.(4.2): AHP Hierarchy (Saaty, 1980)

### 4.3.7 Performing Pair-wise Comparisons

Once the hierarchy of the problem is defined, the decision-maker performs a series of pair-wise comparisons within the same hierarchical level and then between sections at a higher level in the hierarchy structure to have  $n*(n-1)/2$  comparisons if there are  $n$  criteria. In comparisons, a ratio scale of 1-9 is used to compare any two elements. Table (3.1) shows the measurement scale defined by Saaty (1980). The matrix of pair-wise comparisons is:

$$\underline{A} = \begin{bmatrix} w_1 / w_1 & w_1 / w_2 & w_1 / w_3 & \dots & w_1 / w_n \\ w_2 / w_1 & w_2 / w_2 & w_2 / w_3 & \dots & w_2 / w_n \\ w_3 / w_1 & w_3 / w_2 & w_3 / w_3 & \dots & w_3 / w_n \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ w_n / w_1 & w_n / w_2 & w_n / w_3 & \dots & w_n / w_n \end{bmatrix}$$

**Table (4.1): Saaty's Scale of Importance Intensities [Saaty, 1980].**

Intensity of importance	Definition
1	Equal importance
3	Weak importance of one over another
5	Essential or strong importance
7	Demonstrated importance
9	Absolute importance
2,4,6,8	Intermediate values between the two adjacent judgments

The pairwise comparisons of various criteria are organized into a square matrix as shown in matrix A. The diagonal elements of the matrix are 1. The criterion in the  $i^{th}$  row is better than criterion in the  $j^{th}$  column if the value of element  $(i, j)$  is more than 1; otherwise the criterion in the  $j^{th}$  column is better than that in the  $i^{th}$  row. The  $(j, i)$  element of the matrix is the reciprocal of the  $(i, j)$  element.

The pairwise comparisons depend on subjective judgment without any scientific measurements, so it has been verified that a number of these pairwise comparisons taken together forms a sort of average. This average is calculated through a complex mathematical process using eigen values and eigen vectors. The principal eigen value and the corresponding normalized right eigen vector of the comparison matrix give the relative importance of the various criteria being compared. The elements of the



normalized eigen vector are termed weights with respect to the criteria or sub-criteria and ratings with respect to the alternatives. (Saaty, 1980)

The procedure of pair wise comparison is to evaluate the importance of the criteria and then the preference for the alternatives with respect to each criterion.

The final solution results in the assignment of weights to the alternatives located at the lowest hierarchical level.

### 4.3.8 Synthesis

Once judgments have been entered for each part of the model, the rating of alternative is multiplied by the weights of the sub-criteria and aggregated to get local ratings with respect to each criterion. The local ratings are then multiplied by the weights of the criteria and aggregated to get global ratings. The AHP produces weight values for each alternative based on the judged importance of one alternative over another with respect to a common criterion. The results are then synthesized to obtain rank of the alternatives in relation to the overall goal.

### 4.3.9 Consistency Evaluation

Comparisons made are subjective and AHP tolerates inconsistency through the amount of redundancy in the approach. If this CI fails to reach a required level, then answers to comparisons may be re-examined. The Eigen value technique enables the computation of a consistency measure which is an approximate mathematical indicator of the inconsistencies or intransitivity in a set of pairwise ratings. This consistency measure is called the *CI* which is calculated as:

$$CI = (\lambda_{max} - n) / (n - 1)$$

Where  $\lambda_{max}$  is the maximum eigen value of the judgment matrix. This *CI* can be compared with that of Random Consistency Index, (*RI*). *RI* can take a value between 0 to 1.49 as shown in table (3.2). The ratio derived, *CI/RI*, is termed the *CR*, Saaty suggests the value of *CR* should be less than 0.1, if it is greater than 0.1 (or 10%), the level of inconsistency in the set of ratings is considered to be unacceptable. In this situation, the

evaluation procedure has to be repeated to improve consistency. Sensitivity analysis can be performed to see how well the alternatives performed with respect to each of the objectives as well as how the alternatives are sensitive to changes of the objectives. (Saaty, 1980)

**Table (4.2): Random Consistency Index (RI) [Saaty, 1980]**

<i>n</i>	1	2	3	4	5	6	7	8	9	10
<i>RI</i>	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

#### 4.3.10 AHP Applications

The applications of AHP to complex decision situations have numbered in the thousands, and have produced extensive results in problems involving planning, resource allocation, priority setting, and selection among alternatives. Other areas have included forecasting, total quality management, business process re-engineering, quality function deployment, and the balanced scorecard. Many AHP applications are never reported to the world at large, because they take place at high levels of large organizations where security and privacy considerations prohibit their disclosure. But some uses of AHP are discussed in the literature.

AHP is sometimes used in designing highly specific procedures for particular situations, such as the rating of buildings by historic significance. It was recently applied to a project that uses video footage to assess the condition of highways in Virginia. Highway engineers first used it to determine the optimum scope of the project, then to justify its budget to lawmakers.

Broad areas where AHP has been successfully employed include: selection of one alternative from many; resource allocation; forecasting; total quality management; business process re-engineering; quality function deployment, and the balanced scorecard (Saaty and Vargas, 1991). By scanning the literature different uses of AHP can be found these include:

- Yueh-Hua Lee, (2014) used AHP Analysis as a Decision Framework for Cloud Service Selection for SMEs.

- Seyed Kaveh Jamali, et al , (2014) used AHP for Prioritizing Electronic Commerce Technologies in Iranian Family SME's
- Aries Susanty et al, (2014) used A Fuzzy-AHP Approach for Prioritization of Supplier Selection Criteria in Batik Industry
- Ahmad Ghandour, (2014), used A Fuzzy AHP Approach for Assessing Value Proposition in eCommerce Websites in SMEs in Abu Dhabi”
- Madani Alomar, (2013) used SCOR and AHP Methodology for Improving Performance of SME's.
- Mostafa Hosseinzadeh, et al, (2013), used AHP for Prioritizing Competitive Strategies in Iranian SME's in Severe Economic Sanctions.
- Ravikumar M.M, et al (2013), used AHP& SEM Techniques for Leanness Evaluation in 6 Manufacturing MSME's.
- Bruno Gonçalo Nunes et al, (2012), used AHP for Supporting the Diagnostic of Portuguese SME.
- Patchara Boonyaprasit, et al, (2010), used AHP method to answer; “How SMEs make their decision for choosing an optimal ERP provider”

### **4.3.11 AHP Strengths and Weaknesses**

Several researchers, including Triantaphyllou and Mann, (1990) have pointed out the weakness of AHP as follows

#### **4.3.11.1 Weaknesses of AHP**

- **High inconsistency Ratio (CR) Between the Stakeholders**

The weakness of AHP in assessing the relative importance weights of various criteria, in addition to that the ability of humans to accurately express their knowledge decreases with increasing problem complexity, are considered the two main sources of the high inconsistency ratio (CR). The weakness in assessing the relative importance weights of various criteria results primarily from two limitations, the difficulty of using Saaty's discrete 9-value scale to reflect the belief of decision makers in the relative importance relationship among the various criteria, and the difficulty of identifying the in-between numbers of fuzzy sets. Saaty's discrete 9-value scale method forces decision makers to

select numbers from the finite set  $\{1/9, 1/8, 1/7, \dots, 1, 2, 3, \dots, 7, 8, 9\}$ , contradicting the real world fuzzy memberships of elements in a fuzzy set. In most real world problems, the membership values in a fuzzy set take on continuous values (namely real numbers) rather than discrete numbers. Triantaphyllou and Mann, (1990), found that this limitation can cause extremely high failure rates for AHP.

### **Rank Reversal**

Other drawback sometimes arises with AHP known as 'rank reversal', which is associated with the relative nature of the judgments involved. Here, changing the set of alternatives changes the ranking of all alternatives. If new alternatives are likely to be added to the model after initial analysis, and alternatives are amenable to a direct rating approach (i.e. not so qualitative as to require pair wise comparison), then an approach in which ratings of alternatives are assigned directly (such as the Simple Multi-Attribute Rating Technique or SMART) could be a better choice.

### **Complexity**

AHP is by nature a multi-stakeholder and multi criteria approach to decision-support. Such feature may make using AHP especially for strategic decision making. The first obstacle faced while dealing with such case is lack of agreement on how to identify stakeholder groups, and how to select samples or representatives from them. Stakeholders' interviews sometimes are long. So, a well trained staff is needed to prepare a valid questionnaire as well as explain the questions briefly and obviously. In short, AHP may appear invalid approach in situations where time is crucial.

On the contrary, a number of benefits have been noted with the AHP process in general as a (MCDM) technique.

#### **4.3.10.2 AHP Strengths**

AHP has been applied in a wide variety of decision areas including those related to economy, planning, energy policy, health, conflict resolution, project selection, budget allocation, operations management, benchmarking, total quality management, win-win management, site selection, and education. In addition to being used alone, the AHP has been combined with a number of quantitative analysis techniques such as

LP, goal programming, Data Envelopment Analysis, game theory, conjoint analysis and SWOT analysis.

The benefits of using AHP as follows:

- It formalizes and makes systematic what is largely a subjective decision process and thereby facilitates “accurate” judgments.
- As a by-product of the method, management receives information about the evaluation criteria’s implicit weights.
- The use of computers makes it possible to conduct sensitivity analysis of the results.

The benefits of AHP technique are as follows:

- AHP is an effective management tool. It can handle many alternatives at one time and so permit comparisons to be made. Other popular techniques, such as the Relative Merit Method or Dimensional Analysis, can only handle two alternatives at a time.
- The AHP can handle complex situations where different weights are assigned to the same attributes. Judges’ opinions may vary when determining how important an attribute is. Also, a weight could be assigned to the Judges’ authority in the decision-making process. For instance, the President of a firm may have more say than the Vice President. Therefore, his opinion can be weighted at 0.65 and the Vice President’s at 0.35. This rationale could also be applied to several stockholders.

### **Inclusiveness**

A mixture of quantitative and qualitative information and taking into account multiple stakeholders with conflicted objectives makes AHP to go beyond the evaluation of purely economic consequences and allows non-economic criteria to be assessed on an equal basis, which enhance the results confidence.

### **Flexibility**

The hierarchal nature of AHP makes priority of each element depend on the higher level elements. So, if the surrounded conditions lead to change the judgment of any criteria the final rank of the alternatives will change according to the changes in the ground. So, managers can automatically allocate their resources to accommodate the new circumstances

### **Easiness**

AHP methodology does not depend on cumbersome mathematical concepts. So, it is easy to understand and applied by the majority of people. AHP easiness makes it one of the most decision making widely used tools. In addition to all AHP benefits and drawbacks were mentioned above, the following table, Table (4.3), summarizes other pros/ cons related to it.

**Table (4.3): Pros and Cons of AHP**  
(Source: Alafeefy, 2011)

Pros	Cons
<ul style="list-style-type: none"> <li>• It allows MCDM.</li> <li>• It is applicable when it is difficult to formulate criteria evaluations, i.e., it allows qualitative evaluation as well as quantitative evaluation.</li> <li>• It is applicable for group decision making environments</li> <li>• The inclusion of the managers at every step of the decision analysis in the AHP method gave them a feeling of ownership that nearly insured the implementation of the findings.</li> <li>• Inconsistency measure helps users to know when they make inconsistent judgments, especially if they are working as a group. People want to be</li> </ul>	<ul style="list-style-type: none"> <li>• There are hidden assumptions like consistency.</li> <li>• Repeating evaluations is cumbersome.</li> <li>• Difficult to use when the number of criteria or alternatives is high, i.e., more than 7.</li> <li>• Difficult to add a new criterion or alternative</li> <li>• Difficult to take out an existing criterion or alternative, since the best alternative might differ if the worst one is excluded.</li> </ul>

<p>logically consistent in making decisions.</p> <ul style="list-style-type: none"><li>• Using AHP in group setting results in better communication, leading to clearer understanding and consensus among the members of decision making group, and hence a greater commitment to the chosen alternative.</li></ul>	
---	--

## **Chapter 5**

### **Methodology**

#### **5.1 Introduction**

#### **5.2 Factors (Criteria and Sub-criteria) selection**

#### **5.3 Factors Identification**

##### **5.3.1 Factors Definition**

#### **5.4 Experts Selection**

#### **5.5 Experts Opinions and factors modifications:**

#### **5.6 AHP Software:**



## **5.1 Introduction**

This Chapter introduces the critical success factors, main criteria and their corresponding sub-criteria after examining the previous studies and then designing and distributing the first questionnaire to a group of managers and experts working in the field in order to assess these factors, then the questionnaires were analyzed and minor modifications to the factors upon experts recommendation were made to reach the final set of the main criteria and sub-criteria, finally, a brief description about the software was mentioned.

## **5.2 Factors (Criteria and Sub-criteria) selection**

The first step in MCDM, regardless of the selected method, is the choice of relevant factors, the criteria and the sub-criteria. A lot of studies were conducted in the field of determining, identification or investigating the Barriers or Success factors faced by the SME's and the high-tech startups by using MCDA and AHP. These studies were mainly qualitative and descriptive studies that used descriptive methodologies and classical questionnaires to identify these barriers or success factors for the SME's.

Many researchers study the causes or reasons of the high percent of failure among the SME's and startups and consider these reasons as barriers or challenges, while in the other hand others study the factors that can significantly contribute to the success of the SME's and called them as Critical success factors, in fact, the barriers (failure factors) or the success factors are two faces to one coin, we can simply turn the barrier into a success factor either by avoiding it or using it properly, for example Marketing is considered a barrier in the sense that failed SME's did not give it the needed attention while Marketing is considered a success factor for the SME's which used it properly.

Regarding this study, the factors are investigated as a success point of view rather than failure in order to be motivated study and orient the decision makers to the opportunities rather than the threats.

Previous studies had been surveyed to find out the most important barriers or success factors for the SME's and they are mentioned in table 5.1 as follows.

**Table (5.1): Previous Studies' Factors (Barriers/Success Factors):**

No.	Authors	Title	Barriers/ Success factors
1.	<b>Rana EL-shaqra et al, 2013</b>	“The obstacles which are facing Entrepreneurs to create small Business in Gaza”	<p>The findings indicate that small businesses face the following challenges;</p> <ul style="list-style-type: none"> <li>• Financial constraints.</li> <li>• Marketing challenges.</li> <li>• Human Resources issues.</li> <li>• Information technology.</li> <li>• Rules and regulation.</li> <li>• The Incubator support challengers</li> </ul>
2.	<b>Chengter Ho, et al 2012</b>	“The Key Success Factors of Small Business Innovation and Research of Taiwan Automotive Electronics Industry”	<p>The important factors related to the successfulness of SBIR program are composed of four dimensions and sixteen factors of research and innovation as follows:</p> <p>a. Industry Structure</p> <ul style="list-style-type: none"> <li>• Average firm size</li> <li>• Type of opportunities and the relationship to type of innovation</li> <li>• Globalization of the automotive industry supply and demand-driven factors</li> </ul> <p>b. Political and Regulatory</p> <ul style="list-style-type: none"> <li>• Government to promote the SBIR</li> <li>• Industrial innovation Act legislation</li> <li>• Industry-Academia, government cooperation program</li> </ul> <p>c. Industry/Product life cycles</p> <ul style="list-style-type: none"> <li>• Capital intensity</li> <li>• Advertising intensity</li> <li>• Development of product features</li> <li>• Resource management</li> <li>• Predictive power capacity</li> </ul>

			<p>d. Knowledge Conditions</p> <ul style="list-style-type: none"> <li>• Knowledge acquisition</li> <li>• Knowledge innovation</li> <li>• Knowledge protection</li> <li>• Knowledge share and integration</li> <li>• Diffusion of knowledge</li> </ul>
3.	<b>Arash Sadeghia, et al, 2012</b>	“Developing a fuzzy group AHP model for prioritizing the factors affecting success of High-Tech SME's in Iran: A case study”	<p>This research aims to develop a model to evaluate factors affecting Iranian high-tech SME's success. For this purpose a hierarchal model with 10 main factor and 47 sub factors has been suggested as follows:</p> <p><b>Human resource</b></p> <ul style="list-style-type: none"> <li>• Expertise and competence</li> <li>• Experience</li> <li>• Education</li> <li>• Teamwork skills</li> </ul> <p><b>Strategic</b></p> <ul style="list-style-type: none"> <li>• Strategic planning</li> <li>• Flexibility</li> <li>• Reengineering</li> <li>• Strategic Alliance</li> </ul> <p><b>Entrepreneurs' characteristics</b></p> <ul style="list-style-type: none"> <li>• Experience</li> <li>• Risk Taking</li> <li>• Creativity and innovation</li> <li>• Leadership skills</li> <li>• Managerial style</li> <li>• Family support</li> </ul>

			<p><b>Organizational</b></p> <ul style="list-style-type: none"> <li>• Organizational structure</li> <li>• Organizational culture</li> <li>• Firm Life Cycle</li> <li>• Being a learning organization</li> <li>• Size</li> <li>• up-to-dateness</li> </ul> <p><b>Financial</b></p> <ul style="list-style-type: none"> <li>• The initial Investment</li> <li>• Liquidity</li> <li>• Firms access to financial</li> <li>• Resources</li> </ul> <p><b>Product characteristics</b></p> <ul style="list-style-type: none"> <li>• Product Price</li> <li>• Product quality</li> <li>• Uniqueness of product</li> <li>• After sales service</li> <li>• Easiness of use</li> <li>• Product Life cycle</li> </ul> <p><b>Firm expertise</b></p> <ul style="list-style-type: none"> <li>• Marketing</li> <li>• Human resource management</li> <li>• Finance &amp; accounting</li> <li>• R&amp;D</li> <li>• Customer Service</li> </ul> <p><b>Policies and regulations</b></p>
--	--	--	---

			<ul style="list-style-type: none"> <li>• Relationship with global market Managerial style Government support (the support of domestic products)</li> <li>• Copyright and Intellectual Property Rights</li> <li>• SMEs protection laws</li> <li>• Labor laws</li> </ul> <p><b>Market characteristics</b></p> <ul style="list-style-type: none"> <li>• Demand</li> <li>• Intensity of competition in the industry</li> <li>• Degree of uncertainty in the industry</li> <li>• Access to suppliers</li> <li>• Access to distribution channels</li> </ul> <p><b>Technological</b></p> <ul style="list-style-type: none"> <li>• Access to skilled workforce</li> <li>• Ability to import equipment</li> <li>• relation between industry and university</li> </ul>
4.	<b>Ahmad Z. S. et al, 2012</b>	“Entrepreneurial environments and growth: evidence from Malaysia GEM data”	<p>Some of the important obstacles encountered by entrepreneurs in Malaysia:</p> <ul style="list-style-type: none"> <li>• Inadequate financial support</li> <li>• bureaucracy and inconsistency of government policies</li> <li>• lack of entrepreneurial education at tertiary level</li> <li>• inadequacy of entrepreneurial training</li> </ul> <p>Environmental conditions</p> <ul style="list-style-type: none"> <li>• The physical infrastructures</li> <li>• Services access towards entrepreneurship,</li> <li>• The financial environment related with entrepreneurship.</li> </ul>
5.	<b>Rima M. Bizri, et al 2012</b>	“Barriers to Entrepreneurial Endeavors in a Developing	The findings of this study suggest that there are important barriers to entrepreneurship in developing countries. In Lebanon, the most significant of those barriers are:

		Economy”	<ul style="list-style-type: none"> <li>• The lack of social network.</li> <li>• Lack of external stability.</li> <li>• Risk aversion.</li> <li>• Lack of a business environment conducive to entrepreneurship.</li> </ul>
6.	<b>Monia Lougui, 2010</b>	“Identifying Obstacles Encountered by Swedish Entrepreneurs?” Evidences from the Start- line	<p>The results indicate that the greatest impediments in the process of starting and running a business for Swedish entrepreneurs are:</p> <ul style="list-style-type: none"> <li>• Administrative costs.</li> <li>• Financing.</li> </ul>
7.	<b>Michael Bowen, et al 2009</b>	“Management of Business Challenges Among Small and Micro Enterprises in Nairobi-Kenya”	<p>The findings indicate that SMEs face the following challenges; competition among themselves and from large firms.</p> <ul style="list-style-type: none"> <li>• Lack of access to credit.</li> <li>• Cheap imports.</li> <li>• Insecurity and debt collection.</li> <li>• Relevant training or education is positively related to business success.</li> </ul> <p>The SMEs have the following strategies to overcome the challenges;</p> <ul style="list-style-type: none"> <li>• Fair pricing,</li> <li>• Discounts and special offers.</li> <li>• Offering a variety of services and products.</li> <li>• Superior customer service and continuously improving quality of service delivery.</li> </ul>
8.	<b>K. Lavanya Latha, et al 2009</b>	“Problems of small-scale entrepreneurs in Nellore District”	<p>It is found that the major problems faced by the entrepreneurs are: High price of raw materials.</p> <ul style="list-style-type: none"> <li>• Lack of marketing information and marketing of products.</li> <li>• Competition from small industries and absenteeism of labor.</li> <li>• The majority of the respondents did not want to make any complaint to government agencies.</li> </ul>
9.	<b>Ali Salman</b>	“An Evaluation of SME	Malaysian SMEs still face many domestic and global challenges in achieving economies of

	<b>Saleh, et al 2006</b>	Development in Malaysia”	<p>scale and competing internationally. Among the challenges are:</p> <ul style="list-style-type: none"> <li>• The low level of technological capabilities.</li> <li>• Limited skilled human capital resources.</li> <li>• Low level of technology and ICT penetration.</li> <li>• Low levels of research and development (R&amp;D).</li> <li>• A substantial orientation towards domestic markets.</li> <li>• A high level of international competition.</li> <li>• A high level of bureaucracy in government agencies, and internal sourcing of funds.</li> </ul>
10.	<b>Mahesha Kapurubandara, et al 2006</b>	“Barriers to Adopting ICT and e-commerce with SMEs in Developing Countries: An Exploratory study in Sri Lanka”	<p>The various factors identified as causes for the reticence can be broadly classified as Internal Barriers and External Barriers. Internal Barriers can be resolved within the organization by the organization itself, such as:</p> <ul style="list-style-type: none"> <li>• Owner manager Characteristics</li> <li>• Firm Characteristics</li> <li>• Cost &amp; Return on Investment</li> </ul> <p>While External Barriers need to be addressed either by government intervention or by collaboration of SMEs</p> <ul style="list-style-type: none"> <li>• Infrastructure</li> <li>• Social &amp; Cultural</li> <li>• Political</li> <li>• Legal &amp; Regulatory</li> </ul>
11.	<b>Samya ben Ramadan, 2006</b>	“SMEs Challenges in developing countries from the economic and social perspective- Algeria as a case study”	<p>The findings of this study indicate that for development of industrial SME’s, they face many types of barriers which are:</p> <ul style="list-style-type: none"> <li>• Economic Barriers.</li> <li>• Social Barriers.</li> <li>• Cultural barriers.</li> </ul>

12.	<b>Schaul Chorev et al, 2006</b>	“Success in Israeli High-Tech Start-Ups; Critical Factors and Process”	<p>The study found that success factors could be grouped as critical or as important.</p> <ul style="list-style-type: none"> <li>• The first group categorized the idea, strategy, the core team’s commitment, expertise and marketing as critical.</li> <li>• Important factors were deemed to be management, customer relationships and research and development.</li> <li>• The least important factors proved to be those external to the firm, the economy, politics and the general business environment.</li> </ul>
13.	<b>Aristidis Bitzenis, et al, 2005</b>	“Obstacles to entrepreneurship in a transition business environment” The Case of Albania	<p>The most important obstacles faced by entrepreneurs in Albania include:</p> <ul style="list-style-type: none"> <li>• Unfair competition.</li> <li>• Changes in taxation procedures.</li> <li>• Lack of financial resources and problems related to public order.</li> <li>• Bureaucracy and corruption do not appear to represent significant barriers to entrepreneurship.</li> </ul>
14.	<b>LowK. Ch. P.,2005</b>	“Cultural obstacles in growing entrepreneurship: case study in Singapore”	<p>Four obstacles are identified as the following:</p> <ul style="list-style-type: none"> <li>• Being over-compliant.</li> <li>• Too left-brained.</li> <li>• Over-pampered.</li> <li>• Afraid of failure.</li> </ul>



### 5.3 Factors Identification

After surveying the previous mentioned studies, a conclusion can be made that the main criteria for prioritizing the main success factors for ICT enterprises in Gaza are mainly eight criteria which are Human Resources, Entrepreneurs' characteristics, Financials, Product/Service characteristics, Marketing, Business Incubators' roles, Policy and Policies and finally Organization Characteristics with corresponding 20 sub-criteria. These criteria and sub-criteria are adopted by the researcher according to the literature and according to what seems applicable for the situation of the Gaza Strip ICT sector. Table (5.2) shows the Critical Success Factors, Main Criteria and sub-criteria for each main criterion adopted by the researcher from the literature review.

**Table (5.2): The Main Criteria and sub-criteria adopted by the researcher**

#.	Main criteria	Sub criteria
1.	Human Resources	1. Experience
		2. Education
		3. Managerial performance and skills
2.	Entrepreneurs' Characteristics	4. Personal traits (Creativity, Leadership)
		5. Risk Taking
		6. Family support
3.	Financials	7. The initial Investment
		8. Finance & accounting
4.	Product/Service Characteristics	9. Product/Service Price & Quality
		10. Customer during & after sales service
5.	Marketing	11. Marketing
		12. Intensity of competition
		13. R&D
6.	Business Incubators' Roles	14. Integrate SME's with market and society
		15. Training and Consultancy Provided
7.	Policy and Policies	16. Political and economical stability
		17. the governmental support of domestic products
		18. Copyright and Intellectual Property Rights
8.	Organization Characteristics	19. Organizational Structure
		20. Firm's Established year

### 5.3.1 Factors Definition

The definition of each criterion and associated sub-criteria are discussed as follows:

**1. Human Resources:** the personnel of a business or organization, regarded as a significant asset in terms of skills and abilities. Human resource management is something that we all must do if we are going to be successful. The reason is simple; human resources are the most important assets we have in most small businesses, Table 5.3) depicts the questions asked to the experts about the importance of each sub-criteria in the Human Resources Sub-Criteria:

**Table (5.3): Human Resources sub-criteria interview questions**

Main criteria	Sub criteria	Interview Questions
Human Resources	1. Experience	To what extent would you consider the entrepreneurs' experience important for the success of their startup?
	2. Education	Does the university certificate, 4-year or 2 year certificate contribute to the success of the SME's?
	3. Managerial performance and skills	Are the managerial skills important for the success or failure of the startups?

**2. Entrepreneurs' characteristics:** it is the set of personal traits and attributes that distinguish the individuals in specific and cannot be shared nor taught, Research indicates that most successful entrepreneurs share certain personal attributes, including: creativity, dedication, determination, flexibility, leadership, passion, self-confidence, and smarts and each one of those characteristics is vital for the entrepreneurs that may affect in the failure or success of their business, table 5.4 show the questions asked to the experts in this criterion.

**Table (5.4): Entrepreneurs' characteristics sub-criteria interview questions**

Main criteria	Sub criteria	Interview Questions
Entrepreneurs' characteristics	4. Personal traits (Creativity, Leadership)	Do personal traits in general and Creativity and leadership in specific affect the success or failure of the ICT SME's?
	5. Risk Taking	Do you consider a risk-taker entrepreneur an important factor!?
	6. Family support	Does the "family Support" play an important role in the success of the SME's in Gaza giving the job-dominated thinking of the fathers?

**3. Financials:** It is meant to be the financial and accounting performance before and after establishing the enterprises, Small businesses face financial difficulties because of its size, lack of guarantees and because of the timeliness and the lack of credit record. New businesses rarely show a profit in the early months of operation. Generating sales takes time, and receipts are not usually sufficient to offset startup costs and monthly expenses. Therefore, entrepreneurs need to estimate how much money they need and then raise that amount to transform their dream into a reality, table 5.5 show the questions asked to the experts in this criterion.

**Table (5.5): Financials sub-criteria interview questions**

Main criteria	Sub criteria	Interview Questions
Financials	7. The initial Investment	Do you think that the amounts granted by incubators or any other funding agencies contribute to the success of the starting business?
	8. Finance & accounting	Do you think that financial management and good budgeting, spending and bookkeeping skills are important to keep the startups functioning?

**4. Product/service characteristics:** it is the main and distinguished specifications of the products and/or services provided by the enterprises, these characteristics are considered a vital dimension for its continuity and progress, table 5.6 shows the questions asked to the experts regarding this criterion.

**Table (5.6): Product/Service characteristics sub-criteria interview questions**

Main criteria	Sub criteria	Interview Questions
Product/Service characteristics	9. Product/Service Price & Quality	Do you think that the quality and the price of the products or Services provided by the startups are important to their success!?
	10. Customer during & after sales service	To what extent do you think that customer service, during and after sale can contribute to the success of the high-tech startups?

**5. Marketing:** marketing is a set of activities that creates value, on the long-run, both for the business and for the client. From this perspective, the marketing effort is considered as a long-term investment, in order to generate a bond between the client and the enterprise, its importance is widely-recognized, table (5.7) shows the questions asked to the experts regarding the marketing sub-criteria.

**Table (5.7): Product/Service characteristics sub-criteria interview questions**

Main criteria	Sub criteria	Interview Questions
Marketing	11. Marketing	Is marketing important for the success of SME's?
	12. Intensity of competition	Could the competition affect the growth positively or negatively? In what sense? To what extent?
	13. R&D	As an expert in the ICT sector, Do you consider the Research and Development process an important factor for the success of the high-tech startups?

**6. Incubator roles:** Business Incubators (BIs) are institutions which support startups in terms of physical space, marketing, capital and investment, administrative services, technology intensive and networking and connections to allow them to survive the critical startup phase. They have been established worldwide as tools for company creation and small businesses support, table (5.8) shows the questions asked to the experts corresponding to the incubators main roles contributions.

**Table (5. 8): Incubator roles sub-criteria interview questions**

Main criteria	Sub criteria	Description Questions
Business Incubator roles	14. Integrate SME's with market and society	One of the most important roles for BIs is to open new horizons for the entrepreneurs and enterprises, to what extent do you believes that role is significant in the success of the enterprises?
	15. Training and Consultancy Provided	Do the oriented managerial and technical training and consultancy services important for the success

**7. Policy and Policies:** it is any governmental measure, policy or intervention that seeks to change the behavior of individuals or groups towards encouraging the startups negatively or positively, so it can either give people rights or restrict their behavior, table (5.9) shows the questions regarding Policy and Policies criterion which asked during the interview.

**Table (5. 9): Policy and Policies sub-criteria interview questions**

Main criteria	Sub criteria	Description Questions
Policy and Policies	16. Political and economical stability	To what extent the political and economical situation affects the ICT sector in Gaza?
	17. the governmental support of domestic products	Does the governmental policy in supporting the domestic products and services contribute to the success of the enterprises?
	18. Copyright and Intellectual Property Rights	If the government save the copyright and intellectual property for the entrepreneurs would that motivate them for more inventions and encourage them to succeed and gain more profit?

**8. Organization Characteristics:** It is the main characteristics of the organization or enterprise that may affect its success/failure, table (5.10) shows the questions asked for the organizational criterion during the interview.

**Table (5. 10): Organization Characteristics sub-criteria interview questions**

Main criteria	Sub criteria	Description Questions
Organization Characteristics	19. Organizational Structure	Is it essential for the ICT enterprises to have clear organizational levels in order to succeed?
	20. Firm's Established year	Does the experience of the enterprise itself affect the success of it?

Then, these previous 8 criteria and 20 sub-criteria were arranged in a questionnaire (Appendix A), after that the experts' opinions will be surveyed by filling this questionnaire. The experts can respond whether the criteria/sub criteria is considered a critical success factor for the success of the high-tech enterprises or not, and to what extent, then opening the area for the expert to modify and add any criteria and/or sub

criteria which he/she deems critical or important and not mentioned in the questionnaire. The analysis of the questionnaires was made to identify final set of criteria/sub criteria according to the experts' points of view.

#### **5.4 Experts Selection:**

Experts were selected very carefully to assure effective results for the research, giving that the ICT sector is considered relatively new field in Gaza, that makes it a little bit more difficult to find experts with strong background and specialized in the theoretical and practical part of the ICT enterprises in Gaza.

Nine experts were selected based on the researcher past experience, since he is working in the field, and the main selection criteria for the experts was to cover of all fields concerned in the ICT enterprises support like the Academic, Private, Public, International Non-governmental and Non Governmental organizations, in addition to assure a variety of university degrees and years of experience to assure a certain level of direct contacts with entrepreneurs, so, the panel of jury were experts, managers, consultants and trainers in the ICT field as shown in Appendix C.

#### **5.5 Experts Opinions and factors modifications:**

As mentioned in the previous section, the experts were selected carefully to cover all concerned fields, so it is expected to have a variety in the opinions and judges presented for main two reasons, the background and experience differences from one side, and the huge amount of subjectivity involved in this kind of questionnaires for factors selection from the other side.

The experts' opinions were only concentrated on the importance of the stated 8 criteria and 20 sub criteria then they were given the floor to add any criteria or sub-criteria they deem critical or important to the success of the ICT enterprises and not mentioned in the questionnaire, 3 of the questionnaires were distributed electronically for the reasons of lack of free time of the experts to meet or for the reasons of being outside Gaza in the current time, while the other 6 experts were personally interviewed to have deep understanding and conversation about the importance of each factor.

The opinions of the experts were analyzed with the help of Microsoft Office Excel sheets using the likert scale (5: very important, 4: important, 3: Moderately important, 2: little important and 1: Not important), and then the sum, average and percent were calculated for each sub-criteria as shown in table (5.12) as follows.

Main criteria	Sub criteria	Mohammed	Saleem	Said	Yousef	Al-Tarik	khaled	Tarik	Mamoun	El-franji	sum	average	%
Human Resources	Experience	5	5	4	5	5	5	5	3	5	42	4.667	93%
	Education	4	4	2	3	3	4	3	4	3	30	3.333	67%
	Managerial performance and skills	5	5	4	4	4	4	4	5	4	39	4.333	87%
Entrepreneurs' characteristics	Personal traits (Creativity, Leadership)	5	4	5	5	5	4	5	5	5	43	4.778	96%
	Risk Taking	5	5	4	5	2	5	4	5	4	39	4.3333	87%
	Family support	4	3	3	4	3	1	3	3	2	26	2.889	58%
Financial	The initial Investment	4	5	2	3	4	4	2	3	4	31	3.444	69%
	Finance & accounting	4	5	4	3	3	3	3	3	3	31	3.444	69%
Product/Service characteristics	Product/Service Price & Quality	5	5	3	4	5	5	5	4	4	40	4.4444	89%
	Customer during & after sales service	4	5	5	5	4	4	4	5	5	41	4.556	91%
Marketing	Marketing	4	5	5	5	5	4	5	5	5	43	4.778	96%
	Intensity of competition	4	5	4	4	4	5	3	4	3	36	4	80%
	R&D	4	5	5	4	4	2	4	4	4	36	4	80%
Incubator roles	Integrate SME's with market and society	4	5	5	5	5	5	3	3	4	39	4.333	87%
	Training and Consultancy Provided	5	4	5	4	4	4	5	4	4	39	4.333	87%
Policy and Policies	Political and economical stability	5	4	4	5	4	5	4	3	3	37	4.111	82%
	the governmental support of domestic products	4	5	5	4	5	4	4	2	4	37	4.111	82%
	Copyright and Intellectual Property Rights	4	4	3	4	4	4	3	3	5	34	3.778	76%
Organization Characteristics	Organizational Structure	4	4	4	2	4	3	3	4	3	31	3.444	69%
	Firm's Established year	4	4	2	3	2	4	1	3	3	26	2.889	58%
	sum	87	91	78	81	79	79	73	75	77			
	Average	4.35	4.55	3.9	4.05	3.95	3.95	3.65	3.75	3.85			
	Percent	87%	91%	78%	81%	79%	79%	73%	75%	77%			

**Table (5.11): The experts' ratings for the suggested criteria and sub-criteria**



As shown in table (5.11), From the experts' points of view, Personal traits (Creativity and Leadership) and Marketing are considered the most important factors with 96% for each, while in the other hand, they give only 58% to the Firm's established year and Family support for each, all in all, the experts rated all the 20 sub-criteria above 50%, or more precisely 58%, which means that all stipulated sub-criteria are important, whether extremely important such as the personal traits and Marketing or just normal important such as the Firm's established year and the family support.

As notices from table (5.11), the ratings of the experts were relatively consistent with each other, no one single sub-criteria get the extreme ratings of very important (5) and not important (1) in the same time, in fact, the only two sub-criteria which get rating 1, not important, where the lowest two sub-criteria which are the firms' established year and the family support as mentioned before.

The experts suggest some interesting and critical sub-criteria to be included in the already mentioned main criteria like Team working to be included in the Entrepreneurs' characteristics main criteria (suggested by Mr. Tarik Thabet, Mr. Tarik Esleem and Mr. Saeed Abdelrahim) and in the same direction, Mr. Alefranji mention the collaboration sub-criteria which can be rephrased as good team working skills, then it was added.

Two experts, Mr. Tarik Esleem and Mr. Youssif, mentioned the uniqueness of the products or services themselves as an important sub-criterion to be taken into consideration, and it was added to Product/Service main criteria

Mr. Yousef mention the mentoring as a very important role that incubators provide for the startups, and it is added to no. 15 sub-criterion and not as a separate sub-criterion since it still considered a service provided by the incubators and categorized in the same parcel.

Some experts had a strong argument that the Family Support sub-criterion should not be included in Entrepreneurs' Characteristics, since these characteristics are considered as internal features of the individuals themselves, while in the other hand the Family support is the an outside morale and emotional support that the entrepreneurs get from outside party, mainly the family members, friends or surrounding mates, so it was

excluded for the reason of this argument and since it gets the lowest percentage of 58%, furthermore, the researcher with guidance from the supervisor recommend to separate each personal traits in a separate sub-criterion since it is important from one hand, in the other hand it is more easy for the experts to set the pair wise comparison between each one of them.

