# The Effect of External Factors on Users' Perceptions toward the Electronic Services at the Ministry of Education - Gaza and Their Impact on Users Acceptance

أثر العوامل الخارجية على انطباعات المستخدمين تجاه الخدمات الإلكترونية بوزارة التربية والتعليم – غزة وأثر هذه الإنطباعات على تقبل المستخدمين للنظام

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A Thesis Submitted in Partial Fulfilment
of the Requirements for the Degree of
Master of Business Administration

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# إقـــــرار

**أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:**

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## أثر العوامل الخارجية على انطباعات المستخدمين تجاه الخدمات الإلكترونية بوزارة التربية والتعليم – غزة وأثر هذه الإنطباعات على تقبل المستخدمين للنظام

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الجــامعة الإسلامية ـ غـزة
**The Islamic University of Gaza**

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## نتيجة الحكم على أطروحة ماجستير

بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغـزة علـى تشكيل لجنة الحكم على أطروحة الباحث/ **محمد زايد عبد فارس** لنيل درجة الماجستير فـي كليـة *التجارة/ قسم إدارة الأعمال* وموضوعها:

أثر العوامل الخارجية على انطباعات المستخدمين تجاه الخدمات الإلكترونية بوزارة التربية والتعليم - غزة وأثر هذه الانطباعات على تقبل المستخدمين للنظام

**The Effect of External Factors on Users' Perceptions toward the Electronic Services at the Ministry of Education - Gaza and Their Impact on Users Acceptance**

وبعد المناقشة التي تمت اليوم السبت 01 رمضـان 1438 هـ، الموافـق 2017/05/27م الساعة الواحدة مساءً، اجتمعت لجنة الحكم على الأطروحة والمكونة من:

| | | |
|---|---|---|
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| د. سناء وفا الصايغ | مناقشاً خارجياً | ............... |

وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في كلية *التجارة/ قسم إدارة الأعمال.*

واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق ،،،

نائب الرئيس لشئون البحث العلمي والدراسات العليا

أ.د. عبدالرؤوف علي المناعمة

# Abstract

Most modern organisations seek to adapt information systems to improve performance and develop their services and work methods. But some systems adaptations failed and did not gain the planed results. Several studies were conducted to explore the factors affect information systems adaptation success. Many previous studies found that *User Acceptance* is one of the most important factors affecting information systems implementation success. Furthermore, according to Technology Acceptance Model (TAM), users' perceptions about *Ease of Use* and *Usefulness* toward system have significant influence on users' *intention to use* and actual use of a system.

This study aims to explore the impact of seven external factors on users' perceptions toward the recently adapted Eservices system in the Ministry of Education- Palestine, and evaluate the impact on users' acceptance, using (TAM).

The study model was developed based on modified (TAM) model. It used TAM2 standardized questionnaire to gather data. The researcher used comprehensive survey method to gather data from about 14575 employees using the system and 612 questionnaires were filled in. The gathered data analysed by SPSS 20 and SmartPLS v3.2.6 using PLS-SEM analysis to explore relations between study variables.

Study findings revealed positive relationships between (Prior experience, Job Relevance, Output Quality and Result Demonstrability) and *Perceived Ease of Use* ($R^2 = 0.415$) and positive relations between (Image, Job Relevance, Output Quality and Result Demonstrability) and *Perceived Usefulness* ($R^2 = 0.394$). It also revealed that their exist significant positive relationship between *Perceived Ease of Use* and *Perceived Usefulness with* users' *intention to use* ($R^2 = 0.333$) which is consistent with (TAM) hypothesis.

The study highlighted the importance of the role of both training and orientation of systems as well as systems simplicity, their relevance to employees' job tasks and designing systems according to the vision of employees, on their acceptance of information systems and chances of success. It also recommended applying an in-depth study of each Information system of Eservices separately.

# الملخص

تسعى العديد من المنظمات حديثاً لتطبيق أنظمة معلومات محوسبة سعياً منها لتطوير خدماتها وتحسين أدائها، وقد عقدت الكثير من الدراسات لإستكشاف أسباب فشل تطبيق بعض الأنظمة. وقد أشار العديد من هذه الدراسات أن من أهم هذه الأسباب هو ضعف تقبل الموظفين للأنظمة الجديدة. وحسب نموذج تقبل التكنولوجيا (TAM) فإن انطباعات المستخدمين حول سهولة الإستخدام والفائدة من الإستخدام لها أثر واضح على تقبلهم لأنظمة المعلومات.

تهدف هذه الدراسة لإستكشاف تأثير سبعة من العوامل الخارجية على انطباعات المستخدمين تجاه نظام الخدمات الإلكترونية الذي تم تطبيقه مؤخراً بوزارة التربية التعليم بغزة وتقييم دورها في نجاح تطبيقه وذلك من خلال تطبيق نموذج معدل من نموذج تقبل التكنولوجيا (TAM) . حيث استخدم الباحث استبانة (TAM2) المعيارية لجمع البيانات حول انطباعات الموظفين حول النظام ومدى رغبتهم في استخدامه. وقد قام الباحث بجمع البيانات من خلال أسلوب الحصر الشامل لجميع مستخدمي النظام وتم استرداد 612 استبانة.  وقد تم تحليل البيانات التي تم جمعها بواسطة برنامج SPSS 20 وبرنامج SmartPLS 3.2.6 واستخدام تحليل PLS–SEM للتعرف على العلاقات بين متغيرات الدراسة. وقد تبين وجود تأثير موجب من كل من (الإرتباط بالوظيفة، جودة المخرجات، إثباتية النتائج والسمعة) على الفائدة المدركة (Perceived Usefulness) (R2=0.394) وكذلك تأثير موجب من كل من (الخبرات السابقة، الإرتباط بالوظيفة، جودة المخرجات وإثباتية النتائج) على السهولة المدركة (Perceived Ease of Use) (R2=0.415). كذلك تبين تأثير الفائدة المدركة و السهولة المدركة على الرغبة في الإستخدام (Intention to Use) (R2=0.333) مما يتوافق مع فرضيات نموذج تقبل التكنولوجيا.

وقد خلصت الدراسة إلى أهمية دور كل من التدريب والتعريف بالأنظمة وكذلك سهولتها وارتباطها بمهام العمل وتصميمها وفق رؤية الموظفين، في تقبلهم لأنظمة المعلومات وتحسين فرص نجاحها. كما أوصت بتطبيق دراسة معمقة لدراسة كل نظام من أنظمة الخدمات الإلكترونية على حده.

بِسْمِ اللهِ الرَّحْمَنِ الرَّحِيمِ

وَقُل رَّبِّ زِدْنِي عِلْمًا ﴿١١٤﴾

[طه: 114]

# Dedication

To my beloved mother and my beloved father

whose love, care, and support have inspired me to achieve my ambitions


To my beloved life partner, my wife, and our children Sarah and Rema


I dedicate this study


Mohammed Fares

# Acknowledgement

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# List of Abbreviations

| | |
|---|---|
| **EL** | Educational level |
| **ERP** | Enterprise resource planning |
| **ICT** | Information and Communication Technologies |
| **IM** | Image |
| **IS** | Information System |
| **IT** | Information Technology |
| **JR** | Job relevance |
| **MIS** | Management Information System |
| **MoEHE** | Ministry of Education and Higher Education |
| **OQ** | Output quality |
| **PE** | Prior experience |
| **PEOU** | Perceived Ease of Use |
| **PU** | Perceived Usefulness |
| **RD** | Result demonstrability |
| **SMIS** | School Management Information System |
| **SN** | Subjective norms |
| **TAM** | Technology Acceptance model |
| **UNICEF** | United Nations Children's Fund |

# Chapter 1
# Introduction

# Chapter 1

# Introduction

## 1.1    Introduction

Information and communications Technology became a vital tool in modern organizations. According to rapid changes in organization's internal and external environment and a significant support that information systems (IS) provide the organization, most of organizations trend to invest and implement information systems seeking for efficiency, effectiveness and best understanding of organization environment for wise decision making. Nowadays, most organizations use ICT to support their activities and business management, and to transform their work methods and services.

Furthermore, many governments around the world started to adapt Information systems to improve its administrative tasks and to reform the methods of providing services to citizens. Some governments launched e-government initiatives. E-government can be defined as using of ICT by government in providing public services. The successful adaptation of e-government will improve the public administration efficiency and reform the ways of providing public services.