In contrary, the other lowest sub-criterion is maintained since by its removal, the whole criteria is going to be removed, but the researcher and the supervisor recommend to keep it.

For the main Criteria modifications, two experts, Mr. Alefranji and Mr. Abdelrahim, suggest to rename the policy and policies main criterion to be “Environmental Conditions” and to include “the Governmental and Non-Governmental Support” and the “Working Conditions and Environment” along with the suggested sub-criteria, since they are extremely important in their point of view, this suggestion was taken into consideration after referring to the previous studies and was mentioned by Ahmad Z. S. et al, 2012.

Finally, some experts suggested already included sub-criterion like Project Management, Planning and time management skills which can be generalized in the Managerial performance and skills mentioned in sub-criterion no. 3, others suggested the budgeting and good resource allocation which is mentioned in the financing and accounting sub-criterion no. 8.

After taking all the previous-mentioned reasonable suggestions into consideration, the modified main criteria and sub-criteria table (5.12), with 8 main criteria and 23 sub-criteria, is as follows:

**Table (5.12): The Final Criteria and Sub-criteria**

#.	Main criteria	Sub criteria
1.	Human Resources	1. Experience
		2. Education
		3. Managerial performance and skills
2.	Entrepreneurs' characteristics	4. Creativity
		5. Leadership
		6. Risk Taking
		7. Team Working
3.	Financials	8. The initial Investment
		9. Finance & accounting
4.	Products/Service characteristics	10. The uniqueness of the Products/Services
		11. Product/Service Price & Quality
		12. Customer during & after sales service
5.	Marketing	13. Marketing
		14. Intensity of competition
		15. R&D
6.	Incubators roles	16. Integrate SME's with market and society
		17. Training, Consultancy and Mentoring Provided
7.	Environmental Conditions	18. Political and economical stability
		19. Governmental and non-governmental support
		20. Working conditions/environment
		21. Copyright and Intellectual Property Rights
8.	Organization characteristics	22. Organizational Structure
		23. Firm's Established year

After that, these final criteria and sub criteria can be used in the AHP model to compare and get the local and global weights of each criterion and sub criteria to rank and prioritize the Critical Success Factors for the ICT enterprises in Gaza.

## **5.6 AHP Software:**

Expert Choice (EC) is a decision-making software that is based on multi-criteria decision making which implements the Analytic Hierarchy Process (AHP) and has been used in fields such as manufacturing, environmental management and agriculture and it is created by Thomas Saaty and Ernest Forman in 1983, the software is supplied by Expert Choice Inc.

EC program helps a decision-maker to examine and resolve problems involving multiple evaluation criteria. The software uses the AHP methodology to model a decision problem and evaluate the relative desirability of alternatives.

For this research model, Expert Choice, Version 11.5, was employed to prioritize the critical success factors of the ICT enterprises in Gaza.

# **Chapter 6**

## **Results and Analysis**

### **6.1 Introduction**

### **6.2 Factors Definition**

### **6.3 AHP Model Applying**

#### **6.3.1 Hierarchical structure of the problem**

#### **6.3.2 Pair Wise Comparison Conducting**

##### **6.3.2.1 Main criteria pair wise comparison**

##### **6.3.2.2 Sub-Criteria Pair wise Comparison**

- 1. Human Resources Sub-criteria**
- 2. Entrepreneurs' Characteristics:**
- 3. Financials:**
- 4. Product/Service Characteristics**
- 5. Marketing:**
- 6. Incubators' Roles**
- 7. Environmental Conditions**
- 8. Organization Characteristics**

### **6.4 Analysis of Results**

#### **6.4.1 Main Criteria Ranking Analysis**

#### **6.4.2 Sub-Criteria Ranking Analysis**

#### **6.4.3 Inconsistency Analysis**

#### **6.4.4 Sensitivity Analysis**Error! Bookmark not defined.

- 6.4.4.1 Entrepreneurs' Characteristics**
- 6.4.4.2 Marketing**
- 6.4.4.3 Human Resources**
- 6.4.4.4 Products/Service Characteristics**
- 6.4.4.5 Financials**
- 6.4.4.6 Incubators' Roles**
- 6.4.4.7 Environmental Conditions**
- 6.4.4.8 Organization Characteristics**
- 6.4.4.9 Sensitivity Analysis Summary**

## **6.1 Introduction**

This chapter details the main results and the analysis of results of this research, after getting the factors in the final set, the estimates of the pairwise comparison were entered to the software, then weights of the main criteria and sub criteria were obtained, so the global weights could be calculated and ranked. Three types of analysis conducted, main criteria analysis, sub-criteria analysis and consistency analysis, finally, the results were subjected to 10% increase to examine the change in ranks for each main criteria and associated sub-criteria.

## **6.2 Factors Definition**

The process of surveying the previous related studies which was explained in chapter five and summarized in table 5.1, then the distribution and analysis of the first questionnaire resulted in an identification and definition of eight main criteria which are: Human Resources, Entrepreneurs' characteristics, Financials, Products/Service characteristics, Marketing, Incubators roles, Environmental Conditions and finally Organization characteristics with 23 sub criteria as shown in table 6.1 These criteria were arranged in a questionnaire 2 (Appendix B) to which was distributed to the experts to get a final ranking of criteria and sub criteria.

**Table (6.1): The final criteria and sub-criteria**

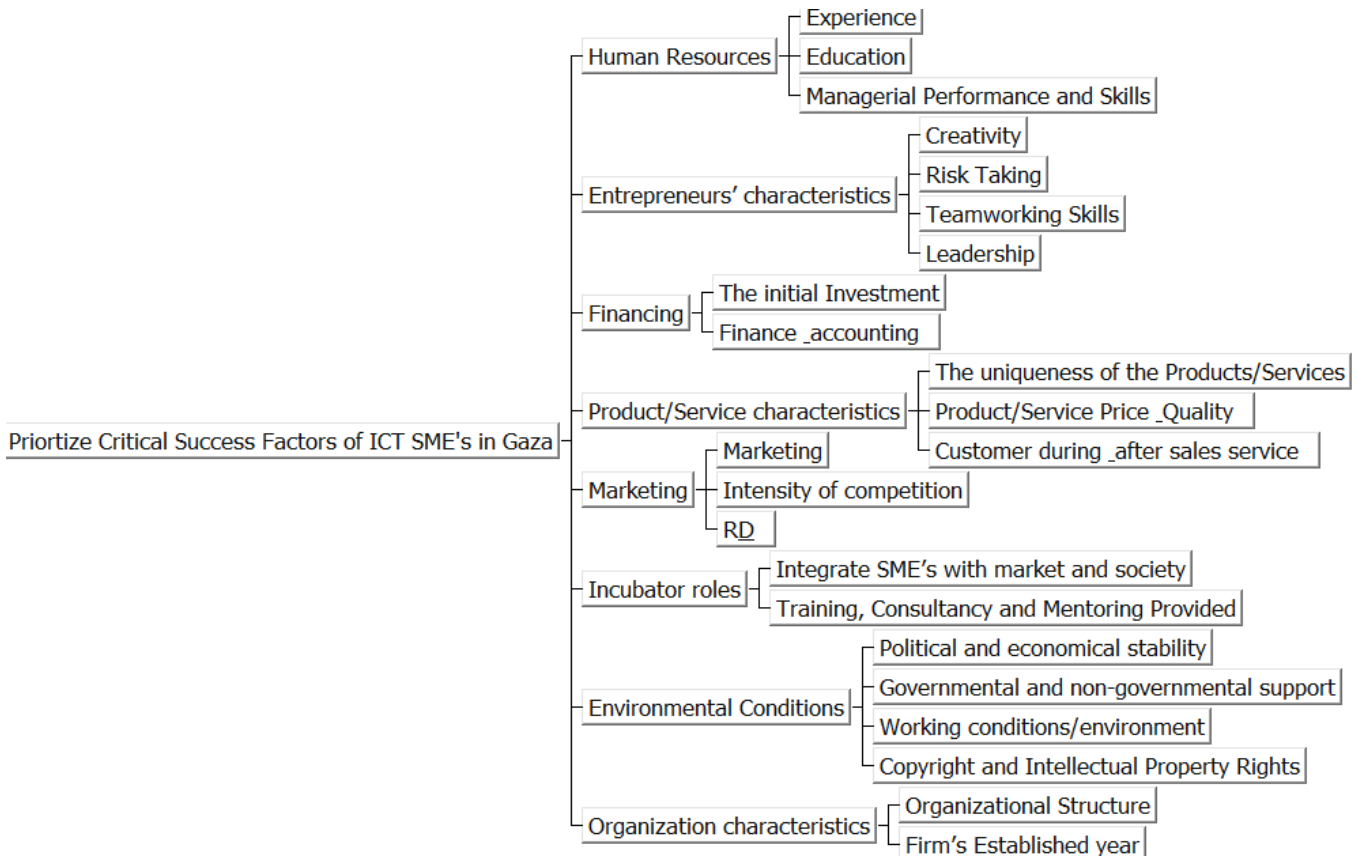
#.	Main criteria	Sub criteria
1.	Human Resources	1. Experience
		2. Education
		3. Managerial performance and skills
2.	Entrepreneurs' characteristics	4. Creativity
		5. Leadership
		6. Risk Taking
		7. Team Working
3.	Financials	8. The initial Investment
		9. Finance & accounting
4.	Products/Service characteristics	10. The uniqueness of the Products/Services
		11. Product/Service Price & Quality
		12. Customer during & after sales service
5.	Marketing	13. Marketing
		14. Intensity of competition
		15. R&D
6.	Incubators roles	16. Integrate SME's with market and society
		17. Training, Consultancy and Mentoring Provided
7.	Environmental Conditions	18. Political and economical stability
		19. Governmental and non-governmental support
		20. Working conditions/environment
		21. Copyright and Intellectual Property Rights
8.	Organization characteristics	22. Organizational Structure
		23. Firm's Established year

### **6.3AHP Model Applying**

As the basic requirements for AHP including the goal, criteria and sub criteria are identified, the application of the process is as explained in the following steps:

#### **6.3.1 Hierarchical structure of the problem:**

The final structure of the problem including the goal, criteria, sub criteria and alternatives is now ready to be evaluated to achieve a final ranking of industrial sectors. The hierarchical structure of the study given by the EC software is shown in figure 6.1.



**Fig (6.1): Hierarchal structure of the AHP model by EC Software**

### 6.3.2 Pair Wise Comparison Conducting:

The AHP process makes it possible to incorporate judgments on intangible qualitative criteria alongside tangible quantitative criteria. The method utilizes pair wise comparisons of main criteria as well as pair wise comparisons of the multiple sub-criteria for each main criterion. The use of such pair wise comparisons allows the decision-maker to focus on the comparison of just two objects, which makes the observation as free as possible from extraneous influences. Additionally, pair wise comparisons generate meaningful information about the decision problem, improving consistency in the decision-making process, especially if the process involves group decision-making.

To conduct pair wise comparison, two-section questionnaire was designed and distributed among the experts and managers working in the field. (Appendix B). Pair wise comparison results obtained from each questionnaire was entered into Excel sheet to calculate the sum and average, then the average ratings were entered to the AHP

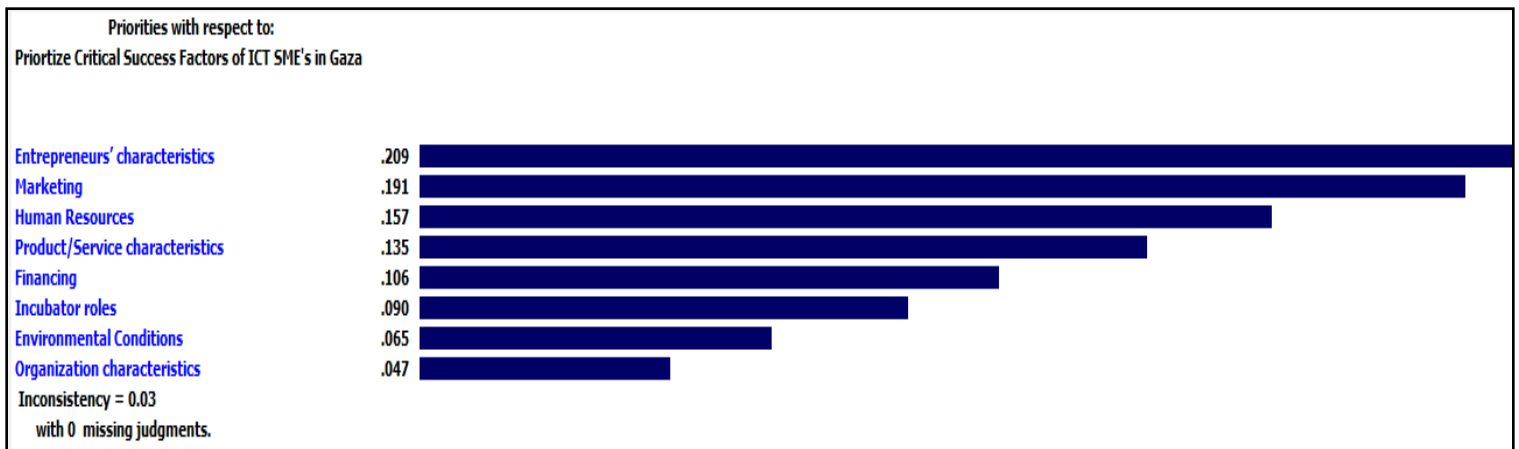


software, The Expert Choice version 11.5 (E.C 11.5), and then the Consistency Ratio (CR) and the relative weights vector of main criteria and sub criteria with respect to main goal were calculated.

The CR for each pair wise comparison must be less than 0.1 to be consistent and all the CR for all the main criteria and sub-criteria was less than 0.1, which means that the ratings were consistent and the experts opinions were consistent and homogenate with itself as well, then the relative weights vector were calculated.

### 6.3.2.1 Main criteria pair wise comparison:

After constructing the general model and entering the averaged experts' judgments of main criteria pair wise comparison to the EC, the results shown in figure 6.2 are obtained.

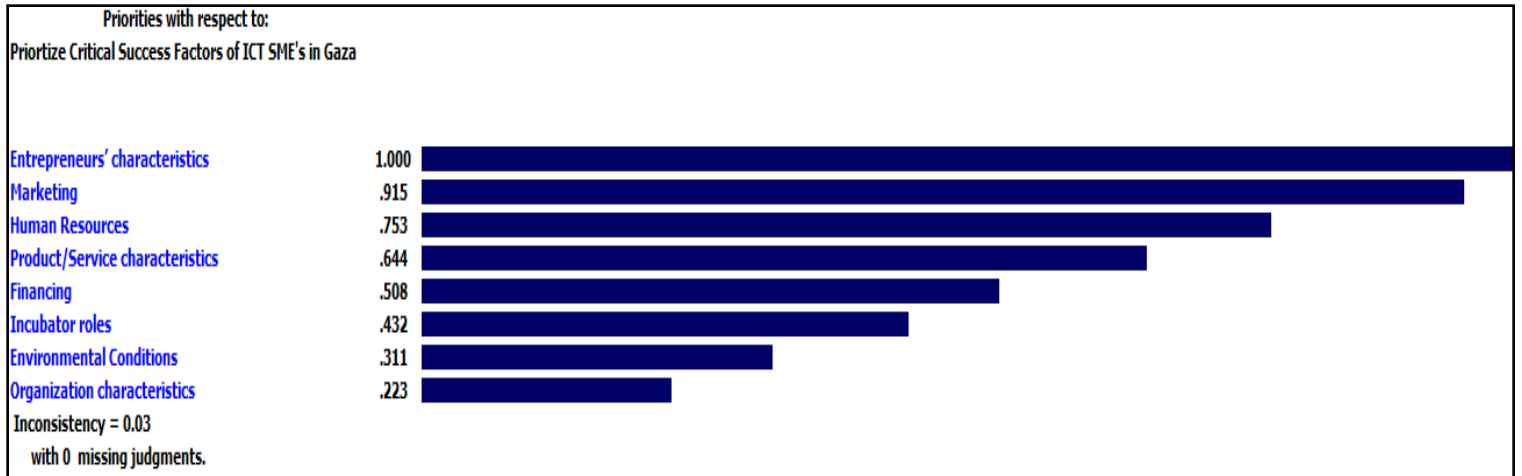


**Fig. (6.2): Main Criteria Pair Wise Comparison Results**

As we can see in Fig.6.2, the Entrepreneurs' Characteristics get the highest priority with respect to goal with a percentage of 20.9%, not far away from the second place, marketing, which has 19.1%, in the other hand the Environmental conditions and Organizational Structure get the lowest percentages of 6.5% and 4.7% respectively.

Remarkably, the Consistency Ratio (CR) or the level of inconsistency for the main criteria pair wise comparison equals 0.03 which is less than 0.1 or (10%), which is considered acceptable and the ratings are consistent.

For more simplicity, the normalized ranks of the main criteria can be calculated by the software; it assigns 100% for the no. 1 criterion then recalculates the percentages of the other criterion with relative to the normalized (100%) first ranked criterion as shown in figure 6.3



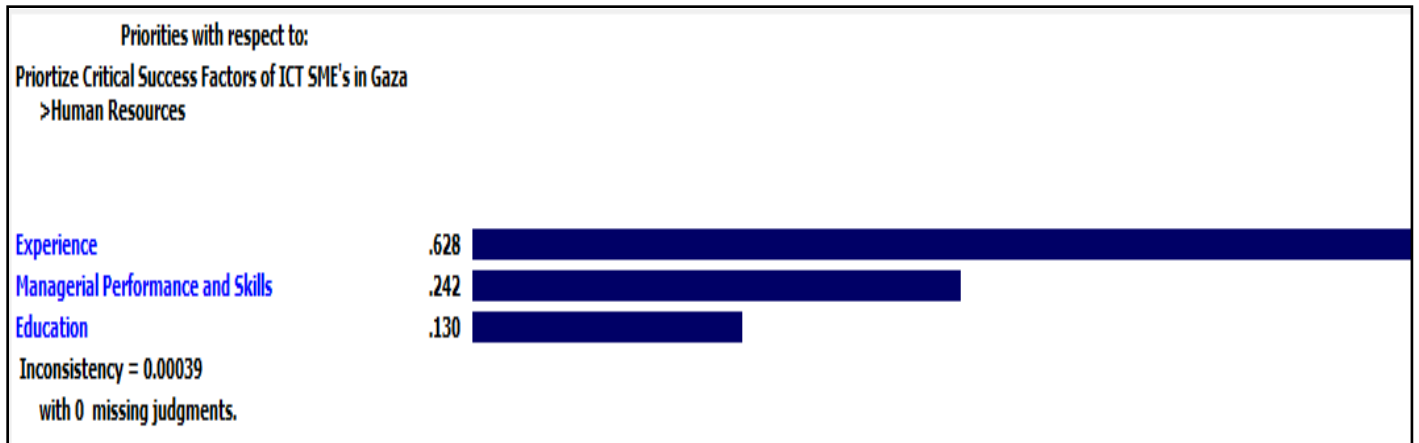
**Fig. (6.3): Main Criteria Pair Wise Comparison normalized percentage**

As shown in Fig. 6.3, the Entrepreneurs' characteristics gains the highest with normalized percentage of 100%, then the Marketing criterion with 91.5%, Human Resources, Product/Service characteristics, Financing and the incubators roles get 75.3%, 64.4%, 50.8% and 43.2% percent respectively, additionally, Environmental Conditions and Organizational characteristics get the lowest percentages with 31.1% and 23.21% in a row.

### 6.3.2.2 Sub-Criteria Pair wise Comparison

#### 1. Human Resources Sub-criteria

The experts' judgments of human Resources sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal as shown in figure 6.4.

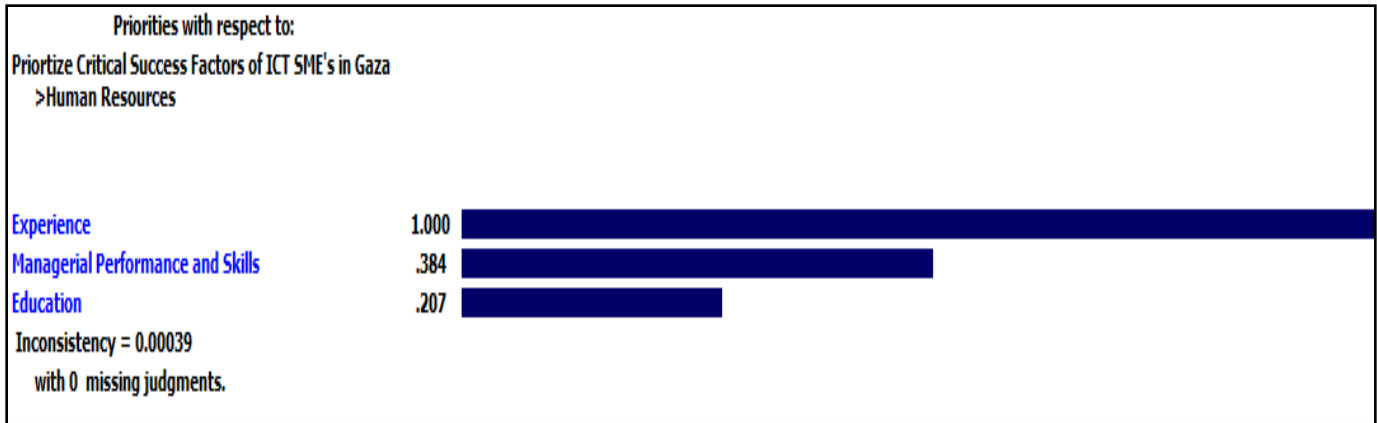


**Fig. (6.4): Human Resources sub-criteria Pair Wise Comparison**

As shown in Fig. 6.4, the experience sub-criterion get the highest rate of 62.8%, then the managerial skills and performance of the entrepreneurs with 24.2%, and the lowest sub-criterion was the Education with percent of 13%, and was expected already since many experts argue that education is not very important for the success of enterprises.

Furthermore, the Consistency Ratio (CR) or the level of inconsistency for the Human Resources sub-criteria pair wise comparison equals 0.00039 which is less than 0.1 or (10%), and that's considered acceptable and the ratings are consistent.

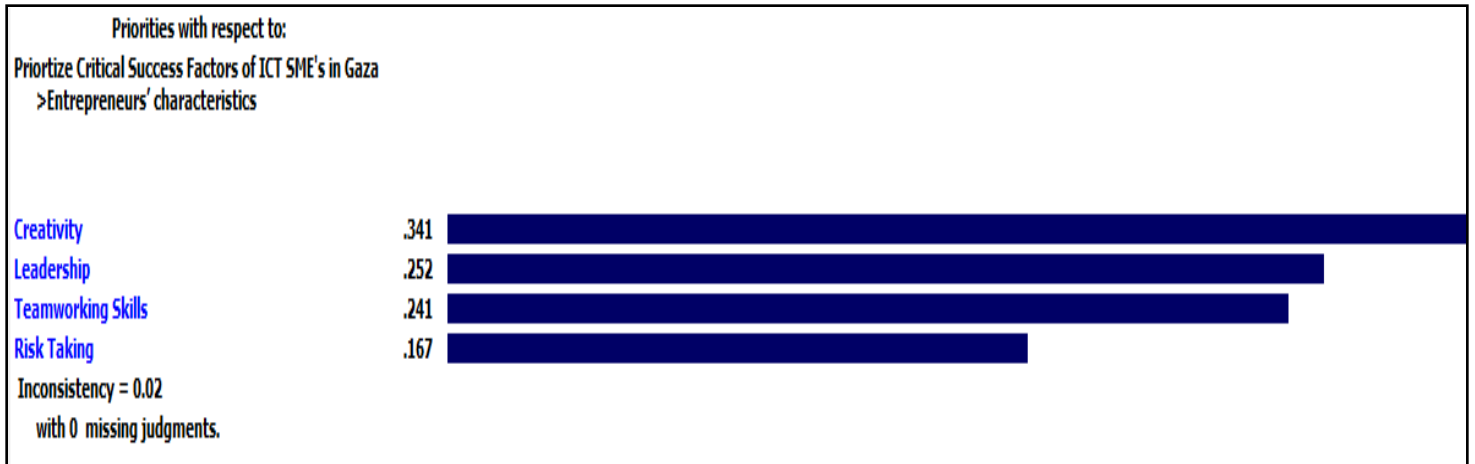
Figure 6.5 shows the normalized results of the Human Resources sub-criteria, Experience gets 100% and relatively, Managerial performance and skills and Education get 38.4% and 20.7% respectively.



**Fig.(6.5): the normalized results of the Human Resources sub-criteria**

## 2. Entrepreneurs' Characteristics:

The experts' judgments of Entrepreneurs' characteristics sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal as shown in figure 6.6.

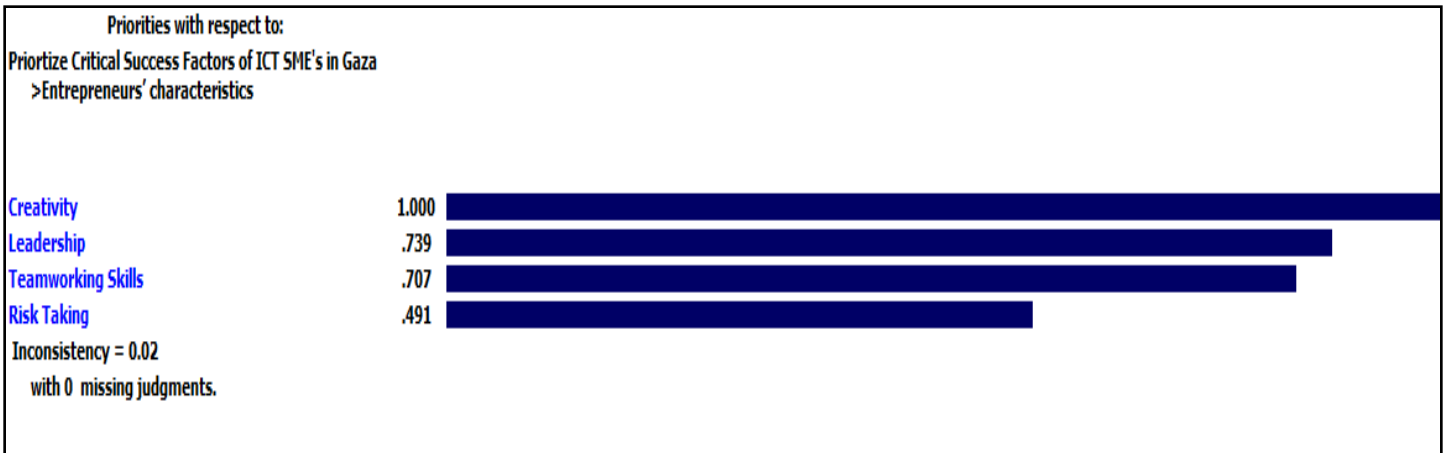


**Fig. (6.6): Entrepreneurs' Characteristics sub-criteria Pair Wise Comparison**

As shown in Figure 6.6, the experts considered the creativity criterion is the most important one to the goal with percentage of 34.1%, and then the Leadership characteristics come in second place with 25.2%, Team working skills in third place with 24.1% not far away of the second position, finally the Risk Taking gets in the lowest percent of 16.7%.

Additionally, the Consistency Ratio (CR) or the level of inconsistency for the Entrepreneurs' Characteristics sub-criteria pair wise comparison equals 0.02 which is less than 0.1 or (10%), and that's considered acceptable and the ratings are consistent.

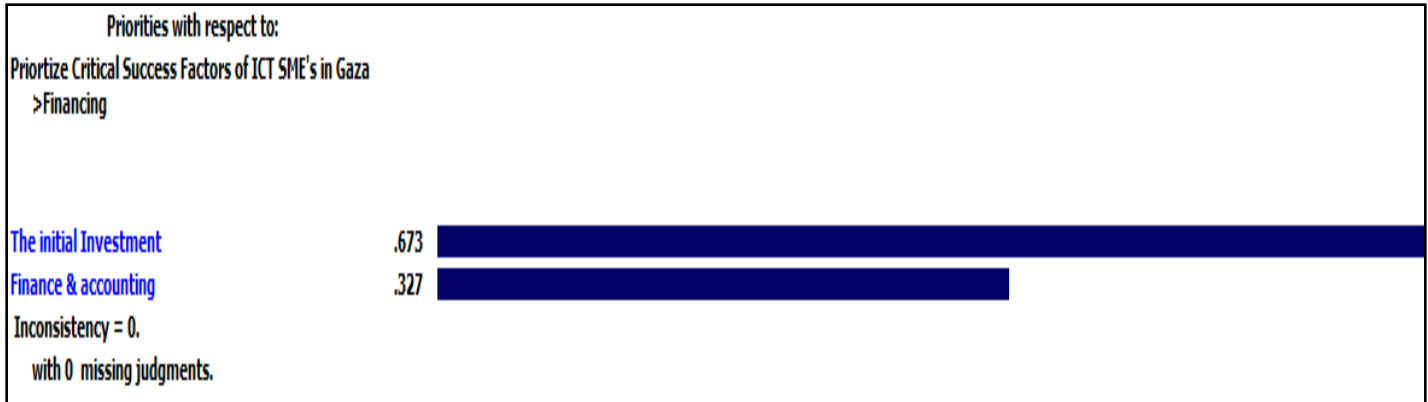
Figure 6.7 shows the normalized results of the Entrepreneurs' Characteristics sub-criteria, Creativity gets 100% and relatively, Leadership, Team working skills and Risk Taking skills get 73.9%, 70.7% and 49.1% respectively.



**Fig.(6.7): Normalized results of the Entrepreneurs' Characteristics sub-criteria**

### 3. Financials:

The experts' judgments of the Financing sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal as shown in figure 6.8.

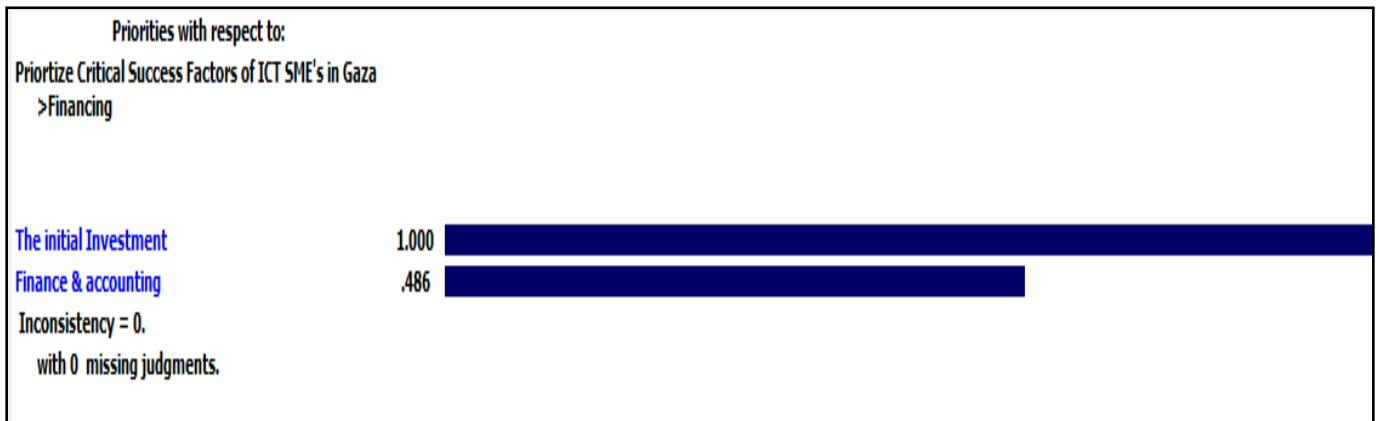


**Fig.(6.8): Financing sub-criteria Pair Wise Comparison**

Figure 6.8 shows that the initial investment for the enterprises gets 67.3% and then the financing and accounting performance gets 32.7%, which means that from the experts point of view that the initial investment is more important than the finance and accounting skills of the entrepreneurs to success in running their startups.

The Consistency Ratio (CR) or the level of inconsistency for the Financing sub-criteria pair wise comparison equals 0.00 which is less than 0.1 or (10%), and that's considered acceptable.

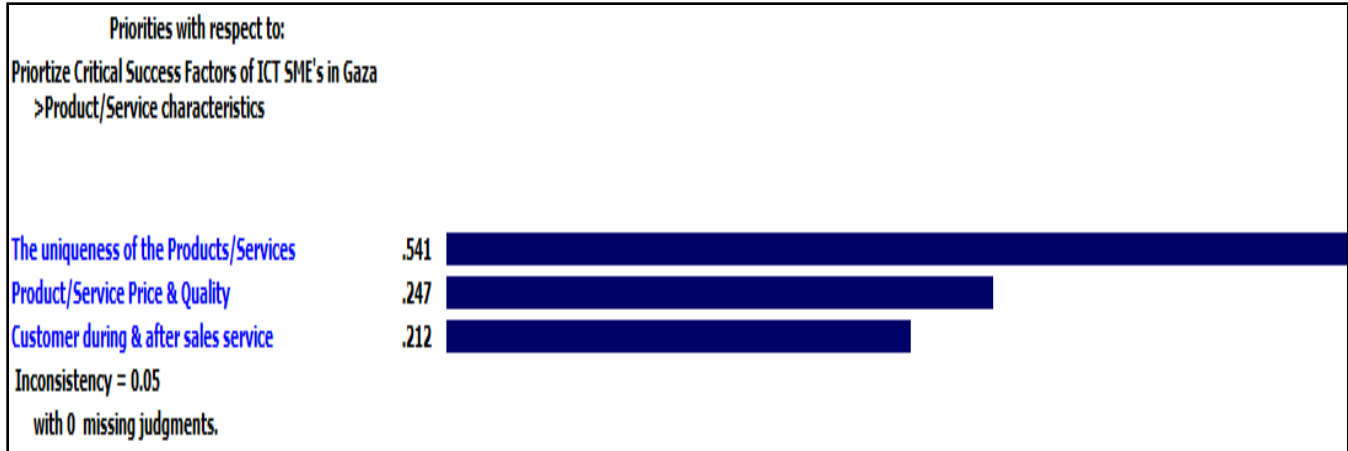
Figure 6.9 shows the normalized results of the Financing sub-criteria, The initial investment gets 100% and the Finance and accounting gets 48.6%



**Fig.(6.9): normalized results of the Financing sub-criteria**

#### 4. Product/Service Characteristics

The experts' judgments of the Product/Service Characteristics sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal as shown in figure 6.10.

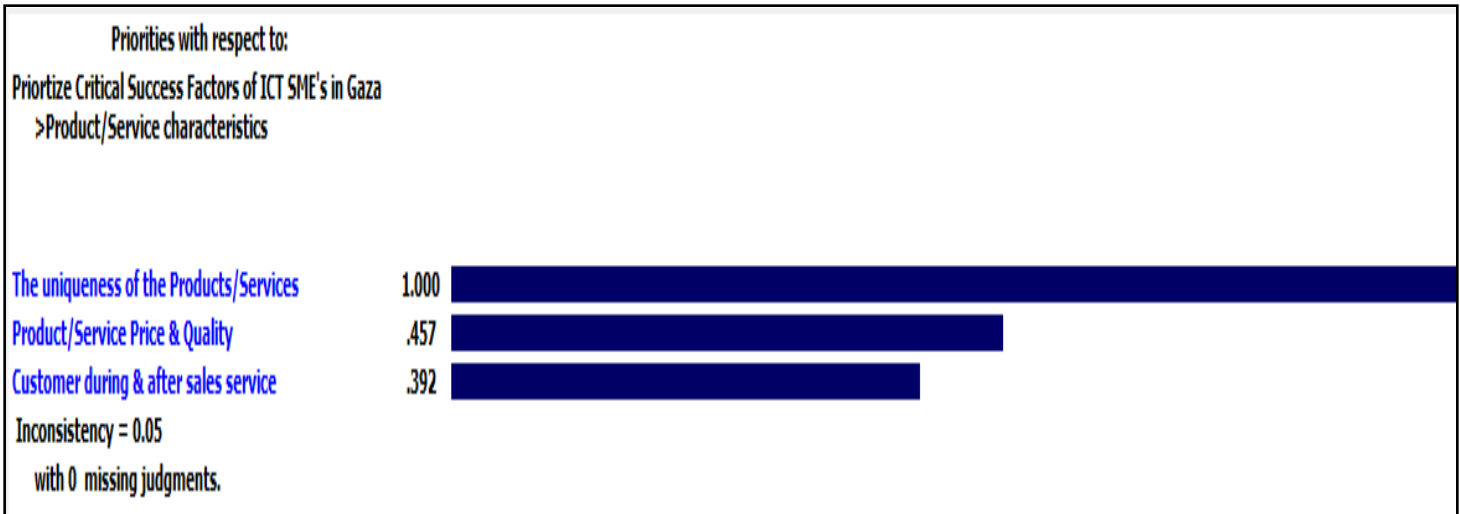


**Fig.(6.10): Product/Service Characteristics sub-criteria Pair Wise Comparison**

As shown in Figure 6.10, the experts gave the uniqueness criterion in the highest rate in relative to the goal with percentage of 54.1%, and then the Product/Service Price and Quality comes in second place with 24.7%, finally, the Customer during and after sales service criterion comes in the third place with 21.2%.

Remarkably, the Consistency Ratio (CR) or the level of inconsistency for the Product/Service Characteristics sub-criteria pair wise comparison equals 0.00 which is less than 0.1 or (10%), and that's considered acceptable.