Many years ago, the Palestinian government launched the e-government initiative and adapted several Information systems in many public organizations (MTIT, 2016). Many ministries transform its services to Eservices through internet and adapted information systems to improve internal business processes.

In 2008, Palestinian Government made a decision to invest in information systems tools to increase efficiency and improve work, and to provide services in an effective and efficient way. This decision became a strategic objective for many Palestine Authority ministries including Ministry of Education and Higher Education (MoEHE) which started Enterprise Resource Planning (ERP) implementation supported by UNICEF. This implementation required a comprehensive change in business processes and a systematic management of change process. IT department reports and published data of the ministry show a successful implementation of Eservices in 2012. This research is an empirical study that tries to examine the influence of some factors on perceived ease of use and perceived usefulness toward the recently implemented eservice in the Palestinian Ministry of Education and Higher Education (MoEHE) and how these factors influence end users' acceptance and usage. It is difficult to study all public organizations information systems adaptations in this study so we will take MoEHE as a case study and future studies may conducted to investigate other information systems implementations in other organizations.

The adaptation of new technologies may rejected by end users which may affect the success of implementation. Number of research studies was conducted to understand deeply the determinants of using new technologies by using intention-based approach. The "Technology Acceptance Model" (TAM) (F. D. Davis, 1989) is one of the best intention-based models." It tries to identify why users may reject or accept information technology. TAM explains the usage of new technology by the user intention to use technology. The user intention is determined by user's perceived ease of use and perceived usefulness toward that system. Also some external factors may influence user's perceived ease of use and perceived usefulness which make indirect effect on the intention to use and the usage of information system. Many studies were conducted and made modifications and customizations on the TAM.

## 1.2    Problem statement

Using Information systems became common in modern organizations. The efficiency and success of the organization affected heavily by the degree of using modern ICT. A noticeable reason that causes failure of new systems implementation in organizations is user resistance. A survey conducted at 375 organizations in different countries identified that the first-ranked challenge faced large-scale information systems adaptation is user resistance and lack of user acceptance (Kim & Kankanhalli, 2009). The Palestinian government in Gaza Strip started to implement information systems in several public organizations as parts of "e-government initiative (MTIT, 2016). Some of these systems have been faced by end users resistance, others accepted by users which affect the success of implementation. The TAM (F. D. Davis, 1989) were hypothesized that two variables (ease of use, perceived usefulness) can predict an end users' intentions to use technology. Researcher found that some studies made several customizations on the original TAM, to help in explaining the influence of external factors on perceptions of user. The Ministry of Education and Higher Education in Gaza (MoEHE) implemented Eservices internally in 2012. IT department reports and an interview with director of Database department in the ministry show a successful implementation of Eservices (Bader, 2017).  This study tries to examine the influence of some external factors on perceived usefulness and perceived ease of use toward the recently implemented Eservices in the (MoEHE) and their effect on users' intentions to use. So the research problem can be summarized by answering the following question:

*What is the impact of external factors on the users' perceptions toward the recently implemented E-services in the (MoEHE) and how these perceptions affect intention to use?*

## 1.3     Objectives of study

This study aims to examine the impact of some external factors on the users' perceptions (Perceived ease of use & perceived usefulness) about E-services in the Ministry of Education – Gaza, and the impact on the users' acceptance and usage of the system. So the objectives of study can be summarized as follows:

1) To examine to what extent external factors affect the users' perceptions ("Perceived ease of use & perceived usefulness") toward the Eservices of the MoEHE- Gaza.
2) To identify the external factors those affect the Eservice implementation success in the MoEHE.
3) To explore the opinions of the staff members regarding their acceptance for the technology adopted for the Eservices
4) To provide IT managers and researchers with knowledge about the factors those influence the success of MIS.

## 1.4     Importance of the study

### 1.4.1   Importance to the researcher

The study provides the researcher with information about the effect of many external factors on success of new information systems implementation.

### 1.4.2   Importance to the university

According to the researcher knowledge, This research is the first in the Islamic University - Gaza that studies the success of MoEHE information systems adaptation by using Technology Acceptance Model (TAM) which is established as a robust and powerful model for predicting users acceptance of technology.

### 1.4.3   Importance to the public sector

This research will provide Ministry of Education and other public sector organizations with useful information about the effect of many external factors on the users' acceptance and actual usage of newly implemented information systems. This information makes better understanding and improves capacity for successfully implementing Information Systems. As a result it will lead to avoid future Information Systems implementation failures.

## 1.5    Study Framework and Variables

### 1.5.1  Independent variables

Seven independent variables separated into three main groups:

1) **First Group:** Individual differences.

   Includes two variables:

   1- Educational level.
   2- Prior experience.


2) **Second Group:** Task relevance.

   Includes two variables:

   1- Job relevance.
   2- Output quality.
   3- Result demonstrability.


3) **Third Group:** Surrounding environment.

   Includes two variables:

   1- Subjective norms.
   2- Image.


### 1.5.2  Mediation variables

1) Perceived usefulness (PU).
2) Perceived ease of use (PEOU).


### 1.5.3  Dependent variable

- Intention to use

## 1.5.4 Study model

Independent factors        Mediation factors        Dependent factor

Individual differences

Prior experience

Educational level

External
Factors

Task relevance

Job relevance

Output quality

Result demonstrability

Surrounding environment

Subjective norm

Image

Perceived
usefulness

Perceived
ease of
use

Intention
To
Use
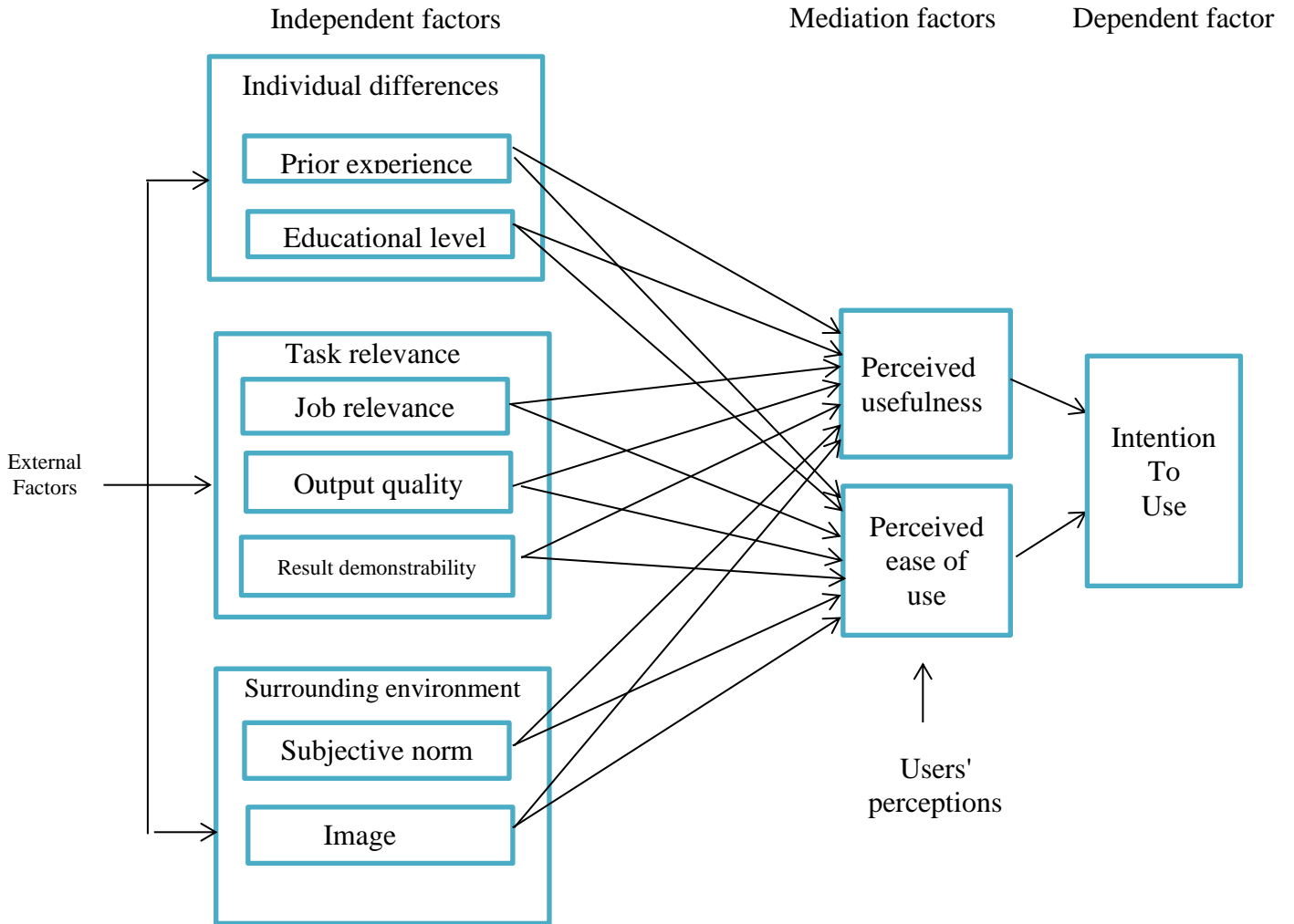
Users'
perceptions

**Figure (1.1): Customized TAM model (Vathanophas, Krittayaphongphun, & Klomsiri, 2008)**

## 1.6 Study Hypotheses

To examine the impact of external factors on user's perceptions toward MoEHE Eservices ("perceived usefulness" and "perceived ease of use"), the researcher formulated the following hypotheses that grouped into three main groups:

**First main group**

The first main group is "Individual differences", it includes two variables: "Educational level" and "Prior experience". Hence the following hypotheses generated:

**H1:** There is a statistical significant relationship between "Educational level" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H2:** There is a statistical significant relationship between "Educational level" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.

**H3:** There is a statistical significant relationship between "Prior experience" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H4:** There is a statistical significant relationship between "Prior experience" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.

**Second main group**

The second main group is "Task relevance", it includes three variables: "Job relevance", "Output quality" and " Result demonstrability ". Hence the following hypotheses generated:

**H5:** There is a statistical significant relationship between "Job relevance" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H6:** There is a statistical significant relationship between "Job relevance" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.

**H7:** There is a statistical significant relationship between "Output quality" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H8:** There is a statistical significant relationship between "Output quality" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.

**H9:** There is a statistical significant relationship between "Result demonstrability" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H10:** There is a statistical significant relationship between "Result demonstrability" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.


**Third main group**

The third main group is "Surrounding environment", it includes two variables: "Image" and "Subjective norms". Hence the following hypotheses generated:


**H11:** There is a statistical significant relationship between "Image" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H12:** There is a statistical significant relationship between "Image" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.

**H13:** There is a statistical significant relationship between "Subjective norms" and "Perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H14:** There is a statistical significant relationship between "Subjective norms" and "Perceived usefulness" about the MoEHE Eservices at 0.05 level.


Also to examine the impact of mediation factors on user's intention to use MoEHE Eservices, the researcher formulated the following hypotheses;

**H15:** There is a statistical significant relationship between "Perceived ease of use" and "intention to use" about the MoEHE Eservices at 0.05 level.

**H16:** There is a statistical significant relationship between "Perceived usefulness " and "intention to use" about the MoEHE Eservices at 0.05 level.

## 1.7    Key Terms Definitions

**Enterprise resource planning (ERP)**

Comprehensive software packages that used to integrate various functions and business process which create a complete and integrated view of the business from a unified information system (Gable, 1998).

**End user:**

The firm employees who use an information system not information technology experts but using it to do their job tasks (Costabile, Fogli, Mussio, & Piccinno, 2007).

**Technology acceptance model (TAM)**

A specific theory designed for information technology which hypothesizes perceived usefulness and perceived ease of use are the major traits related to end users intentions toward acceptance of information technology  (F. D. Davis, 1989).

**Perceived ease of use (PU)**

The extent of the belief that using a specific information system will be effortless  (F. D. Davis, 1989).

**Perceived usefulness (PEOU)**

The extent of the belief that using a specific information system will improve job performance and provide rewards or benefits to the user  (F. D. Davis, 1989).

**User acceptance**

The obvious intention to use information technology in accordance with functions and purpose of the technology to accomplish tasks on the job  (Yucel & Gulbahar, 2013).

## 1.8    Structure of the Thesis

The study is divided into six chapters; **Chapter One** contains general introduction and talks briefly about Information systems and user acceptance. It also presents a statement of the problem, the objectives of the study, its scope, significance and limitations. **Chapter Two** contains Literature review, it summarizes literature related to the TAM and the factors affecting information systems users' acceptance and actual use and their effects on the success of implementation. **Chapter Three** includes previous studies, it contains one section. It presents previous studies related to the title containing the researcher comments and notes. **Chapter Four** contains Methodology and Research design, it presents the study purpose, the study design, data gathering approaches, the population and sample. **Chapter Five** contains Data Analysis, within this part the researcher will apply Data Analysis Plan and tools to analyze the data that were gathered in chapter 4 and identify the effect of external factors on "perceived ease of use and perceived usefulness" and their effects on user intention to use information system. And finally **Chapter six** which contains Recommendations and conclusion, it contains summary of the study and its results, Conclusion, recommendations, and suggested future studies.

## 1.9    Chapter summary

This chapter contains general introduction. It talks briefly about Information systems and their impact on organizations' performance. It also gives background information of ERP system and how it transforms the ways of work and provision of services in modern organizations. It also talks about user acceptance and the Technology Acceptance Model (TAM). It contains the research model, hypothesizes and study framework. This chapter also presents a statement of the problem, the objectives of the study, its scope, significance and limitations.

# Chapter 2
# Literature Review

<div align="center">

**Chapter 2**

**Theoretical Framework**

</div>

<u>**Section I**</u>

## 2.1 Information system (IS)

### 2.1.1 Introduction

The fast development of modern technology is expanding organization's desire to solve complex problems with computer assistance. Information systems are becoming very important in modern organizations and can influence decision-making functions in an organization. Most of organizations tend to invest and implement information systems seeking for efficiency, effectiveness and best understanding of organization environment for wise decision making. The need to transform the methods of doing work and to get results conveniently, quickly and efficiently makes it important to adapt Information systems. Information technology adaptation in organization offers the potential for greatly improving the employees and organization performance.

### 2.1.2 The information systems concept

To understand what Information system mean, it is necessary to understand the concepts of data, information, data processing and a system. There are many definitions for the term information, one of these definitions: "The data processed for a purpose". Where the data is an event or a fact that is recorded and that is related to a specific business or financial transaction. This data before processing is not useful until it is processed, after processing we can call it information. Information derived from data processing may be communicated for a particular purpose. Also, this information can be used to make important decisions related to planning and control. The formally handled data in a business may undergo complex processing before presentation and use of information . Types of processing are (Curtis & Cobham, 2008):

- Data Classification;
- Data Rearranging/sorting;
- Data Summarizing/aggregating;
- Performing calculations on data;
- Data Selection.

Information systems at organizations in the beginning were only for data processing and evolved gradually to complex management information systems. Recently, organizations trend to adapt strategic information systems (Lavtar, 2013). According

to rapid changes in organization's internal and external environment and a significant support that information systems (IS) provide the organization, most of organizations tend to invest and implement information systems seeking for efficiency, effectiveness and best understanding of organization environment for wise decision making. When combined with development in business practices and management methods and practices, Information systems and Information technology can be one of the best tools that administrators can use to achieve better levels of organization productivity & efficient business processes. (Laudon & Laudon, 2016).

### 2.1.3 The information systems definition

Generally, system is defined as a set of interrelated elements that accumulate to form a unified whole (Parker & Case, 1993). The researcher defined system as a group of tangible things, logical ideas and mutual relations that are directed to achieve a goal or common goals.

We can simply imagine information systems as systems that accept raw data and process it using single or multiple processes to generate useful information as output (Adeoti-Adekeye, 1997).

Information system is defined by Duffy and Assad (1980) as: "A collection of people, procedures, a base of data and (sometimes) hardware and software that collects, processes, stores and communicates data for transaction processing at operational level and information to support Management decision making".

Information system may also defined as a combination of hardware, software, infrastructure and trained personnel working together to facilitate planning, control, coordination, and decision making in an organization (BusinessDictionary.com, 2016)

Laudon and Laudon (2016) defined Information system technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in the organization .

### 2.1.4 Benefits of information systems to organizations

Information systems can support managers and other employees in analyzing information, visualizing complex subjects, and provide better products and services (Laudon & Laudon, 2016). They can play a vital role in modern businesses. Information systems can support organizations in improving goals, targets and strategies (Lipaj & Davidavičienė, 2013). Recently, an increasing number of organizations invest into information systems adaptation to increase efficiency and to improve organizations' overall performance. Investment in information systems adaptation may help the organizations to transform business processes and the methods of providing services which give opportunity to achieve higher level of efficiency.

information system can generate information needed to organization which improve decision making, operation control, problem analysis and developing better product and service using three activities: Input, Processing and output: (Laudon & Laudon, 2016):

- Input:

It captures raw data from its sources internally or externally.