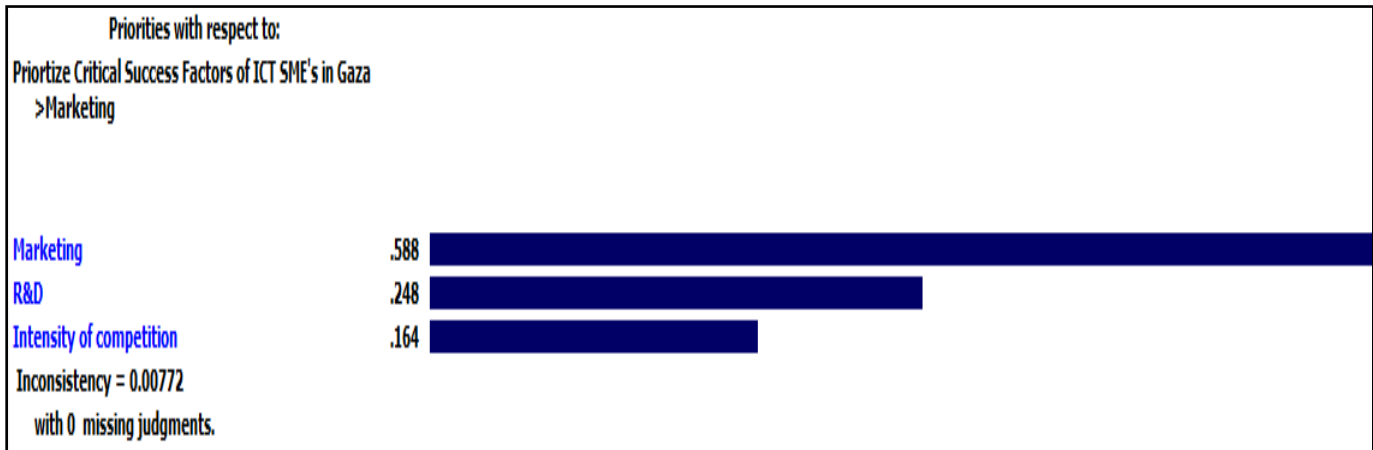
Figure 6.11 shows the normalized results of the Product/Service Characteristics sub-criteria, the uniqueness of the Products/Services gets 100% and then the Product/Service Price & Quality with percent of 45.7% and finally, 39.2% goes to the Customer during and after sales service criterion.



**Fig.(6.11): normalized results of the Product/Service Characteristic sub-criteria**

## 5. Marketing:

The experts' opinions of the Marketing sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal are shown in figure 6.12.

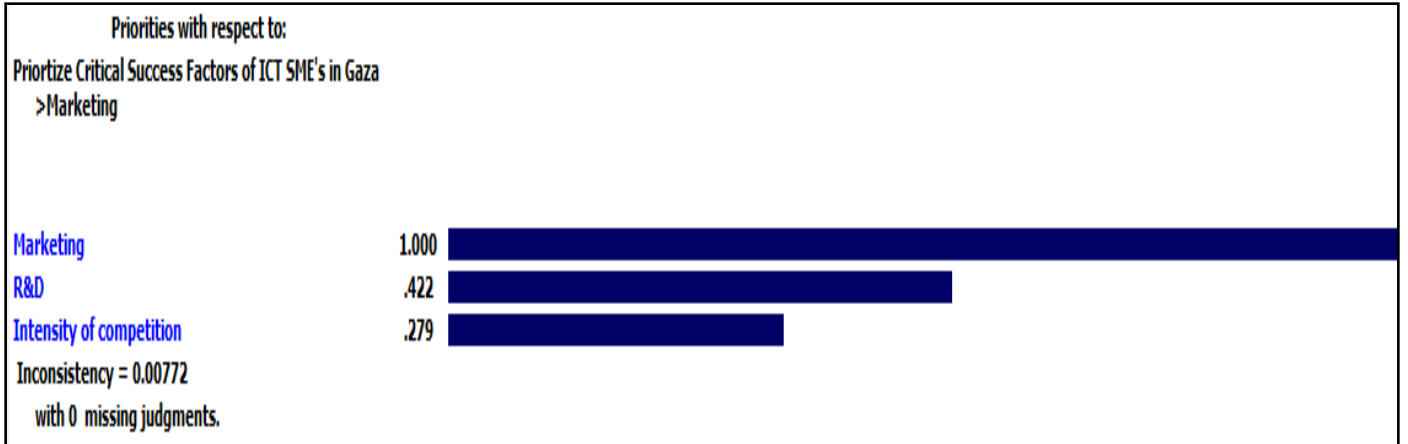


**Fig.(6.12): Marketing sub-criteria Pair Wise Comparison**

As shown in Figure 6.12, the experts said that Marketing criterion is 58.8% important in relative to the goal and it is the highest for its main criterion, and then the R&D comes in second place with 24.8%, finally, the Intensity of Competition comes in the third place with 16.4%, with level of inconsistency CR equal 0.00772 which is less than 0.1 or (10%) which is considered acceptable.



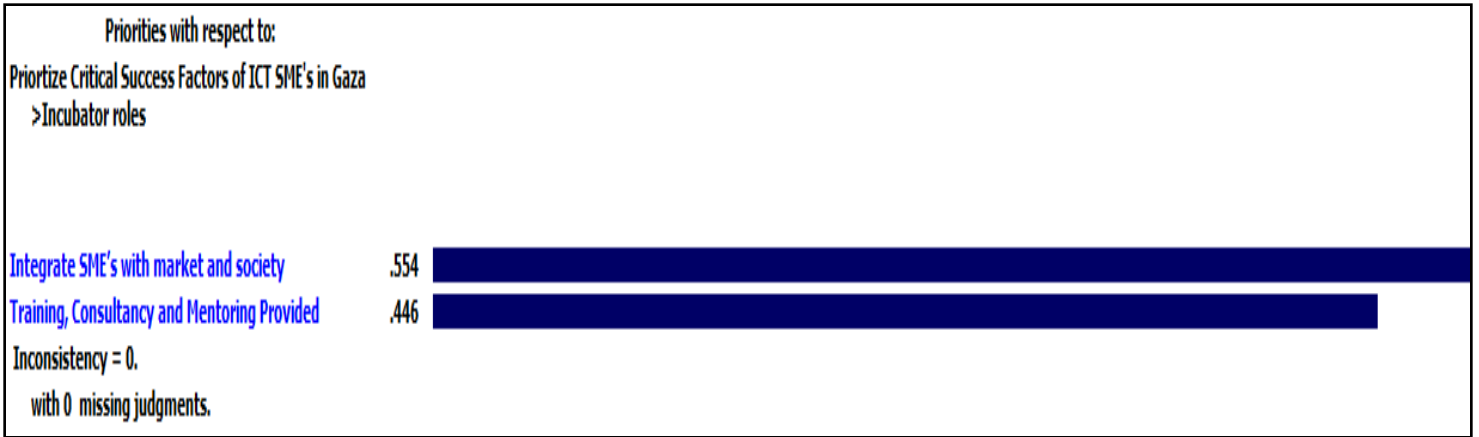
Figure 6.13 shows the normalized results of the Marketing sub-criteria, the Marketing itself gets 100% and then the R&D comes next with percent of 42.2% and finally, 27.9% goes to the Intensity of Competition criterion.



**Fig.(6.13): normalized results of the Marketing sub-criteria**

## 6. Incubators' Roles:

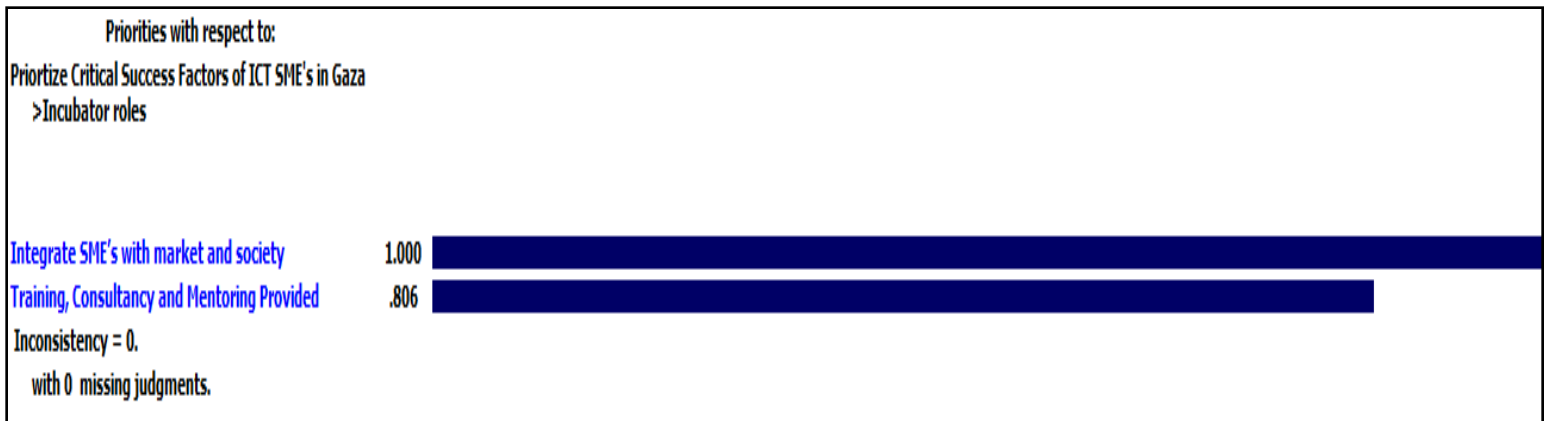
The experts' opinions of the Incubators Role sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal are shown in figure 6.14.



**Fig.(6.14): Incubators' Role sub-criteria Pair Wise Comparison**

As shown in Figure 6.14, the experts gave the Integration of SME's with market and society criterion in the highest ratein relative to the goal with percentage of 55.4%, and then, with no big difference, the Training, Consultancy and Mentoring criterion comes in second place with 44.6%, The CR equal 0.00 which is less than 0.1 or (10%) and that's considered acceptable.

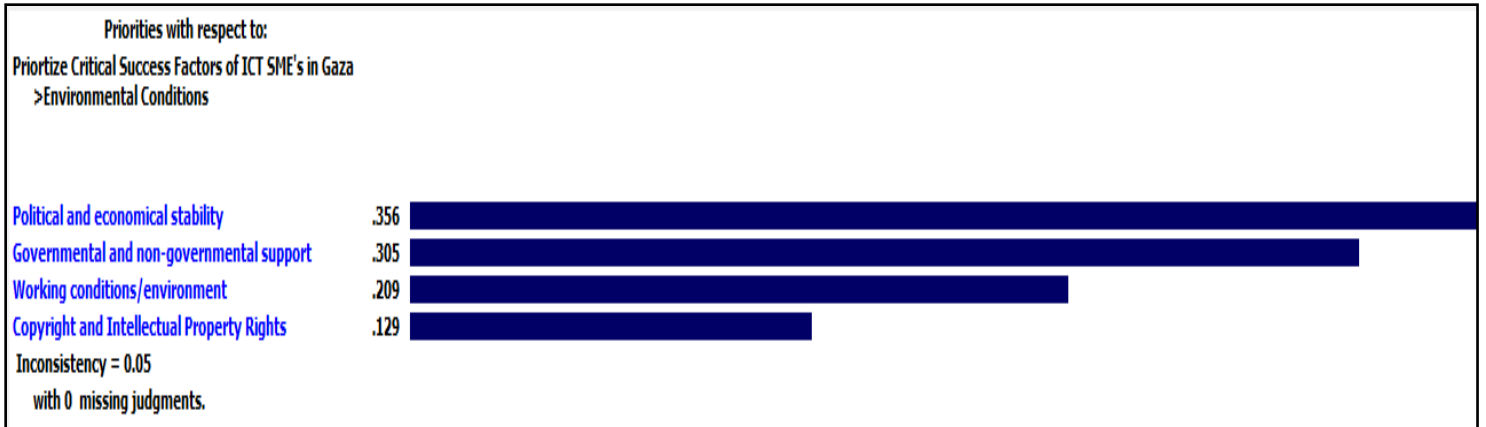
The normalized results of the Incubators' Role sub-criteria are shown in Figure 6.15, the integration criterion gets 100% and then the Training, Consultancy and Mentoring criterion comes next with percent of 80.6%.



**Fig.(6.15): normalized results of the Incubators' Role sub-criteria**

## 7. Environmental Conditions:

The experts' opinions of the Environmental Conditions sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal are shown in figure 6.16.



**Fig.(6.16): Environmental Conditions sub-criteria Pair Wise Comparison**

As shown in Figure 6.16, the experts' opinions said that Political and economical stability criterion is the most important in relative to the goal with 35.6%, then the Governmental and non-governmental support comes in the second place with 30.5%, the working conditions/environment of the enterprises takes the third place with 20.9%, at last comes the Copyright and Intellectual Property Rights which gets the lowest percent of 12.9%, The level of inconsistency CR equal 0.05 which is less than 0.1 or (10%) and that is acceptable.

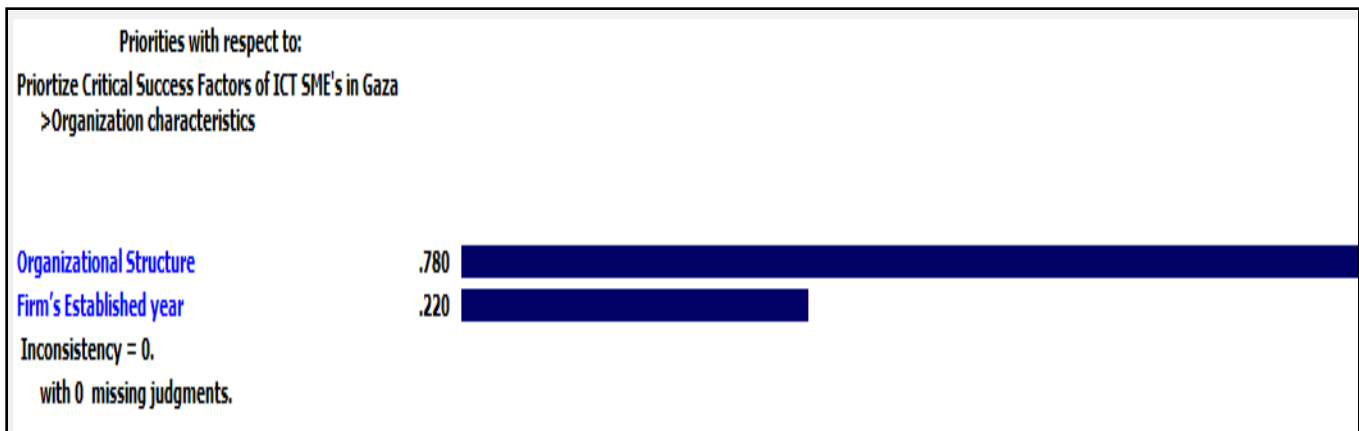
The normalized results of the Environmental Conditions sub criteria are shown in Figure 6.17, the Political and Economical Stability gets 100% and then the Governmental and non-governmental support comes next with percent of 85.65%, then the Working Conditions/environment with 58.7% and lastly the Copyright and Intellectual Property Rights which gets the lowest percent of 36.3%.



**Fig.(6.17):Normalized results of the Environmental Conditions sub-criteria**

## 8. Organization Characteristics

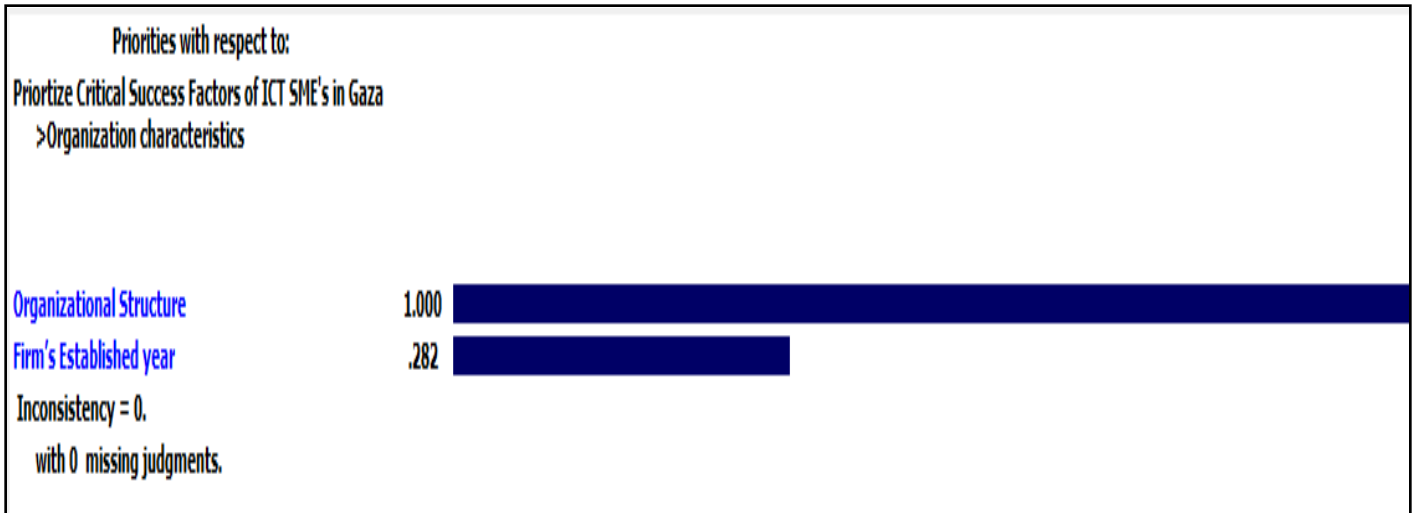
The experts' opinions of the Organization Characteristics sub criteria pair wise comparison which were entered to the EC resulted in the priorities of each sub criteria with respect to the goal are shown in figure 6.18.



**Fig.(6.18): Organization Characteristics sub-criteria Pair Wise Comparison**

As shown in Figure 6.18, the experts said that Organization Structure criterion is the more important than the Firm's Established year in relative to the goal, the first gets 78.0% while the latter gets 22% with level of inconsistency CR equal 0.00 which is acceptable.

The normalized results of the Organization Characteristics sub criteria are shown in Figure 6.19, the Organizational Structure gets 100% and then the Firm's Established Year comes next with percent of 28.2% with the same level of consistency.



**Fig.(6.19):Normalized results of the Organization Characteristics sub-criteria**

## 6.4 Analysis of Results:

After making the pair wise comparison of main criteria and sub criteria, the global weight of the sub criteria is identified by multiplying the local weight of sub criteria by the weight of its main criteria. From this global weight, a conclusion can be made about the rank of the importance of sub criteria according to the opinions of decision makers.

### 6.4.1 Main Criteria Ranking Analysis:

The results obtained by the Expert Choice software after entering the experts' judgments showed that they gave the Entrepreneurs' characteristics the first place with 20.9%, not far away, comes the Marketing main criteria with 19.1%. This emphasizes the facts which say that the personal traits of the entrepreneurs themselves play vital role in their success, being creative, innovative risk taking and good team worker come before any other factors, adding the second rank of Marketing, gives the two factors a cumulative percent of 40% of succeeding in the high-tech sector business, adding the Human Resources skills, the enterprises would gain 55% possible to succeed, with the Products/Service characteristics it is 69% and so on.