- Processing:

Processing covert the raw data to a meaningful information.

- Output:

Make the processed information available to persons who need it or to activities that may use it.

Information technologies are critical to most information systems, which are typically designed to handle huge amounts of data, perform complicated tasks, and control huge number of simultaneous functions. All these technologies, along with the staff needed to operate and administer them, make up the infrastructure of the information technology in the enterprise, which form the platform that the enterprise used to build its information system (Adeoti-Adekeye, 1997). Generally, any Information System consists of five components, they are: software, hardware, persons, procedures and data.

There are various types of information systems, for example:

- *Management information systems*
- *Transaction processing systems*
- *Decision support systems*
- *Expert systems*
- *Office Automation*
- *Business intelligence*

## 2.2 Management Information system (MIS)

### 2.2.1 Introduction

Most modern organizations adapt MIS to support management and improve performance. Developing and using of management information systems (MIS) leads to the obtaining of appropriate information leading to enhanced planning, wiser decisions and better outcomes (Adeoti-Adekeye, 1997). MIS consists of hardware and software that accept data as an input, then store and process the data to produce information as an output (Curtis & Cobham, 2008).

In general, developing and using of management information systems (MIS) lead to the obtaining of appropriate information leading to enhanced planning, wiser decisions and better outcomes.

### 2.2.2 The Management Information System definition

Management information system (MIS) is defined as "any system that provides information for the management activities carried out within an organization"(Curtis & Cobham, 2008). Also, MIS can be defined as "modern, computerized systems continuously gather relevant data, both from inside and outside an organization. This data is then processed, integrated, and stored in a centralized database (or data warehouse) where it is constantly updated and made available to all who have the authority to access it, in a form that suits their purpose".(BusinessDictionary.com, 2016). It is a type of information systems which get internally or externally generated data and process it to generate meaningful and useful information to help in making decision and managerial activities.

### 2.2.3 Benefits of Management Information System

According to Nath and Badgujar (2013), management information systems provide many benefits to organizations:

1  Improves appropriately responding to a business needs.
2  Facilitates of effectively and efficiently coordination between business units and managerial levels within the organizations.
3  Simplifies access to appropriate data and information.
4  Increases employees' productivity and gives the ability to labor reduction.
5  Improves the organizational and departmental business processes.
6  Facilitates managing of work activities.

## 2.3 Enterprise resource planning (ERP)

Before the ERP systems adaptation growth, each business unit in an organization gets their own separated information system that is disconnected from other systems in the organization. This isolated systems methodology makes synchronizing information across business units so difficult and the inter-department processes coordinating is time consuming and hence negatively affect the organization's performance, efficiency, productivity, and the information systems effectiveness. Using separated systems may lead to several problems, like absence of synchronization, incompatibility in data exchanging standards, lack in staff understanding of organization' activities, weak decision making.

For example, Human resources department cannot determine the needed number and specializations of teachers to recruit before starting the academic year without full coordination with planning department, educational supervision department and all educational directorates. This inter-department business process needs sophisticated software package that can synchronize work flow and information between departments. It is difficult and time consuming to accomplish this task using isolated department's software applications.

Enterprise resource planning (ERP) systems are complex software packages that support an integrated real-time setting among the various business functions in an entire organization (Oldacre, 2016). ERP is comprehensive integrated software packages that is designed and built depending on the best practices and the latest experiences in the field of business scope as it includes integrated solutions for all business organization in order to increase and improve organization's competitive advantage and performance. It is designed to coordinate all the resources and information necessary to complete the process procedures and activities through the integration of all major operations of the organization in a single system to serve the unique needs of each functional areas or departments or branches that have been linked to a single database systems to facilitate the exchange of information and improve communication throughout the organization.

The ERP systems have achieved excellent results in their abilities in improving organizations performance, improving productivity, and increasing organization efficiency across the various business processes (Lipaj & Davidavičienė, 2013).

The main objective of implementing any ERP system is to build single integrated system through integrating as many functions and capabilities as possible in this system which store all data in a unified database, which make it possible to each departments easily getting the needed information and communicating with other departments. ERP system successful implementation, give opportunity to organization to gain a significant return on investments (Tambovcevs & Merkuryev, 2009).

Therefore, deploying an integrated ERP at an enterprise leads to performance gains, better inter-department synchronization, standardization of information exchange formats, better staff understanding of organization functions, better decision making, higher level of productivity, etc. ERP system adaptation may enhance productivity, but only according to the level of end users' acceptance and usage of the system to accomplish their job tasks. The managers of several enterprises adapted ERP systems could not trace the benefits expected because of lack of end users acceptance of the system (Oldacre, 2016).


## 2.4 User Acceptance

Numerous information system implementations have not lived up to expectations and resulted in failure to achieve the promised benefits (Kumar & Malik, 2012). In addition to many failed cases, there were a few disasters resulting in the demise of organizations (Bhattacharyya & Dan, 2014). Many organizations are still having difficulties attaining the promised benefits of information systems in spite of their extensive adoption (Ha & Ahn, 2014). Furthermore, organizational leaders have not been able to identify the most substantial effects of using their information systems (Sternad & Bobek, 2013). Even though some organizations achieve success with their initial implementation, many do not benefit substantially from the systems in their post implementation stages (Ha & Ahn, 2014). Accordingly, one reason why organizations have difficulties with their systems is users are not accepting and using the systems appropriately (Sternad & Bobek, 2013). The goal of most organizational information systems is to improve performance on the job. However, the gain in organizational performance may hindered by users' lack of desire to accept and use the new systems. Performance gains are missed whenever systems are not accepted by employees. Several studies found that the success of new information systems may significantly impeded by the lack of user acceptance. It is a crucial issue to understand the elements that influence user acceptance of information systems (Al-Haderi, 2013).

It is obvious that user acceptance of newly implemented information systems have an important influence on information system adaptation success. (F. D. Davis, 1993). several studies found that the success of new information systems may significantly impeded by the lack of user acceptance (Gould, Boies, & Lewis, 1991). Lack of user acceptance substantially influences the success of many information systems implementations. Because of the existence and significance of this issue, examining user acceptance has been a long-lasting subject in information systems research(F. D. Davis, Bagozzi, & Warshaw, 1989). As a result, user acceptance has been seen as the most critical factor influencing the success or failure of any information system adaptation (F. D. Davis, 1993).

Generally, employees are not often willing to accept new information systems which, if used, the organization may get notable performance improvement. Historically, managers in organization that adapt new systems used their authorities to guarantee that the system was used by employees, especially in industrial organizations environments, furthermore, the criticized scientific management claim to the motivating employees by financial rewards to encourage them to use the systems according to the management orders.

Information systems will not achieve desired objectives to the organization if employees are unwilling to use it. Moreover, many information systems adaptation failures are believed to be caused by lack of user acceptance and ineffectiveness in system usage. This makes studying and analyzing of the variables that may affect user acceptance and usage of information system is actually vital. Wherefore, researchers detected that there are a need for researches concentrating on examining and evaluating the relations between users behavioral, attitudinal, and perceptual factors (Sun & Zhang, 2006).

The "Technology Acceptance Model" (TAM) is one of the frequently adopted models to evaluate IT innovations and to study software utilization choices of end users (Compeau & Higgins, 1995; D'Ambra, Wilson, & Akter, 2013). The "Technology Acceptance Model" (TAM) is an MIS specific model that has been developed based on the "theory of reasoned action" (TRA) to be used in examining the users' acceptance of information systems.

In this study, the researcher focuses on studying the information system success factors that are affected the employees' perception toward the information systems they use. The researcher seeks to investigate the influence of seven external factors on the users' perceptions toward the MoEHE Eservices system and the success of system through adopting customized TAM model **Figure (1.1)**.

## 2.5 Technology Acceptance Model (TAM)

The "Technology Acceptance Model" initially generated by (F. D. Davis, 1989) is known as an extensively verified model for investigating acceptance of technology **Figure (2.1)**. The TAM build on theory of reasoned action (TRA) to examine the relationships among user's perceptions (usefulness and ease of use), attitudes, intention, and information systems using behavior. Whereas TRA is an all-purpose theory appropriate to various contexts, several MIS specialized models have been built based on TRA. There are several models used to measure users' acceptance, the most broadly cited is Technology Acceptance Model (TAM). TAM became well recognized as a robust, parsimonious, and powerful model for examining user acceptance of systems (Venkatesh, 2000). The model initially formed to examine user acceptance of technologic things like information systems. F. D. Davis (1989) defined TAM as, "it is an adaptation of the theory of reasoned action (TRA) specifically tailored for modelling user acceptance of information systems". The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. A key purpose of TAM, therefore, is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions.

TAM is well-established and extensively tested model that can applied direct to examine employees acceptance of MIS such as ERP systems (Zhang, Gao, & Ge, 2013). The researcher noted in the literature review that researchers have used the TAM extensively in examining acceptance and usage of MIS. TAM model characterizes backgrounds of systems use through perceptions about two variables: ease of use (PEOU) and the usefulness (PU) toward a technology. Legris, Ingham, and Collerette (2003) conducted a Meta-analysis of 23 empirical researches that used TAM, which included "perceived ease of use" and "perceived usefulness" with other variables. Researchers found that TAM forms a powerful theoretical base. Its results are verified have quality and statistical reliability. Many researchers also verified TAM as a valuable tool to forecast the remedial actions that would be taken for efficient information system adaptation and usage in the organization (Al Jardali, Abdallah, & Barbar, 2015). Preferably, we need a model that is supportive not only for expectation but also for clarification, so that practitioners or researchers can recognize the reasons of acceptance or rejection of a particular system, and do suitable remedial actions.
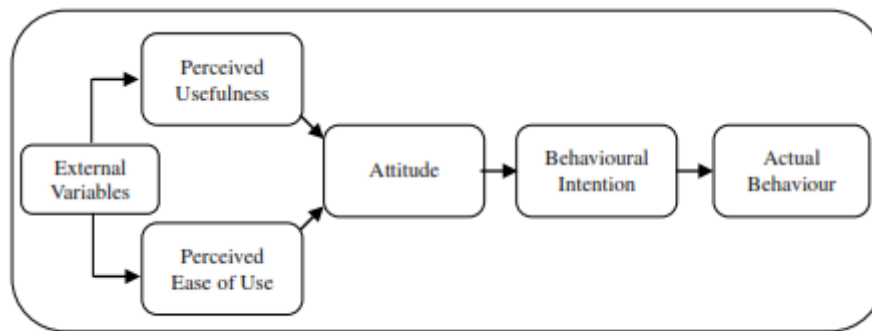
**Source:** Davis *et al.* (1989)

**Figure (2.1): Technology Acceptance Model (TAM)**

Furthermore, an increasing necessity appeared for researches that test and develop the technology acceptance model in complicated IT environment. For that reason, TAM has been developed to accomplish precise studies aims (Erasmus, Rothmann, & Van Eeden, 2015). The models got several extensions to deal with those aims. For example, (1) TAM2, was designed to assist in developing place of work intervention to improve users acceptance of newly implemented system, (2) The unified theory of acceptance and use of technology model (UTAUT), which designed for examining the success chances of newly implemented system, and (3) TAM3, was designed to assist manager and decisions maker in making workplace intervention related decisions based on accurate information (Etsebeth, 2012).

UTAUT was suggested as a theoretic improvement above previous theories that study adaptation of information systems. The influences of independent factors on dependent factors are moderated by number of moderators: gender, age, experiences, and voluntariness (Venkatesh, Morris, Davis, & Davis, 2003). But the performance consistency and reliability of this model did not proofed in different cultures and situations (Dwivedi, Rana, Chen, & Williams, 2011). On the other hand, Dwivedi et al. (2011) stated that "several meta-analysis studies have been done using the popular precursor of UTAUT model (TAM). For example, the TAM used by a huge number of studies which makes it possible for researchers to analyze trends, patterns of use, and the actual performance of the model through systematic review and meta-analysis technique".(Dwivedi et al., 2011)

Repetitions of the TAM study found that it fits with numerous types of persons, settings, culture, countries, and time, the last being a prerequisite for robust theory (Yousafzai, Foxall, & Pallister, 2007). It was found that some studies presented customizations to the TAM, seeking further explanation of external variables that may affect user perceptions (Vathanophas, Krittayaphongphun, & Klomsiri, 2008). Some studies modified original TAM for using with specific information system, such as knowledge management adoption (Sussman & Siegal, 2003), internet banking adoption (Chan & Lu, 2004), adoption of mobile services (Gefen, 2003;

Kleijnen, Wetzels, & De Ruyter, 2004), E-commerce and E-shopping adoption (Çelik & Yilmaz, 2011; Klopping & McKinney, 2004). TAM utilizes PEOU and PU as external factors, which have influence over users' attitudes, intentions to use, and actual usage (Schrier, Erdem, & Brewer, 2010). According to F. D. Davis (1989), one of the main aims of the TAM is providing a base to examine the influence of external variables on users perceptions, i.e. PU and PEOU, and their influence on actual usage.

Therefore, From technology acceptance models, the (TAM) verified to be the best comprehensively used by information systems studies in their efforts to identify the factors influence systems using behavior (Etsebeth, 2012). In this study, the research will use TAM as a base theory in determining influences of seven external variables on User's "perceived ease of use" and "perceived usefulness" toward MoEHE Eservices. The researcher used TAM in this study because of the model's ability of predicting user's acceptance of information system as clarified earlier. The external factors (independent variables) that were hypothesized to have an effect upon both the user's "perceived ease of use" and "perceived usefulness" (mediation variables) were set up by reviewing validated factors already tested in a number of empirical studies (Vathanophas et al., 2008). The relationship between every external variable and the users' perceptions will be shown. For simplification and to provide a clearer of view regarding external factors, the researcher divided the external variables (independent variables) according to their characteristics to three groups. The groups are:

1) **First Group:** Individual differences.

   Includes two variables:

   1- Educational level.
   2- Prior experience.

2) **Second Group:** Task relevance.

   Includes three variables:

   1- Job relevance.
   2- Output quality.
   3- Result demonstrability.

3) **Third Group:** Surrounding environment.

   Includes two variables:

   1- Subjective norms.
   2- Image.

## 2.6 Dependent variable

### 2.6.1 Intention to use

The technology acceptance model consists of six related constructs, namely external variables, perceived ease of use, perceived usefulness, attitude towards using, behavioral intention to use and actual system use (Koh, Prybutok, Ryan, & Wu, 2010). In the technology acceptance model, perceived ease of use and perceived usefulness determine an individual's information systems acceptance (Surendran, 2012) by determining their attitude towards using and subsequent behavioral intention to use, which culminates in actual system use (J.-H. Wu & Wang, 2005).

External variables are therefore a bridge between internal beliefs, attitudes and intentions represented in the technology acceptance model and various individual differences, situational restrictions and organizational interventions imposing on behavior (Guritno & Siringoringo, 2013). Identifying external variables and recognizing their impact enables system developers to manipulate these variables and in so doing have better control over user attitude towards using and behavioral intention to use and the subsequent enhanced actual system use (Hong, Thong, & Wai-Man Wong, 2002).

The technology acceptance model further proposes that computer usage is ensured by behavioral intention to use, which predicts a user's intention to perform an intentional act such as deciding to accept and use an information system. Behavioral intention to use has also been found to accurately predict the actual use of a computer information system (Guritno & Siringoringo, 2013). Behavioral intention to use is influenced by attitude towards using and perceived usefulness (Guritno & Siringoringo, 2013).

## 2.7 Mediation variables

F. D. Davis (1989) stated that there are many variables that may influence system intention to use, among of these variables previous researches suggests two determinants that have noticeable influence. First, person tends to using or not using a system according to how he believes it may be helpful for him in performing his tasks better. This is called "*Perceived Usefulness*". furthermore, even if potential user believe that the system is useful for his tasks, he may, at the same time believe that system is not easily to use and the performance enhancement of using system is dominated by efforts exerted in usage of system .So, in beside the usefulness, using the system is theorized to be affected by a second factor called "*Perceived Ease of Use*".

### 2.7.1  Perceived Usefulness

It is defined by F. D. Davis (1989) as  How much end users believe that the information system usage in his work will enhance outputs and performance of his tasks. employees are usually encouraged to enhance their performance by raising in salaries, bonuses, promotions, and other rewards (Pfeffer, 1982). When we have an information system with highly beliefs of usefulness, users believe that there exist a positive correlation among using information system and performance.