Table 6.2 shows the ranking of the main criteria with their weights and cumulative percentage as follows:

**Table (6.2): Main Criteria Weights and Cumulative percentage**

#.	Main criteria	Weight	Percent	Cumulative %
1.	Entrepreneurs' Characteristics	0.209	20.9%	20.90%
2.	Marketing	0.191	19.1%	40.00%
3.	Human Resources	0.157	15.7%	55.70%
4.	Products/Service characteristics	0.135	13.5%	69.20%
5.	Financials	0.106	10.6%	79.80%
6.	Incubators roles	0.09	9.0%	88.80%
7.	Environmental Conditions	0.065	6.5%	95.30%
8.	Organization characteristics	0.047	4.7%	100.00%
	Sum	1.00	100%	

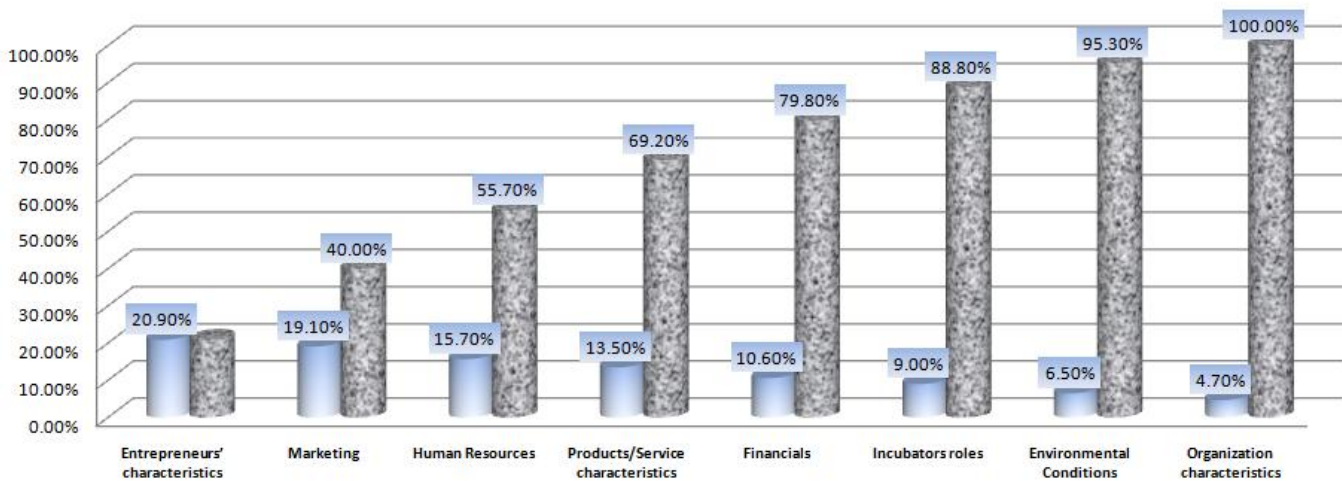
These results can lead to a conclusion that the personal traits (Creativity, Leadership, Risk taking and team working) of the entrepreneurs themselves are considered the main factor which significantly contribute to the success of the high-tech enterprises, while in the other hand, the Environmental conditions (stability and

governmental support) did not get the high attention of the experts, that was expected since we are dealing with an extremely vital sector which deals with the World Wide Web and know no limits or constraints, as mentioned in chapter 1, the internet is considered the constantly opened horizons for the youth in Gaza that suffers no siege or hardships of life, so this criterion has limited influence.

Furthermore, the classical way of management is highly not preferable, which means that the startups should follow no organized structure or hierarchy which can seize the creativity or innovation of the entrepreneurs, in addition to, in the technology sector, the firm's age or the established year is not a critical in a rapid changing field of technology.

### Main Criteria Pair Wise Comparison Results

■ Weights of the Main Criteria ■ Cumulative %



**Fig. (6.20): Bar chart shows the main criteria comparison results and cumulative percent**

## 6.4.2 Sub-Criteria Ranking Analysis:

The global weight of all sub criteria is shown in table 6.3

**Table (6.3): The global weights of sub-criteria**

Main criteria	Weight (1)	Sub criteria	Local Weight (2)	Global Weight (1)*(2)	%
Human Resources	0.157	Experience	0.628	0.098596	9.86%
		Education	0.13	0.02041	2.04%
		Managerial performance and skills	0.242	0.037994	3.80%
<b>Sum</b>			<b>1</b>	<b>0.157</b>	<b>15.70%</b>
Entrepreneurs' characteristics	0.209	Creativity	0.341	0.07127	7.13%
		Leadership	0.252	0.05267	5.27%
		Risk Taking	0.167	0.03490	3.49%
		Team Working	0.241	0.05037	5.04%
<b>Sum</b>			<b>1</b>	<b>0.209</b>	<b>20.92%</b>
Financials	0.106	The initial Investment	0.673	0.071338	7.13%
		Finance & accounting	0.327	0.034662	3.47%
<b>Sum</b>			<b>1</b>	<b>0.106</b>	<b>10.60%</b>
Products/Service characteristics	0.135	The uniqueness of the Products/Services	0.541	0.073035	7.30%
		Product/Service Price & Quality	0.247	0.033345	3.33%
		Customer during & after sales service	0.212	0.02862	2.86%
<b>Sum</b>			<b>1</b>	<b>0.135</b>	<b>13.50%</b>
Marketing	0.191	Marketing	0.588	0.112308	11.23%
		Intensity of competition	0.164	0.031324	3.13%
		R&D	0.248	0.047368	4.74%
<b>Sum</b>			<b>1</b>	<b>0.191</b>	<b>19.10%</b>
Incubators roles	0.09	Integrate SME's with market and society	0.554	0.04986	4.99%
		Training, Consultancy and Mentoring Provided	0.446	0.04014	4.01%
<b>Sum</b>			<b>1</b>	<b>0.09</b>	<b>9.00%</b>
Environmental Conditions	0.065	Political and economical stability	0.356	0.02314	2.31%
		Governmental and non-governmental support	0.306	0.01989	1.99%
		Working conditions/environment	0.209	0.013585	1.36%
		Copyright and Intellectual Property Rights	0.129	0.008385	0.84%
<b>Sum</b>			<b>1</b>	<b>0.065</b>	<b>6.50%</b>
Organization characteristics	0.047	Organizational Structure	0.78	0.03666	3.67%
		Firm's Established year	0.22	0.01034	1.03%
<b>Sum</b>			<b>1</b>	<b>0.047</b>	<b>4.70%</b>



Then, the prioritized Sub-criteria according to the global weight are shown in table 6.4:

**Table (6.4): The prioritized sub-criteria with its corresponding main criterion**

#.	Sub criteria	Corresponding main criteria	Global Weight	%
1.	Marketing	Marketing	0.112308	11.23%
2.	Experience	Human Resources	0.098596	9.86%
3.	The uniqueness of the Products/Services	Products/Service characteristics	0.073035	7.30%
4.	The initial Investment	Financials	0.071338	7.13%
5.	Creativity	Entrepreneurs' characteristics	0.071269	7.13%
6.	Leadership	Entrepreneurs' characteristics	0.052668	5.27%
7.	Team Working	Entrepreneurs' characteristics	0.050369	5.04%
8.	Integrate SME's with market and society	Incubators roles	0.04986	4.99%
9.	R&D	Marketing	0.047368	4.74%
10.	Training, Consultancy and Mentoring Provided	Incubators roles	0.04014	4.01%
11.	Managerial performance and skills	Human Resources	0.037994	3.80%
12.	Organizational Structure	Organization characteristics	0.03666	3.67%
13.	Risk Taking	Entrepreneurs' characteristics	0.034903	3.49%
14.	Finance & accounting	Financials	0.034662	3.47%
15.	Product/Service Price & Quality	Products/Service characteristics	0.033345	3.33%
16.	Intensity of competition	Marketing	0.031324	3.13%
17.	Customer during & after sales service	Products/Service characteristics	0.02862	2.86%
18.	Political and economical stability	Environmental Conditions	0.02314	2.31%
19.	Education	Human Resources	0.02041	2.04%
20.	Governmental and non-governmental support	Environmental Conditions	0.01989	1.99%
21.	Working conditions/environment	Environmental Conditions	0.013585	1.36%
22.	Firm's Established year	Organization characteristics	0.01034	1.03%
23.	Copyright and Intellectual Property Rights	Environmental Conditions	0.008385	0.84%
<b>Sum</b>			<b>1.00</b>	<b>100 %</b>

Table 6.4 contains the core findings of this research which can be briefed as follows:

- The most important sub-criteria is the “Marketing” which corresponds to the Marketing main criterion, with a global weight percentage of 11.23% and then, the “Experience” criterion which belongs to “Human Resources” criterion comes is the second rank with a percentage of 9.86%; these the two sub-criteria are very closed; this assures the vital importance of the Marketing factor which based on experience that lead to significant succeed for the ICT startups.
- The “Uniqueness of the Product/Service” and “The initial investment” sub-criteria come in third and fourth rank with a global weight percentage of 7.30% and

7.13% respectively; this assures that the uniqueness of the idea and a good start with a sufficient capital to start business largely contribute to the success.

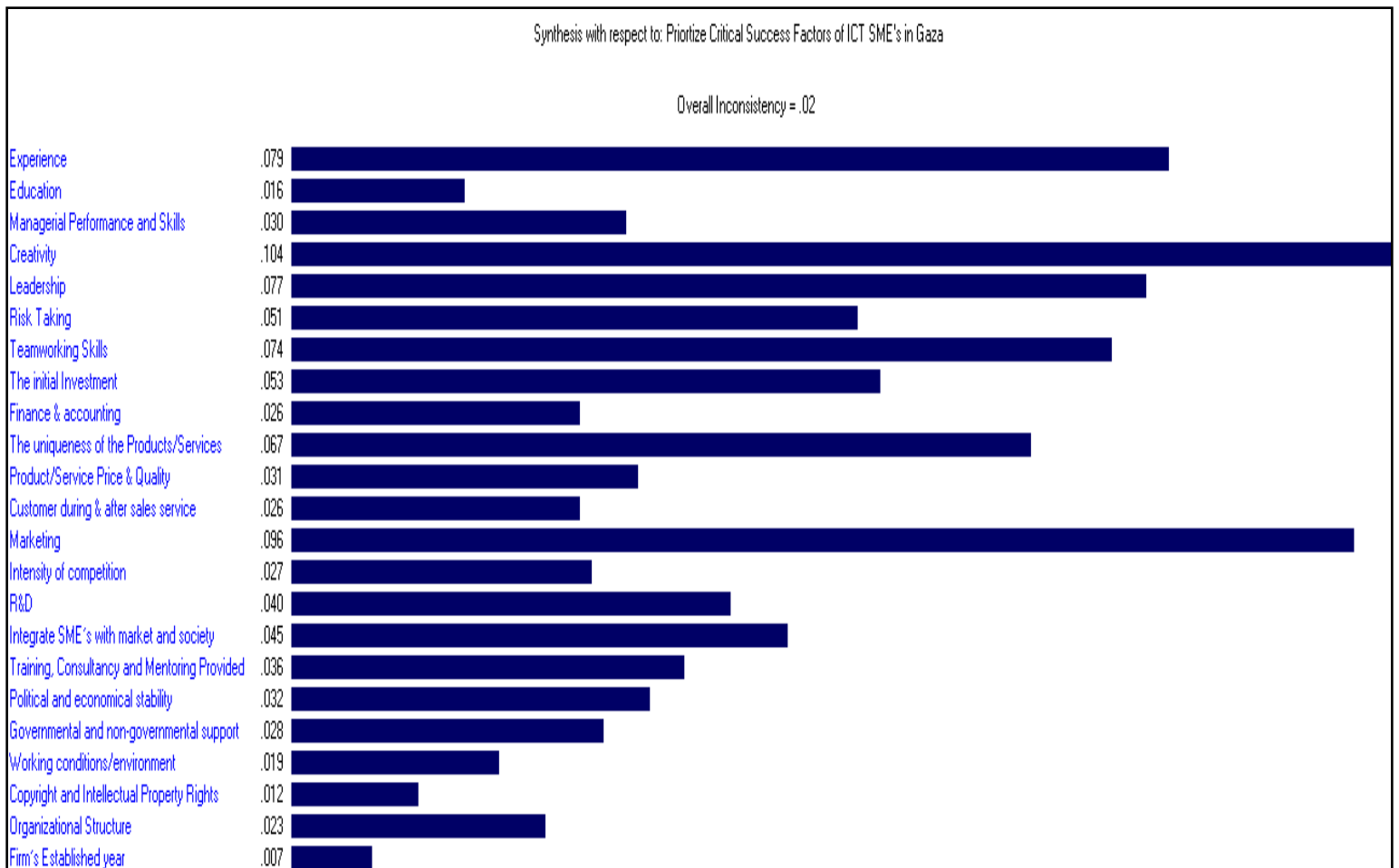
- The first place criterion in the main criteria ranking, Entrepreneurs' Characteristics, its sub-criteria come in the fifth, sixth and seventh rank which are Creativity, Leadership and Team Working with global weights of 7.13%, 5.27% and 5.04% respectively.
- For the incubators' role, the integration with society and market comes before the training, consultation and mentoring services with slight difference, the former get a global weight of 4.99% while the latter have 4.01% as the experts said.
- Still the Political and Economical stability gets a relative importance, and the get the highest global weight comparing with its counterparts sub-criteria in the Environmental Conditions, it gets 2.31% while the Governmental and non-governmental support gets 1.99% and Working Conditions has 1.03%, remarkably, the copyright and intellectual property rights gets the lowest global weight of 0.84%, it can be explained giving the state of closure and isolation that the Gaza Strip lives nowadays away from the international standards institutions, so entrepreneurs care less about the copyrights, however, it is crucial if they compete internationally one day.
- The experience of the individuals (entrepreneurs) and of the enterprise itself totally differ in affecting the success of the ICT startups, i.e. the experience criteria, in the Human Resources main criterion, was among the highest, the second most important sub-criteria, while in contrary, the firm's established year, the experience of the enterprise, sub-criterion get the second lowest global weight of 1.03%, that can be explained by that the entrepreneurs themselves need to build up experience how to deal with the obstacles and challenges face them in the beginning of their entrepreneurship life to overcome them in the most effective way, they may forced to shut down the first and second enterprise, dramatically change the field of work and/or the nature of the products and/or services to meet the demand of the customers, therefore, the experience of the enterprise does not matter while in contrary the experience of the entrepreneurs is so crucial to the success of the enterprise, taking into consideration that experience does not

include or mean by any way the education or more specifically the university degrees because they totally differ and the Education was stipulated as a separate sub-criterion for the Human Resources and it only gets 2.04% with rank 19 out of 23. It is noticed that the formalities of the management and university degrees get a low scores, i.e. Organizational Structure and Education, the former gets the 12<sup>th</sup> rank with 3.8% and the latter gets 19<sup>th</sup> rank with 2.04%, and that results comfort totally with the previous studies which conclude that the entrepreneurship needs a huge amount of creativity, innovation and out-of-the-box thinking, while some studies said that there is no relationship between succeeded enterprises and university degrees, others concluded that there is a reverse relationship between the two factors.

### 6.4.3 Inconsistency Analysis

As mentioned in chapter 4, Saaty suggests the value of Consistency Ratio CR, The ratio derived from  $CI/RI$ , should be less than 0.1, if it is greater than 0.1 (or 10%), the level of inconsistency in the set of ratings is considered to be unacceptable. In this situation, the evaluation procedure has to be repeated to improve consistency.

As shown in Figure (6.21), the inconsistency ratio for all the 23 sub-criteria is less than 0.1 or 10% except for one single sub-criteria which is the Creativity with 0.104, the researcher prefers to overlook this slight difference (0.004) or (0.4%) for two reasons, first of all that the overall inconsistency is 0.02 which acceptable, secondly, the researcher prefers not to modify the ratings of the experts so that his own subjectivity would be included.



**Fig. (6.21):The inconsistency ratios for all 23 sub-criteria**

## 6.4.4 Sensitivity Analysis

AHP sensitivity analysis is to investigate how sensitive the rankings of the main criteria and their associated sub-criteria are to change if the weights of the criteria and its related sub-criteria are subjected to change, to achieve that, the percentages of each main criteria is going to be increased by 10% and then, for the sub-criteria, it is going to be distributed evenly so that the total sum is maintained balanced, and finally figure out the changes in ranking.

It is worth mentioning that, in sensitivity analysis, one factor is changed at a time while the other factors are remained unchanged to see what the impacts or improvements would happen to this specific main criterion and its related sub-criteria.

### 6.4.4.1 Entrepreneurs' Characteristics

The Entrepreneurs' Characteristics is an already top ranked main criterion with 0.2092, so when increasing its weight by 0.1, the rank would remain unchanged, but for its sub-criteria, when adding 0.025 for each of the four, there are slight changes as shown in table 6.5.

**Table (6.5): Entrepreneurs' Characteristics Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Entrepreneurs' characteristics	0.20921	1	0.30921	1	Creativity	0.07127	0.025	0.09627	5	3
					Leadership	0.05267	0.025	0.07767	6	4
					Risk Taking	0.03490	0.025	0.0599	13	8
					Team Working	0.05037	0.025	0.07537	7	5
Sum						0.20921	0.1	0.30921		

### 6.4.4.2 Marketing

The marketing main criterion comes in the second rank with 0.191, however, the marketing sub-criterion comes in the first rank regarding the other sub-criteria, when adds 0.1 more to the main criteria weight, and 0.05 to each of the two sub-criteria, the changes in rankings are as shown in table (6.6):

**Table (6.6): Marketing Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Marketing	.191	2	.291	1	Marketing	0.112308	.033	0.14530	1	1
					Intensity of competition	0.031324	.033	0.06432	16	7
					R&D	0.047368	.033	0.08036	9	3
Sum						0.20921	0.1	0.291		

### 6.4.4.3 Human Resources

The Human Resources main criteria comes in the third rank with 0.157, while its associated sub-criteria come in different ranks, 2<sup>nd</sup>, 19<sup>th</sup> and 12<sup>th</sup>. When adding 0.1 to the main criterion and .0333 to each of the three related sub-criteria, the changes are as shown in table (6.7):

**Table (6.7): Human Resources Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Human Resources	0.157	3	0.257	1	Experience	0.098596	.033	0.13159	2	1
					Education	0.02041	.033	0.05341	19	7
					Managerial performance and skills	0.037994	.033	0.070994	12	6
Sum						0.157	0.1	0.257		

#### 6.4.4.4 Products/Service Characteristics

The Products/Service Characteristics main criterion comes in the 4<sup>th</sup>rank, while its associated sub-criteria come in the 3<sup>rd</sup>, 15<sup>th</sup>and 17<sup>th</sup> ranks. When adding 0.1 to the main criterion and .0333 to the three related sub-criterion, the changes are as shown in table (6.8):

**Table (6.8): Product/Services Characteristics Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Products/Service characteristics	0.135	4	0.235	1	The uniqueness of the Products/Services	0.07303	.033	0.10603	3	2
					Product/Service Price & Quality	0.03334	.033	0.06634	15	6
					Customer during & after sales service	0.02862	.033	0.06162	17	7
Sum						0.13499	0.1	0.235		

#### 6.4.4.5 Financials

The Financials main criterion comes in the 5<sup>th</sup>rank, while its associated sub-criteria come in the 4<sup>th</sup>and14<sup>th</sup> rank. When adding 0.1 to the main criterion and .05 to each of the two related sub-criteria, the changes are as shown in table (6.9):

**Table (6.9): Financials Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Financials	0.106	5	0.206	2	The initial Investment	0.071338	0.05	0.121338	4	1
					Finance & accounting	0.034662	0.05	0.084662	14	4
Sum						0.106	0.1	0.206		

### 6.4.4.6 Incubators' Roles

The Incubators roles main criterion comes in the 6<sup>th</sup>rank, while its associated sub-criteria come in the 8<sup>th</sup>and10<sup>th</sup>rank. When adding 0.1 to the main criterion and .05 to the each two related sub-criterion, the changes are as shown in table (6.10):

**Table (6.10): Incubators' Roles Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Incubators roles	0.09	6	0.19	3	Integrate SME's with market and society	0.04986	0.05	0.09986	8	2
					Training, Consultancy and Mentoring Provided	0.04014	0.05	0.09014	10	4
Sum						0.09	0.1	0.19		



#### 6.4.4.7 Environmental Conditions

The Environmental Conditions main criterion comes in the 7<sup>th</sup> rank, while its associated sub-criteria come in the 18<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup> and 23<sup>rd</sup> rank. When adding 0.1 to the main criterion and .025 to the each four related sub-criterion, the changes are as shown in table (6.11):

**Table (6.11): Environmental Conditions Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Environmental Conditions	0.065	7	0.165	3	Political and economical stability	0.02314	0.025	0.04814	18	9
					Governmental and non-governmental support	0.01989	0.025	0.04489	20	11
					Working conditions/environment	0.013585	0.025	0.03858	21	13
					Copyright and Intellectual Property Rights	0.008385	0.025	0.03338	23	18
Sum						0.065	0.1	0.165		

#### 6.4.4.8 Organization Characteristics

The Organization characteristics main criterion comes in the bottom rank, while its associated sub-criteria come in the 12<sup>th</sup> and 22<sup>nd</sup> rank. When adding 0.1 to the main criterion and .05 to the each two related sub-criterion, the changes are as shown in table (6.12):

**Table (6.12): Organization Characteristics Sensitivity Analysis**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate increased	New Global Weight	Old Rank	New Rank
Organization characteristics	0.047	8	0.147	4	Organizational Structure	0.03666	0.05	0.08666	12	3
					Firm's Established year	0.01034	0.05	0.06034	22	7
Sum						0.047	0.1	0.147		

#### **6.4.4.9 Sensitivity Analysis Summary**

In summary, changing 10% of the weights might be a high likely possibility due to change in circumstances or in pair wise comparisons, this slightly change significantly affect the ranks of the CSF's.

The Marketing, Human Recourses and Product/Service Characteristics are highly nominated to get the first rank if there were a change by only 10% more in the main criteria level, while the Experience and initial investment are highly likely to get rank no. one if weights were increased by .033 and .05 respectively for each sub-criterion.

In other hand, the finance and accounting jumps from 14 to 4 rank, Political and economical situation from 18 to 9 and most noticeably the organizational structure jumps from 12 to 3rd rank by only increasing .05, .025 and .05 respectively for each sub-criterion.

Table (6.13) summarizes the whole changes in weights and ranks for the main criteria and sub-criteria when increasing the weight for each main criterion by 10% while other main criteria remain unchanged, then the change in weights were distributed evenly to the related sub-criteria for each main criterion.

**Table (6.13): Sensitivity Analysis Summary**

Main Criteria	Old Weight	Old Rank	New Weight	New Rank	Sub-criteria	Old Global Weight	Rate creased	New Global Weight	Old Rank	New Rank
Entrepreneurs' characteristics	0.20921	1	0.30921	1	Creativity	0.07127	0.025	0.09627	5	3
					Leadership	0.05267	0.025	0.07767	6	4
					Risk Taking	0.03490	0.025	0.0599	13	8
					Team Working	0.05037	0.025	0.07537	7	5
Marketing	.191	2	.291	1	Marketing	0.11230	.033	0.14530	1	1
					Intensity of competition	0.03132	.033	0.06432	16	7
					R&D	0.04736	.033	0.08036	9	3
Human Resources	0.157	3	0.257	1	Experience	0.09859	.033	0.13159	2	1
					Education	0.02041	.033	0.05341	19	7
					Managerial performance and skills	0.03799	.033	0.07099	12	6
Products/Service characteristics	0.135	4	0.235	1	The uniqueness of the Products/Services	0.07303	.033	0.10603	3	2
					Product/Service Price & Quality	0.03334	.033	0.06634	15	6
					Customer during & after sales service	0.02862	.033	0.06162	17	7
Financials	0.106	5	0.206	2	The initial Investment	0.07133	0.05	0.121338	4	1
					Finance & accounting	0.03466	0.05	0.084662	14	4
Incubators roles	0.09	6	0.19	3	Integrate SME's with market and society	0.04986	0.05	0.09986	8	2
					Training, Consultancy and Mentoring Provided	0.04014	0.05	0.09014	10	4
Products/Service characteristics	0.065	7	0.165	3	Political and economical stability	0.02314	0.025	0.04814	18	9
					Governmental and non-governmental support	0.01989	0.025	0.04489	20	11
					Working conditions/environment	0.01358	0.025	0.038585	21	13
					Copyright and Intellectual Property Rights	0.00838	0.025	0.033385	23	18
Organization characteristics	0.047	8	0.147	4	Organizational Structure	0.03666	0.05	0.08666	12	3
					Firm's Established year	0.01034	0.05	0.06034	22	7

## **Chapter 7**

### **Conclusions and Recommendations**

#### **7.1 Introduction**

#### **7.2 Conclusions**

#### **7.3 Recommendations**

## 7.1 Introduction

This chapter introduces the conclusions and main findings of this study, then it will number the main important recommendations that the researcher deems necessary for the progress and development of the ICT sector enterprises in Gaza.

## 7.2 Conclusions

This study achieved its objectives by identifying the main CSF's for the ICT sector in Gaza, and reach out a rank for each main criteria and sub-criteria with the help of the AHP tool and Expert Choice Software, it came to the following conclusions:

- There is an absolute necessity to identify and prioritize the Critical Success Factors for the ICT enterprises in Gaza.
- ICT sector is very vital and important sector especially in Gaza where the imposed siege ban the free movement of goods and individuals hence the important of new creative ways to create jobs for thousands of graduates of the local universities.
- Success Factors prioritization in this study is constructed as a multi criteria problem in order to rank them by AHP and to set strategies of the most important factor then the less then the least.
- There are many criteria and variables that affect ICT enterprises success factors' prioritization and these should be considered in the evaluation process of plans aimed to develop this vital and important sector.
- Decision and policy makers should take into their consideration all of CSF, criteria and sub-criteria which could help to take better decisions for the ICT sector development.
- AHP model is capable of handling multiple criteria and enabled us to incorporate 8 main criteria and associated 23 sub-criteria both qualitative and quantitative factors, when prioritizing the CSF for ICT enterprises in Gaza.
- A powerful tool based on systematic scientific approach is presented in this research for the decision makers; the use of this tool guarantees an effective way

to rank the most important factors that should be under serenity for the development of ICT sector in Gaza.

- A group of experts and managers working in the field were selected to be the jury, and they were chosen carefully to cover all concerned fields of the ICT sector i.e. consultants, advisors, trainers, marketers and incubators and private IT company managers, in addition to their variety in the background i.e. International and non-Governmental organizations, academic organizations and private sector organizations, this would guarantee a diverse opinions which should be all taken into consideration.
- Pair-wise comparison used in this work reduces the dependency of the model on the human judgment in other words; the subjectivity of the jury, in addition to, it gives more accurate results when comparing factors that affect the goal with relative to each other rather than independently. The consistency test of the AHP model guarantees an accurate evaluation process; if there is a problem in the consistency the decision makers can know where the problem is and revise their judgments.
- The main criteria where Human Resources, Entrepreneurs' characteristics, Financials, Products/Service characteristics, Marketing, Incubators roles, Environmental Conditions and finally Organization characteristics with 23 associated sub-criteria.
- Entrepreneurs' characteristics and Marketing main criteria get the highest rank with 20.9% and 19.1% respectively, while in the other hand the Environmental conditions and Organizational Structure get the lowest percentages of 6.5% and 4.7% respectively.
- For the 23 sub criteria, Marketing and experience were the top two sub-criteria with 11.23% and 9.86% respectively, noticeably, the Entrepreneurs' characteristics sub-criteria took the successive fifth, sixth and seventh rank with 7.13%, 7.13% and 5.27% in a row, while the Firm's Established year and Copyright and Intellectual Property Rights came at the end with 1.03% and 0.84% respectively.
- The sub criteria results can be summarized in the following table 7.1:

**Table (7.1): Sub Criteria Ranking Results**

#.	Sub criteria	Corresponding main criteria	Global Weight	%
24.	Marketing	Marketing	0.112308	11.23%
25.	Experience	Human Resources	0.098596	9.86%
26.	The uniqueness of the Products/Services	Products/Service characteristics	0.073035	7.30%
27.	The initial Investment	Financials	0.071338	7.13%
28.	Creativity	Entrepreneurs' characteristics	0.071269	7.13%
29.	Leadership	Entrepreneurs' characteristics	0.052668	5.27%
30.	Team Working	Entrepreneurs' characteristics	0.050369	5.04%
31.	Integrate SME's with market and society	Incubators roles	0.04986	4.99%
32.	R&D	Marketing	0.047368	4.74%
33.	Training, Consultancy and Mentoring Provided	Incubators roles	0.04014	4.01%
34.	Managerial performance and skills	Human Resources	0.037994	3.80%
35.	Organizational Structure	Organization characteristics	0.03666	3.67%
36.	Risk Taking	Entrepreneurs' characteristics	0.034903	3.49%
37.	Finance & accounting	Financials	0.034662	3.47%
38.	Product/Service Price & Quality	Products/Service characteristics	0.033345	3.33%
39.	Intensity of competition	Marketing	0.031324	3.13%
40.	Customer during & after sales service	Products/Service characteristics	0.02862	2.86%
41.	Political and economical stability	Environmental Conditions	0.02314	2.31%
42.	Education	Human Resources	0.02041	2.04%
43.	Governmental and non-governmental support	Environmental Conditions	0.01989	1.99%
44.	Working conditions/environment	Environmental Conditions	0.013585	1.36%
45.	Firm's Established year	Organization characteristics	0.01034	1.03%
46.	Copyright and Intellectual Property Rights	Environmental Conditions	0.008385	0.84%
<b>Sum</b>			<b>1.00</b>	<b>100 %</b>

The results of the main criteria are briefed as follows in table (7.2):

**Table (7.2): Main Criteria Ranking Results**

#.	Main criteria	Weight	Percent	Cumulative %
1.	Entrepreneurs' Characteristics	0.209	20.9%	20.90%
2.	Marketing	0.191	19.1%	40.00%
3.	Human Resources	0.157	15.7%	55.70%
4.	Products/Service characteristics	0.135	13.5%	69.20%
5.	Financials	0.106	10.6%	79.80%
6.	Incubators roles	0.09	9.0%	88.80%
7.	Environmental Conditions	0.065	6.5%	95.30%
8.	Organization characteristics	0.047	4.7%	100.00%
Sum		1.00	100%	

### 7.3 Recommendations

Based on the results of this research, recommendations can be classified as practical and theoretical recommendations, the practical recommendations are as follows:

- Decision makers in Gaza especially who works in the ICT sector are recommended to use the results of this research in any future development plan for the ICT sector.
- The research model can be used in the evaluation and ranking of the most important success factors to improve the ICT sector in Gaza.
- As the “The Entrepreneurs’ Characteristics” main criteria with 4 sub-criteria which are: Creativity, Leadership, Team working and Risk taking get the highest rank, it is recommended to enhance these skills among the schools and universities’ students by promoting the creative and innovative ways for educations, encourage the practical case studies, enhancing the research methods and techniques, set the ground for the pupils to think out of the box.
- Up to the Marketing, it is highly recommended to double the marketing efforts of the ICT enterprises by setting separate Marketing plans for the enterprises which could take into some details the Marketing mix of Products, Place, Promotion and Price, taking advantage of the new marketing theories worldwide.
- New ways and technologies of marketing are recommended to be used in the marketing process like social media platforms and the smart phones applications to assess, evaluate and market the products and/or services of the enterprises.
- A domestic educational plan should be considered to figure out the points of strengths of the educational system, then to enhance it, and the weaknesses to solve or avoid it as much as possible, putting into highly consideration the enhancement of the soft skills needed for the entrepreneurship.
- For the Human Resources main criteria, it is recommended for creating ways to enhance the personal experience of the entrepreneurs’ themselves and build their managerial capacities regardless of the university or formal degrees they get.
- Regarding the financial supports, the research recommends to increase the amounts granted for the enterprises in the early stages, so that they get enough



fund for the business and setup cost necessary for the establishment of their enterprises.

- For the Products/Services Characteristics, it is recommended for the new entrepreneurs to innovate or originate new ideas and/or products which are unique, which can contribute to the success of the enterprise two times double than focusing in the price, quality or customer after and after sales services.
- For the incubators, it is recommended to focus more in the integration process of the enterprises with local and global markets and local society by hiring special advisors and consultants with strong background in orientation and integration of the startups with local and global communities, but not to overlook the training, business consultancy and mentoring issues since it is not slightly less important than the previous sub-criteria with slight percent.
- Relatively speaking, still the political and economical situation the major motto of any outside investments; in the other hand the research results reveal that the governmental and non-governmental support for the ICT sector is not critical for the success of the ICT enterprises nor the working conditions/ environment.
- To raise the awareness of Copy right and intellectual property rights, since it get the lowest global weight (0.84%) despite the importance of this issue worldwide, the ignorance of this issue can be explained due to two main reasons; the political division between the West Bank and Gaza from one side, and the disconnecting of Gaza from the outside world from the other side.
- The research recommends focusing more in the individual experience rather than the enterprise experience.
- For future work, theoretical recommendations, It is recommended to use other MCDM techniques like (TODIM), Preference Ranking Organization Method for Enrichment Evaluations (PRMOTHEE) and Elimination and Choice Expressing the Reality (ELECTRE) in prioritizing and ranking the CSF for ICT sector and compare their results to this research results.
- For future researchers, it is recommended to take the incubators which work in Gaza as alternatives and prioritize them based on these criteria and sub-criteria, in

addition to including other quantitative tools in the research like Data Envelopment Analysis (DEA) and other linear programming techniques.

## References

### Books

1. Lootsma F. A., (1999), “Multi-Criteria Decision Analysis via Ratio and Difference Judgement”, Kluwer Academic Publishers, Netherlands. Available online at:  
[http://books.google.ps/books?id=Km\\_m99RselkC&printsec=frontcover#v=onepage&q&f=false](http://books.google.ps/books?id=Km_m99RselkC&printsec=frontcover#v=onepage&q&f=false)
2. Michael Doumpos, Evangelos Grigoroudis, (2013), “Multicriteria Decision Aid and Artificial Intelligence; Links, Theory and Application, John Wiley & Sons, Ltd. United Kingdom. Available online at:  
<http://books.google.ps/books?id=h0fzu1SNGb4C&printsec=frontcover#v=onepage&q&f=false>
3. Ronald J. Ebert and Ricky W. Griffin, (2006), BUSINESS, Eighth Edition, Pearson Prentice Hall.

### Theses

1. Ahmed S. Al Afeefy, (2011), “Compensating Fund Allocation for Industrial Sectors in Gaza Strip Using AHP and Goal Programming”, A Thesis Submitted In Partial Fulfillment Of The Requirements For The Degree Of MBA.
2. Dr. Ling Xu & Dr. Jian-Bo Yang, (2001),”Introduction to Multi-Criteria Decision Making and the Evidential Reasoning Approach”, Working Paper No. 0106, Manchester School of Management, University of Manchester Institute of Science and Technology, Manchester, UK.
3. Jorge Costa-David, Jack Malan, Partner and Rustam Lalkaka, (2002), Improving Business Incubator Performance through Benchmarking and Evaluation: Lessons Learned from Europe. 16th International Conference on Business Incubation National, Business Incubation Association, April 28 – May 1, 2002, Canada.
4. Khalid Abed Dahleez, (2009), “The Role of Business Incubators in Developing Entrepreneurship and Creating New Business Start-ups in Gaza Strip”, A Thesis

- Submitted in Partial Fulfillment of Requirements for the Degree of Master in Business Administration
5. Mohammed Z. Skaik, (2013), “The Role of Business Incubators in Achieving the Sustainable Development in the Gaza Strip Case Study: The Business and Technology Incubator at IUG”, A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master in Business Administration.
  6. Monia Lougui, (2010), “Identifying Obstacles Encountered by Swedish Entrepreneurs? Evidences from the Start-line”, Master of Science Thesis, KTH Economics of Innovation and Growth. Stockholm, Sweden
  7. Rana EL-shaqra and Huda Barakat, (2013), “The obstacles which are facing Entrepreneurs to create small Business in Gaza”, A Thesis Submitted in Partial Fulfillment of the Requirements for the Bachelor Degree of Business Administration
  8. Shirin Adnan Slatunh, (2005), “Financial and administrative problems faced by small businesses in the Southern Region in Gaza strip”, A Thesis Submitted in Partial Fulfillment of Requirements for the Degree of Master in Business Administration.