In this study, the "Perceived Usefulness" means the feeling that employees hold toward the improvement in their jobs performance when they use MoEHE Eservices.

### 2.7.2  Perceived Ease of Use

"Ease of use" in contrast, means how much end users believe that the information system usage in his work will be difficult free or effortless (F. D. Davis, 1989). The definition of "ease of use" concluded from "ease" definition: "freedom from difficulty or great effort". Ignoring the effect of other variables, the system that the user believes that its easy to use is more likely to be acceptable by user than alternative (F. D. Davis, 1989).

In this study, the "Perceived Ease of Use" means the level of easiness that employees feel when they use MoEHE Eservices.

## 2.8 Independent variables

Many researchers found that Individual differences have significant influence on users' acceptance of information system (Agarwal & Prasad, 1999; Mahmood, Hall, & Swanberg, 2001). According to literature review, the researcher hypothesizes for each factor in this group that it tends to have the capabilities to influence users' perceptions "Perceived Ease of Use and Perceived Usefulness" toward MoEHE Eservices.

The researcher grouped external factors into 3 main groups according to factors' characteristics: Individual differences, task relevance and Environmental surroundings.

Previous empirical studies found that External factors in the first and second groups have a significant influence on users' acceptance of information system, for example, the "cognitive instrumental process" (Venkatesh, 2000) and "task-technology fit" (Goodhue & Thompson, 1995), so the researcher hypnotizes that variables in these groups will have the capabilities to affect users' perceptions "Perceived Ease of Use and Perceived Usefulness"  toward MoEHE Eservices.

The hypotheses for external factors in third group are based on empirical studies of (Mahmood et al., 2001) and (Thatcher, McKnight, & Ahuja, 2002). According to results of these studies, the researcher hypnotizes that variables in this group will have the capabilities to affect users' perceptions "Perceived Ease of Use and Perceived Usefulness" toward MoEHE Eservices.

### 2.8.1 Prior experience

Szajna (1996) proposed adding "experience" variable in the studies adapting TAM, as a result, "experience" is added and hypothesized to have a strong influence in information system acceptance. Generally, previous study has recognized a positive relation between "experience" and information technology (Harrison & Rainer Jr, 1992). However, the acceptance of new information systems is not necessarily affected by all types of experience. For example, user resistance related with changing to a very different technology can balance any positive improvements caused by experience. In similar situations, (Scholtz & Wiedenbeck, 1990) detected negative influence when software developers moved to a radically new programming environments.

In this study, prior experience assessed by getting employees years of experience while using computer in his work, or using comparable systems and their present level of skills with the system and other systems.

### 2.8.2 Educational level

The literature review shows that many previous studies suggested that education level is positively related to information technology acceptance. D. L. Davis and Davis (1990) conducted a research that studied "training techniques" and "personal characteristics" in training session of end user. The study detected a significant relation between "educational level" and performance during training.

Therefore, educational level can enhance a potential user's capabilities in learning and, then, it can positively influence his beliefs toward usefulness and ease of use of system and his acceptance of system.

These results suggest that the end users' level of education may have a positive effect onto the usefulness and ease of use beliefs about an information system.

In this study the "educational level" identified using questionnaire and consists five levels: Less than Diploma – Diploma – Bachelor degree – master degree – doctorate degree

### 2.8.3  Job Relevance

"Job Relevance" defined by Venkatesh and Davis (2000) as "an individual's perception regarding the degree to which the target system is applicable to his or her job". In other words, "job relevance" can be seen as the extent of the system capability to support and do the end user's work tasks.

TAM2 hypothesized that there is a significant relation between user perceptions of "Job Relevance" and "perceived ease of use" of a system.

Vathanophas et al. (2008) research also showed that there exists a significant relationship between "job relevance" and "perceived usefulness". Goodhue and Thompson (1995) stated that "When information technology provides features and supports that relate and fit to the characteristics and requirements of a task, the users will find it useful, and tend to have positive attitudes toward new information technology".

In this study, "Job Relevance" identified by measuring the employees beliefs about the extent of Eservices' features are fit and related to the requirements of their job tasks.

### 2.8.4  Output quality

"Output quality" is defined as "the degree to which an individual judges the effect of a new system." (Venkatesh & Davis, 2000). We can understand "Output quality" as the extent of end user's belief that a system can achieve job tasks and the quality of system outcomes when performing each task. TAM2 hypnotized that end user will consider the quality of system performing of job task ("Output quality") (Venkatesh & Davis, 2000). According to this hypothesis, we conclude that when giving user the freedom to choose between "multiple relevant systems", user will recommend choosing usage of the system that provides higher degree of "Output quality". The relation between perceived "Output quality" and "perceived usefulness" also has been Empirically identified by F. D. Davis, Bagozzi, and Warshaw (1992).

In this study, "Output quality" identified by measuring the employees' beliefs about the level of MoEHE Eservices' outcomes quality when performing their jobs tasks.

### 2.8.5  Result demonstrability

"Result demonstrability" is defined by Moore and Benbasat (1991) as "the extent of results tangibility of using the innovation". Venkatesh and Davis (2000) found that adaptation of information systems "including effective systems" may suffer failing to be accepted by end users if they could not easily attribute job performance improvements specifically to their usage of information system. The TAM2 theorizes

that "result demonstrability" will have a direct effect on "perceived usefulness". Venkatesh and Davis (2000) stated that "individuals can be expected to form more positive perceptions of the usefulness of a system if the covariation between usage and positive results is readily discernible."

On the other hand, if the results generated by an information system are effective and job relevant, but in a way that is not clear to user the cause of these results, user is not likely to recognize the usefulness of the system. In other words, with a system have little "result demonstrability", user may relate his achievements to work behaviors instead of using the system (MEI-YING WU, 2011). Also, TAM2 hypothesized that there is a significant relation between user perceptions of "result demonstrability" and "perceived of ease of use" toward an information system. Empirically, Agarwal and Prasad (1997) found a significant relationship between "result demonstrability" and "intention to use" an information system.

In this study, "Result demonstrability" identified by measuring employees' ability to easily attribute job performance improvements specifically to their usage of MoEHE Eservices.

### 2.8.6    Subjective norm

"Subjective norm" is included as a direct determinant of "behavioral intention" in "Theory of Reasoned Action" (Fishbein, 1975) which was a key theoretical base in building the technology acceptance model. "Subjective norm" is defined as a "person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein, 1975). Many researchers conducted user acceptance studies examined the influence of subjective norms on intentions. Not all results of these studies are equal. For example, Mathieson (1991) did not find significant influence of "subjective norm" on intentions, while S. Taylor and P. A. Todd (1995) found a significant influence.

In this study, "Subjective norm" identified by measuring employees' perception that most colleagues who are important to him think he should use MoEHE Eservices.

### 2.8.7   Image

"Image" defined as " the belief of a group important to an individual that a certain behavior should be implemented and implementation of this behavior by the individual can persistently enhance the quality of internal works of the organization"(Vathanophas et al., 2008) . persons often affected by social influences to create or retain a positive image between his reference group, It means (for example, using a system), then will tend to elevate his or her standing within the group (Vathanophas et al., 2008).

When a person perform compatible behaviors with his social group norms, he "achieves membership and the social support that such membership affords as well as possible goal attainment which can occur only through group action or group membership." (Vathanophas et al., 2008). So, a user could belief that usage of a system may improve job performance ("perceived usefulness") indirectly as a result of image improvement.

This "image" influence is included and tested by TAM2 through the "image" influence on "perceived usefulness".(Venkatesh & Davis, 2000)

In this study, "Image" identified by measuring employees' perception that using MoEHE Eservices will enhance his image between colleagues who are important to him.

## Section II

### 2.9 Palestinian Ministry of Education Eservices

#### 2.9.1 Ministry of Education and Higher Education (MoEHE)

The Ministry of Education and Higher Education founded after the Establishment of the Palestinian National Authority to manage the education in Palestine in 1994. In 1996 the management of Higher Education was entrusted to a new ministry known as the Ministry of Higher Education and Scientific Research. In the Ministerial reshuffle of the Palestinian government in 2002 has been re-integration of the two ministries in one ministry named the Ministry of Education and Higher Education.

The Ministry of Education is the official authority which is responsible for the education process in the Palestinian local community in all its grades: Kindergarten, Basic Education, Governmental Universities, Vocational schools and illiteracy. It is also responsible for monitoring private schools, private Universities and other educational organizations which are directed by other agencies like UNRWA.