### **Published Papers**

1. Ali Salman Saleh and Nelson Oly Ndubisi, (2006) “An Evaluation of SME Development in Malaysia”, International Review of Business Research Papers Vol.2. No.1 August 2006 pp.1-14.
2. Arash Sadeghia, Adel Azarb and Ramin Sepehri Radc, (2012), “Developing a fuzzy group AHP model for prioritizing the factors affecting success of High-Tech SME's in Iran: A case study”, Procedia - Social and Behavioral Sciences Vol. 62, p. 957 – 961
3. Aristidis Bitzenis, Ersanja Nito, (2005), “Obstacles to entrepreneurship in a transition business environment The Case of Albania”, Journal of Small Business and Enterprise Development, Emerald Group Publishing Limited, Vol. 12 No. 4, 2005, pp. 564-578

4. E. Dooley, d. C. Smeaton, g.w. Sheath and S. F. Ledgard, (2009), "Application of Multiple Criteria Decision Analysis in the New Zealand Agricultural Industry", Wiley InterScience, Journal Of Multi-Criteria Decision Analysis, Anal. 16: 39–53.
5. Hassan Gholipour Fereidouni, Tajul Ariffin Masron, Davoud Nikbin, Reza Ekhtiari Amiri, (2010), "Consequences of External Environment on Entrepreneurial Motivation in Iran", Asian Academy of Management Journal Vol. 15, No. 2, p. 175–196,
6. Hua-Yang Lin, Ping-Yu Hsu and Yung-Tai Yeh , (2006), "Application of the AHP in data warehouse system selection decisions for SMEs in Taiwan", Inderscience Enterprises Ltd. Int. J. Management and Enterprise Development, Vol. 3, No. 6, 2006 599.
7. K. Lavanya Latha & B.E.V.V.N. Murthy, (2009), "Problems of small-scale entrepreneurs in Nellore District", Journal of Chinese Entrepreneurshi, Academic Paper, Emerald Group Publishing Limited, Vol. 1 No. 3, 2009, pp. 268-278.
8. Kathryn Watson, Sandra Hogarth-Scott and Nicholas Wilson, (1998), "Small business start-ups: success factors and support implications", International Journal of Entrepreneurial Behaviour & Research, Vol. 4 No. 3, pp. 217-238. UK.
9. Kim Cheng Patrick Low, (2006) "Cultural obstacles in growing entrepreneurship: a study in Singapore", Journal of Management Development, Vol. 25 Iss: 2, pp.169 – 182
10. Michael Bowen, Makarius Morara, Samuel Mureithi, (2009), "Management of Business Challenges Among Small and Micro Enterprises in Nairobi-Kenya", kca Journal of Business management: vol. 2, issue 1.
11. Milan Janic and Aura Reggiani, (2002), "An Application of the Multiple Criteria Decision Making (MCDM) Analysis to the Selection of a New Hub Airport" EJTIR, 2, no. 2 (2002), pp. 113 - xx
12. Mostafa Hosseinzadeh, Seyed Mahdi Vesal, Reza Shamsaddini, Azadeh Kamel, (2013) "Prioritizing Competitive Strategies in Iranian SME's Based on AHP Approach in Severe Economic Sanctions", International Journal of Business and Management; Vol. 8, No. 16; 2013

13. R. W. SAATY, (1987), "THE ANALYTIC HIERARCHY PROCESS-WHAT IT IS AND HOW IT IS USED", Pergamon Journals Ltd, Vol. 9, No. 3-5, pp. 161-176, Great Britain
14. Ravikumar M.M, Marimuthu.K , Parthiban.P, Abdul Zubar.H, (2013), "Leanness Evaluation in 6 Manufacturing MSME's using AHP & SEM Techniques", International Journal of Mechanical & Mechatronics Engineering IJMME-IJENS Vol:13 No:06
15. Sandra L. Fielden, Marilyn J. Davidson and Peter J. Makin, (2000), "Barriers encountered during micro and small business start-up in North-West England", Journal of Small Business and Enterprise Development, Volume 7, Number 4.
16. Scott Shane, Edwin A. Locke and Christopher J. Collins, (2003), "Entrepreneurial motivation", Science Direct, Human Resource Management Review13, pp. 257-279
17. Seyed Kaveh Jamali, Behrang Samadi and DR. G. Marthandan, (2014), "Prioritizing Electronic Commerce Technologies in Iranian Family SME's, Interdisciplinary Journal of Contemporary Research in Business, June 2014, vol 6, no 2.
18. Syed Zamberi Ahmad, Siri Roland Xavier, (2012) "Entrepreneurial environments and growth: evidence from Malaysia GEM data", Journal of Chinese Entrepreneurship, Vol. 4 Iss: 1, pp.50 – 69
19. Yueh-Hua Lee, (2014), A Decision Framework for Cloud Service Selection for SMEs: AHP Analysis", Scientific Online, Department of Business Administration, Tamkang University, New Taipei City, Taiwan, Volume 1, Number 1,

### **Articles, Reports and Documents**

1. Ahmad Ghandour, (2014), "A Fuzzy AHP Approach for Assessing Value Proposition in eCommerce Websites in SMEs in Abu Dhabi" International conference on Computer Science and Information Systems (ICSIS'2014), Oct 17-18, 2014 Dubai (UAE).

2. Ahmad Z. S. & Xavier S. R., (2012) “Entrepreneurial environments and growth: evidence from Malaysia GEM data”
3. Al- Mahrouk Maher and Makabla Ehab, (2006), “Small and Medium Enterprises, the Importance and the Impediments in Jordan”, Small and Medium enterprises Center, Amman, Jordan.
4. Aries Susanty, Diana Puspitasari, Sri Hartini, Ganung Sugi, (2014), “Prioritization of Supplier Selection Criteria in Batik Industry: A Fuzzy-AHP Approach”, Paper Proposals To Be Submitted to the International Symposium of the 2014, Washington D.C., U.S.A.  
Available online at:
5. Bruno Gonçalo Nunes and João Paulo Costa, (2012), “Supporting the Diagnostic of Portuguese SME using AHP” EWG-DSS LIVERPOOL 2012
6. Entrepreneurship: Beyond the Lemonade Stand, (2008) A career reflection guide to owning your own business, Saint Louis University.  
[http://www.ifc.org/wps/wcm/connect/0fe6e2804e2c0a8f8d3bad7a9dd66321/IFC\\_FULL+JOB+STUDY+REPORT\\_JAN2013\\_FINAL.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/0fe6e2804e2c0a8f8d3bad7a9dd66321/IFC_FULL+JOB+STUDY+REPORT_JAN2013_FINAL.pdf?MOD=AJPERES)
7. International Finance Corporation (IFC) Jobs Study, (2013), “Assessing Private Sector Contributions to Job Creation and Poverty Reduction”.
8. L. Alberto Franco and Gilberto Montibeller, (2009), Problem Structuring for Multi-Criteria Decision Analysis Interventions, Working Paper OR 09 – 115, UK.
9. Madani Alomar, (2013), “Improving Performance of SME’s Using SCOR and AHP Methodology”, Proceedings of the 2013 Winter Simulation Conference, Windsor, CANADA
10. Mahesha Kapurubandara and Robyn Lawson, (2006), “Barriers to Adopting ICT and e-commerce with SMEs in Developing Countries: An Exploratory study in Sri Lanka”, School of Computing and Mathematics, University of Western Sydney, Australia
11. Palestinian Central Bureau of Statistics, 2013. Performance of the Palestinian Economy, Ramallah – Palestine.

12. Patchara Boonyaprasit, Sen Yang, (2010), “How SMEs make their decision for choosing an optimal ERP provider by using AHP method”, Master thesis in Informatics, Department of Informatics, Lund University.
13. Rima M. Bizri, Alia Kojok, Abdallah Dani, Mohammad Mokahal, Mohammad Bakri, (2012) “Barriers to Entrepreneurial Endeavors in a Developing Economy”, Hariri Canadian University, Lebanon.
14. Samya ben Ramadan, (2006), “SMEs Challenges in developing countries from the economic and social perspective- Algeria as a case study”, Social and Humanitarian studies Institute, Algeria.
15. Schaul Chorev and Alistair R. Anderson, (2006), “Success in Israeli High-Tech Start-Ups; Critical Factors and Process”, *Technovation*, 26(2), 162-174.
- Shane, S., Locke, E. A., & Collins, C. J. (2012). Entrepreneurial motivation, Electronic version, Cornell University, ILR School site: <http://digitalcommons.ilr.cornell.edu/articles/x>, Accessed on 9th February 2015, 11:00 AM
16. Teruyui Bunno, Hiroki Idota, Masaru Ogawa, Masatsugu Tsuji, Hiroaki Miyoshi and Machiko Nakanishi, (2007), “Index of the Diffusion of Information Technology among SME’s: an AHP Approach”
17. Thair Adnan Kaddumi, (2010), “Small Enterprises Finance in Jordan – Obstacles and Challenges”, Working Paper, Economy and Management Studies Faculty, Amman, Jordan.
18. U.S. Department of State, “Principles of Entrepreneurship”, Bureau of International Information Programs.

## Websites

1. Palestinian Central Bureau of Statistics (PCBS), Press Release on the Results of the Labour Force Survey, Second Quarter (April– June, 2014) Round, Main Results Website:  
<http://www.pcbs.gov.ps/site/512/default.aspx?tabID=512&lang=en&ItemID=1182&mid=3172&wversion=Staging>



Accessed on Sunday 16<sup>th</sup> Nov, 2014 1:48 PM

2. Website: [http://en.wikipedia.org/wiki/Thomas\\_L.\\_Saaty](http://en.wikipedia.org/wiki/Thomas_L._Saaty)

Accessed on: Friday 14/11/2014, 8:50 AM

3. National Business Incubation Association, 2012. What Is Business Incubation.

Through Website: [http://www.nbia.org/resource\\_library/what\\_is/](http://www.nbia.org/resource_library/what_is/)

[http://www.nbia.org/resource\\_library/what\\_is/](http://www.nbia.org/resource_library/what_is/)

Accessed on Tuesday 18/11/2014. 11:11 AM

4. European Commission. Enterprise Directorate-General. Benchmarking of Business Incubation. Available online at:

<http://www.cses.co.uk/upl/File/Benchmarking-Business-Incubators-main-report-Part-1.pdf>

Accessed on Tuesday 18/11/2014. 2:28 PM

5. <http://www.mobaderoon.ps/ar/index.php>

6. <http://www.creatives.ps/ar/index.php>.

7. [http://en.wikipedia.org/wiki/Small\\_business](http://en.wikipedia.org/wiki/Small_business)

Accessed on Friday 21<sup>st</sup> Nov., 2014 7:02 PM

8. Website of the Business and Technology Incubator, Accessed on Monday 24/11/2014 at 11:50 AM

<http://www.bti.ps/en/index.php?action=view&cat=main&id=1>

## Appendices

### Appendix A: ICT Startups Critical Success Factors Questionnaire

The Islamic University- Gaza  
Deanship of Graduate Studies  
Faculty of Commerce  
Business Administration Department



الجامعة الإسلامية- غزة  
عمادة الدراسات العليا  
كلية التجارة  
قسم إدارة الأعمال

### ICT Startups Critical Success Factors Questionnaire

Dear Sir/Madam;

The aim of this questionnaire is to identify the Critical Success Factors (CSF's) for the Incubated Small and Medium Information and Communications Technology Enterprises in Gaza which mainly contribute in the success of these startups.

This questionnaire is the first step in constructing a model for prioritizing these CSF's for the high-tech startups in the Gaza Strip using the (AHP), a well-known and widely-used quantitative tool used by researchers.

In order to achieve this aim, It is highly appreciated if you kindly filled the questionnaire by giving your own opinions of the importance of each criterion, knowing that you can add other important criteria and sub criteria in your opinion. The accuracy of the results depends on these valuable data.

This research will help decision makers at academic institutions to implement major changes in academic plans to reflect entrepreneurial skills among their graduates as well as other complementary skills required for establishing new ICT startups, it will also help decision and policy makers in formal and informal institutions to adopt the best model of business incubation suitable for the Gaza Strip ICT startups based on other successful models and frameworks implemented in other countries and give them a full image about Palestinian entrepreneurs,

All of data collected will be guaranteed confidentially and used **ONLY** for scientific purpose which the researcher needs for his MBA degree thesis.

Thanks in advance for your contribution in enhancement of scientific research process in the Gaza Strip.

Supervisor

Researcher

Prof. Dr. Yousif H. Ashour

Nader R. Abdelnaby

## Part I

### General Information

Name: .....

Organization: .....

Job Title: .....

Put the sign (X) in the suitable selection:

- **Place of work**

- Public sector
- Donors
- Private sector
- Non Governmental Organizations NGO's
- International Non Governmental Organizations INGO's
- Other, Specify .....

- **Experience**

- 1 – 3 years
- 3-7 years
- More than 7 years

- **Education**

- Bachelor B.Sc.
- Master M.Sc.
- Doctorate (Ph.D.)

## Part II

### Criteria and sub criteria importance table

Main criteria	Sub criteria	Very important	Important	Moderately important	Little important	Not important
Human Resources	9. Experience					
	10. Education					
	11. Managerial performance and skills					
Entrepreneurs' characteristics	12. Personal traits (Creativity, Leadership)					
	13. Risk Taking					
	14. Family support					
Financial	15. The initial Investment					
	16. Finance & accounting					
Product characteristics	17. Product/Service Price & Quality					
	18. Customer during & after sales service					
Marketing	19. Marketing					
	20. Intensity of competition					
	21. R&D					
Incubator roles	22. Integrate SME's with market and society					
	23. Training and Consultancy Provided					
Policy and Policies	24. Political and economical stability					
	25. the governmental support of domestic products					
	26. Copyright and Intellectual Property Rights					
Organizational	27. Organizational Structure					
	28. Firm's Established year					

**Part III**

**Other important criteria or sub criteria suggested by the expert**

<b>Main criteria</b>	<b>Sub criteria</b>

*Kindly accept our greetings, Thank you*

*Date: .....*

*Signature: .....*

## Appendix B: ICT Startups Critical Success Factors Pair-wise Comparison Questionnaire

The Islamic University- Gaza  
Deanship of Graduate Studies  
Faculty of Commerce  
Business Administration Department



الجامعة الإسلامية- غزة  
عمادة الدراسات العليا  
كلية التجارة  
قسم إدارة الأعمال

### ICT Startups Critical Success Factors Pair-wise Comparison Questionnaire

Dear Sir/Madam;

The aim of this questionnaire is to make the pair wise comparisons of the main criteria and sub-criteria for each main criterion which were identified in questionnaire 1 and their importance in the process of prioritizing Critical Success Factors that affect the ICT start ups in Gaza using The (AHP).

The questionnaire includes two types of pair-wise comparison:

**First:** Main criteria pair-wise comparison and their importance in prioritizing CSF's for ICT enterprises working in Gaza.

**Second:** Sub-criteria pair-wise comparison

In order to achieve this aim, it is highly appreciated if you kindly fill the questionnaire by giving your own opinions of the comparison of the main criteria together, and then to the sub-criteria under each main criterion, the accuracy of the results depends dramatically on these valuable data.

This research will help decision makers at academic institutions to implement major changes in academic plans to reflect entrepreneurial skills among their graduates as well as other complementary skills required for establishing new ICT startups, it will also help decision and policy makers in formal and informal institutions to adopt the best model of business incubation suitable for the Gaza Strip ICT startups.

All of data collected will be guaranteed the confidentiality and used **ONLY** for scientific purpose which the researcher needs for his MBA degree thesis.

Thanks in advance for your contribution in enhancement of scientific research process in the Gaza Strip.

Supervisor

Researcher

Prof. Dr. Yousif H. Ashour

Nader R. Abdelnaby

## Part I

### General Information and intrusions

Name: .....

**Filling instructions:**

The numbers from (1 – 9) are used for showing the preference or the importance in the comparison as shown in the following table:

Number	Description
1	The criterion (x) is of the same importance of criterion (y)
3	The important of criterion (x) is 3 times the important of criterion (y)
5	The important of criterion (x) is 5 times the important of criterion (y)
7	The important of criterion (x) is 7 times the important of criterion (y)
9	The important of criterion (x) is 9 times the important of criterion (y)
2, 4, 6, 8	The important of criterion (x) is 2, 4, 6, 8 times the important of criterion (y)

**Illustrative example:**

Marketing sub-criteria	Marketing	Intensity of competition	R&D
Marketing		3	1
Intensity of competition			1/5
R&D			

**3:** means that the importance of “Marketing” is 3 times the importance of “intensity of competition”

**1:** means that the importance of “Marketing” is the same as the importance of “R&D”

**1/5:** means that the importance of “R&D” is 5 times the importance of “Intensity of competition”

**Note:** Shaded cells are filled automatically by the reciprocals of its diagonal counterparts.

## Part II

### Main criteria pair-wise comparison

Main Criteria	Human Resources	Entrepreneurs' characteristics	Financial	Product/Service characteristics	Marketing	Incubator roles	Environmental Conditions	Organization characteristics
Human Resources								
Entrepreneurs' characteristics								
Financing								
Product/Service characteristics								
Marketing								
Incubator roles								
Environmental Conditions								
Organization characteristics								



## Part III

### Sub-criteria Pair-Wise Comparison

#### 1. Human Recourses sub-criteria pair-wise comparison

Sub-Criteria	Experience	Education	Managerial performance and skills
Experience			
Education			
Managerial performance and skills			

#### 2. Entrepreneurs' characteristics sub-criteria pair-wise comparison

Sub-Criteria	Creativity,	Leadership	Risk Taking	Team Working
Creativity				
Leadership				
Risk Taking				
Team Working				

#### 3. Financials sub-criteria pair-wise comparison

Sub-Criteria	The initial Investment	Finance & accounting
The initial Investment		
Finance & accounting		

#### 4. Products/Service characteristics sub-criteria pair-wise comparison

Sub-Criteria	The uniqueness of the Products/Services	Product/Service Price & Quality	Customer during & after sales service
The uniqueness of the Products/Services			
Product/Service Price & Quality			
Customer during & after sales service			

### 5. Marketing sub-criteria pair-wise comparison

Sub-Criteria	Marketing	Intensity of competition	R&D
Marketing			
Intensity of competition			
R&D			

### 6. Incubators' role sub-criteria pair-wise comparison

Sub-Criteria	Integrate SME's with market and society	Training, Consultancy and Mentoring Provided
Integrate SME's with market and society		
Training, Consultancy and Mentoring Provided		

### 7. Environmental Conditions

Sub-Criteria	Political and economical stability	Governmental and non-governmental support	Working conditions/ environment	Copyright and Intellectual Property Rights
Political and economical stability				
Governmental and non-governmental support				
Working conditions/environment				
Copyright and Intellectual Property Rights				

### 8. Organization Characteristics

Sub-Criteria	Organizational Structure	Firm's Established year
Organizational Structure		
Firm's Established year		

*Kindly accept our greetings, Thank you*

*Date:* .....

*Signature:* .....

## Appendix C: Experts background and information

	Name	Organization	Job title	Sector	Experience	Education
1.	Mohammed Skaik	Islamic University of Gaza-Business and Technology incubator	Director	Donors	3-7 years	Master M.Sc.
2.	Saleem F. Shaath	Islamic National Bank- Small Enterprises Finance	Manager	Private	3-7 years	Bachelor B.Sc.
3.	Saeed H. Abdelrhim	Mercy Corps- Gaza Sky Geeks Accelerator	Manager	INGO	3-7 years	Master M.Sc.
4.	Yousef Alhallaq	Midad for Technology Development	Director	Private	3-7 years	Bachelor B.Sc.
5.	Tarik M. Esleem	Al-Tarik for IT systems and Projects PICTI*	Director at Al-Tarik Vice Chairman at PICTI	Private & NGO	More than 7 years	Master M.Sc.
6.	Khaled A. Dahleez	Islamic University of Gaza- Faculty of Commerce	Assistant Professor	Academic	More than 7 years	Doctorate Ph.D.
7.	Tarik A. Thbet	Mobaderoon Program	Manager	Donors	3-7 years	Bachelor B.Sc.
8.	Mamoun Bsieso	Freelancing trainer and consultant	Business advisor	Donors	More than 7 years	Master M.Sc.
9.	Mohammed A. Alafranji	SADAF Technology Development	CEO	Private	More than 7 years	Bachelor B.Sc.

\*PICTI: Palestinian Information and Communications Technology Incubator