The Ministry is responsible for supervising and developing the Palestinian education in various stages in the sectors of public education and higher education. It seeks to provide access opportunities to all of they are in school age, as well as improve the quality of teaching and learning to upgrade it in line with the global development. As well as the development of manpower in the education sector, in order to prepare the qualified Palestinian citizen that is capable of carrying out its duties efficiently and effectively.

The Ministry of Education and higher education, since taking the leadership of education in Palestine ,doing it best for the advancement of the educational process, and has made great efforts in this area despite difficult political circumstances, and rehabilitate the destruction left behind by the Israeli occupation.

The Ministry of Education and higher education created development plans and implemented many vital projects and activities with coordination and cooperation with many donors because of the lack of financial resources.

When we are talking about the management of about 1.1 million students and more than 50 thousand teachers, and supervision of the nearly two thousand schools and dozens of universities and colleges, it is difficult to manage these huge numbers efficiently by legacy methods, wherefore the Ministry embark on a major project represents the start of the adaptation of Information Technology to facilitate the management of educational processes, administrative processes and communication between various managerial levels and the schools staff. The project started with support of UNICEF to originate the MoEHE Eservices. This ERP system includes several software packages that support many functional areas in the Ministry head quarter, Educational directorates and schools (MoEHE, 2016).

### 2.9.2 Ministry's Vision

The creation of a Palestinian person which is proud of his religion, nationality and his Arabic and Islamic culture, that can contribute to the renaissance of society, seeks knowledge and creativity, interacts positively with the scientific and technological development requirements, is able to compete in the scientific and practical fields and is open to the cultures of regional and global markets. The citizen who is able to build a society based on gender equality and uphold human values and religious tolerance, and the advancement of the education system, which is characterized by: ease of enrolment, and the diversity of its programs, flexibility, efficiency, effectiveness, sustainability, responsiveness to local needs, and quality. (MoEHE, 2016)

### 2.9.3 MoEHE Eservice

MoEHE Eservices is an ERP system that was planned by MoEHE in 2009 and implemented later with supporting of UNICEF, it contains a suite of integrated applications that the Ministry uses to collect, store and manage data form several departments, educational directorates and schools. These applications make the system shares data across various departments and facilitate information flow between Ministry, educational directorates and schools.

#### 2.9.3.1 MoEHE Eservices applications

MoEHE Eservices contains several software packages that support the managerial and educational process in the ministry, the seven educational directorates and the 392 schools in the Gaza strip. Here are some of these software packages with a brief description (Bader, 2017):

*1- School Management Information System (SMIS):*

SMIS is a web-based school management information system that contains comprehensive, valid, reliable, and up-to-date schools' and students' data. It facilitates various managerial and educational processes at the 392 schools.

*2- Human Resources Management System:*

Human Resources Management System that combines number of human resource processes to ensure the easy management of more the 16000 MoEHE employees and their data. Human Resources Software is used by HR department to facilitate many necessary HR functions, such as storing employee data, recruitment processes,

vacations and keeping track of attendance records. It ensures everyday Human Resources processes and data are manageable and easy to access.

### 3- Exams Management System:

This system used by the directorate of exams to facilitate various processes related to central exams arrangement, the secondary stage (Tawjihi) exams arrangement and workers bonuses for additional work hours.

### 4- Educational Planning System:

It is a software package that used by Educational Planning directorate to facilitate planning of schools needs of educational staff , schools buildings, classrooms, educational furniture and other schools facilities . It contains up-to-date schools' and students' data which is integrated with SMIS and other software packages. This data with the sophisticated reporting tools makes it easy to plan various educational needs to ensure success of the educational process and improving the quality of its outcomes.

### 5- Supplies and Stores Management system:

This software package is used by the directorate of supplies to follow up and register supplies in all the buildings supervised by the ministry and monitor inventory in the ministry's and educational directorate's stores. It also used in need assessment of the furniture, devices and schools equipment.

### 6- Training management system:

It is a web-based software package that is used in planning and managing ministry's staff capacity building programs.  It used to plan, implement and follow up training courses according to staff training needs. It also integrated with the HR management system, since it stores training data to the employees' profiles.

### 7- Financial Management System:

This system is used by the directorate of financial affairs to Support the automation and integration of ministry's financial functions including budget formulation and execution, procurement, accounting, and reporting.

# Chapter 3
# Previous Studies

# Chapter 3

## Previous Studies

### 3.1 Arabic Studies

1- **Task-Technology Fit of MIS and its Impact on MIS User Acceptance and Satisfaction at UNRWA Relief and Social Services Area Offices – Gaza (Al-Gharbawi, 2016)**

The study aimed to investigate what determines acceptance of adverse event reporting systems by healthcare professionals using an integrated model of TAM with trust and management support variables. This study presents an extended technology acceptance model that integrates variables trust and management support into the model. The proposed model was empirically tested using data collected from a survey in the hospital environment. The structural equation modeling (SEM) technique was used for data analysis.

The research results indicated that perceived usefulness, perceived ease of use, subjective norm, and trust had a significant effect on a professional's intention to use an adverse event reporting system. Also, perceived ease of use and subjective norm also had a direct effect on perceived usefulness and trust, respectively. In addition, management support had a direct effect on perceived usefulness, perceived ease of use, and subjective norm.

The research recommended understanding the factors contributing to behavioral intent to be used in system development to predict reporting systems acceptance.

Also, reporting should feel comfortable and assured to be free of negative consequences. Finally, managers should support and motivate reporting publicly.

2- **The Pilot Test Study of Relationship Between Management Information Systems Success Factors and Organizational Performance at Sabafon Company in Yemen (Al-Mamary, Shamsuddin, & Abdul Hamid, 2015)**

This study aimed to investigate the relations among technological factors (system quality, information quality, and service quality), organizational factors (top management support, and user training), and people factors (computer self-efficacy, and user experience) with organizational performance, focusing on people who are always associated with MIS in their work." The study conducted at Sabafon Company in Yemen. The population is the MIS end users at Sabafon Company and the sample consisted of 104 questionnaire respondents. A

questionnaire that sent to Sabafon was used to collect Company's data. Pearson correlation using SPSS used to analyze data.

Results of research showed a positive correlation between the independent factor with "system quality", "information quality", "service quality", "top management support", "user training", "computer self-efficacy", and "user experience" with "organizational performance" at the studied Company.

The study recommended that managers must take care of these factors because of their impact on the organization's performance.

3- **Measuring Intentions among Employees toward the Use of a Balanced Scorecard and Information System: A Conceptual Approach Using the Theory of Planned Behavior and the Technology Acceptance Model (Al Jardali et al., 2015)**

This study aimed to design a theoretical model for later studies that try to examine and improve the performance of any public organization. it combined the TPB with the TAM. The study conducted in Lebanon and used the TAM to predict the Lebanese university employees' intentions toward using and implementing an information system and a balanced scorecard.

The study is based on multi-methodology qualitative data approach. At the beginning, it used participants observing methodology to observe employees' behaviors and administration performance. After that, it used TAM questionnaire in measuring non-administrative employees' usage intentions toward Information system. Then, measuring management intentions using semi-structured interviews conducted with managers at all levels top, middle and first line managers.

The study recommended to be applied in the future on empirical studies to help extending its theory using empirical outcomes and to adjust it.

4- **Factors Affecting Successful Adoption of Management Information Systems in Organizations towards Enhancing Organizational Performance. (Al-Mamary, Shamsuddin, & Aziati, 2014)**

This study aimed to design a theoretical model used to examine the technology, organization and user factors that may influence Management information system implementation in organization focusing on the factors leading to success implementation, and to identify influence of Management information systems

on organizational performance. The study examined empirically the impact of "system quality", "information quality", "service quality", "top management support", "End-user training", "technology self-efficacy", and "user experience" on "perceived usefulness" and "user satisfaction" impact on organizational performance. Study population consisted of the employees of telecommunications companies in Yemen.

The study results showed that the main factors that impede the successful adoption of Management information systems in telecommunications companies were "system quality", "information quality", "service quality", "top management support", "end user training", "technology self-efficacy", and "user experience". The study recommended organizations should try understanding the factors that influence success of Management information systems adoptions to enhance the organization performance.

5- **The Impact of Information Systems on User Performance: An Exploratory Study (Ali & Younes, 2013)**

This study was developed to answer the question related to the impact of information systems on user performance in Tunisian companies. The study proposed a model combining the Task Technology Fit (TTF), the Technology Acceptance Model (TAM) and Delone & McLean model to evaluate the performance of users in the Tunisian organizations. The model was tested using survey data collected from 314 users of the information system. AMOS structural equation 18 were used to test the relationships between variables in the model.

Also, the exploratory analysis was conducted in SPSS 17. The research results show that TTF, system quality and information quality directly influences the performance of users and indirectly through perceived usefulness and perceived ease of use. In addition, the TTF and the system quality play an important role in improving the performance quality and increase the volume of users work. This study provided further evidence of the appropriateness of extending the models of TTF, TAM and Delone & McLean as a useful means to provide an overview on the most important aspects of the IS impact on user performance.

The research recommended researchers and practitioners in IS to maximize IS impacts by improving training and organizational support. Also, careful consideration of user needs and requirements of working in a particular industry will help IS designers to design and implement information systems in the light of the diversity of suppliers, designers, functionality of IS and industries. In addition, the study recommended the future research to improve some measurement scales of variables, including scales measuring perceived usefulness and perceived ease of use.

## 6- An empirical investigation of information systems success: an analysis of the factors affecting banking information systems success in Egypt (Hussein, 2010)

This study aimed to propose a model which investigates the success of information systems in the banking industry in order to help bank managers to evaluate the success of their IS, to be able to develop these systems and to improve the performance of bank managers and employees. The population of study was the Egyptian banks managers. The sample consisted of 257 bank manager.

The research methodology was quantitative. It started by conducting interviews with Banking Information System (BIS) practitioners and professionals to shape and refine the research model. Then, questionnaire survey was employed to collect data from bank managers in Egyptian banks. Structural Equation Modelling (SEM) using Partial Least Square (PLS) was used to test the research model.

The results of this study showed different findings in each research mode of the three models which are classified based on age groups. For the young age group of bank managers, results showed that system quality, age and length of system use influence user satisfaction. Also, for the young age group, findings did not support the relationship between information quality, service quality and user satisfaction. Also, the level of training had a direct relationship with system quality, service quality and user satisfaction. For the middle age group of managers, results indicated that information quality, service quality, age and length of system use had an effect on user satisfaction. Also, findings revealed that level of training had a direct relationship with system, information and service quality. Regarding the older age group, information quality, service quality, user involvement, top management support, age and length of system use had a direct effect on user satisfaction.

The research recommended bank management to benefit from the mutual relationship of User satisfaction with individual impacts by developing banking decision systems, using expert systems and computer networks for electronic information exchange, to increase BIS satisfaction and consequently increase managers' job performance.

## 7- Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT (Al-Gahtani, Hubona, & Wang, 2007)

This study aimed to test the unified theory of acceptance and use of technology (UTAUT) model in the Saudi Arabia to test if the model valid in the Arabian

culture. This model used recently to measure the user acceptance of IT. The model has not been validated in non-Western cultures before this study. The population of study is the knowledge workers using desktop computer applications on a voluntary basis in the major companies in Saudi Arabia the sample consisted of 722 knowledge workers responded to the questionnaire.

The data collected from 722 knowledge workers was analyzed using PLS-Graph, a PLS structural equation modeling tool assesses the psychometric properties of the measurement model, and estimates the parameters of the structural model examined the relative power of a modified version of UTAUT in determining 'intention to use' and 'usage behavior'.

The study results showed that the model explained 39.1% of intention to use variance, and 42.1% of usage variance. In addition, drawing on the theory of cultural dimensions, the researchers hypothesized and tested the similarities and differences between the North American and Saudi validations of UTAUT in terms of cultural differences that affected the organizational acceptance of IT in the two societies.

## 3.2 Foreign Studies

### 1- Empirical Examination of User Acceptance of Enterprise Resource Planning Systems in the United States(Oldacre, 2016)

This empirical study aimed to examine "user acceptance" of ERP systems in the United States of America. The study conducted on number of organizations at United States. The population of the study is the American organizations' employees who have been using ERP systems as end users to perform their job tasks.

The study used quantitative cross-sectional survey to examine the factors that affect user acceptance using TAM (F. D. Davis, 1989). The collected data analyzed using linear multiple regression with "perceived ease of use" (PEOU) and "perceived usefulness" (PU) as the independent variables and user acceptance of ERP systems as dependent variable.

The results of this study showed that there are a positive relationship between "perceived usefulness" (PU) and "end user acceptance" of ERP systems in the United States which were consistent with the results of other previous studies in other cultures and geographical areas. This study supported the theoretical hypothesizes of the TAM (F. D. Davis, 1989) in the American organizations context.

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The study recommended that managers should adjust their management practices and implement training programs to improve the "ease of use" of the ERP systems which enhance "user acceptance". It also recommended emphasizing on improving functionality of the ERP systems which may improve the work efficiency and productivity.

**2- A structural model of technology acceptance (Erasmus et al., 2015)**

This empirical study aimed to examine the "technology acceptance model" within a South African SAP Enterprise Resource Planning user environment. The author stated that this study is the first that evaluate the technology acceptance model TAM (F. D. Davis, 1989) in the South African context.

The study used cross-sectional survey design with 23-item TAM questionnaire and the collected data analyzed using the SPSS and the AMOS software programs Using structural equation modelling (SEM) methods as implemented by AMOS to evaluate the relations between the TAM variables: perceived ease of use (PEOU), perceived usefulness (PU), attitude towards using, behavioral intention to use and actual system use.

The results of this study showed that there is significant impact of perceived usefulness of the information system to attitudes towards and behavioral intentions to use it. Furthermore, behavioral intention to use the system also predicted actual use. Attitudes toward system and behavioral intentions to use are indirectly affected by Perceived ease of use via perceived usefulness of the information system. This study supported the theoretical hypothesizes of the technology acceptance model TAM (F. D. Davis, 1989) in the South African context. The study recommended many recommendations. The first recommendation is to build user confidence by proving the ease of use of the new information system. Secondly, it is necessary to ensure usefulness and future added value to the end user's job tasks by employing the new information system. Thirdly, through relevant education, training and guidance initiatives, on-going user support which may help enhancing perceived ease and users motivation to use the system.

**3- Exploring the adoption of a virtual reality simulation The role of perceived ease of use, perceived usefulness and personal innovativeness (Fagan, Kilmon, & Pandey, 2012)**

This study aimed to explore students' perceptions toward the virtual reality simulation that enable nursing students to learn how to use a medical emergency crash cart. The study conducted the Southwestern University in the USA. The

population of the study is undergraduate nursing students at the Southwestern University. The study sample consisted of 158 undergraduate nursing students at the Southwestern University.

This study developed a modified research model based upon the technology acceptance model TAM (F. D. Davis, 1989).

The questionnaire items were constructed from previous studies .The collected data analyzed using partial least squares (PLS), a structural equation model (SEM) technique. Compared with other (SEM) techniques, PLS is a non-parametric technique and makes no assumptions regarding the distribution of variables.

The results of this study showed that the study's research model explained about 65 percent of the variance in intention to use the virtual reality simulation. It found that Perceived ease of use and Perceived usefulness of the virtual reality crash cart simulation had significant positive influence on behavioral intention to use the simulation. Also it found that Perceived ease of use had a significant positive relationship with perceived usefulness. The study confirmed the value of the technology acceptance model TAM as a mean of assessing users' perceptions of an information technology and their behavioral intentions to use it.

4- **Measuring Dhaka University students' perceptions of ease-of-use and their satisfaction with University Library's online public access catalogue (Islam & Zabed Ahmed, 2011)**

This empirical study aimed to examine Dhaka University student's perceptions of ease of use and their satisfaction toward University Library's online public access catalogue DUL OPAC to suggest some guidelines for the design of OPAC interface. It conducted in Dhaka University Bangladesh. The population of the study is the Dhaka University students. The sample consisted of 274 university students.

A survey questionnaire was developed and used to collect data on students' demographics, online catalogue use and their perceptions about OPAC. The collected data analyzed using Mann-Whitney and Kruskal-Wallis tests.

The results showed that most students are satisfied with the DUL OPAC. The study recommended that the DUL should promote the awareness of and use of its OPAC by providing comprehensive orientation and information literacy programs to students and development of a user-friendly web site with enhanced accessibility. The study also recommended conducting a formal task-based usability testing and adopting a user-centered design can ensure the usability of the OPAC in the future, also it suggested some guidelines for designing interfaces for online catalogues.

**5- TAM2-based Study of Website User Behavior—Using Web 2.0 Websites as an Example (MEI-YING WU, 2011)**

This empirical study aimed to examine relationships between constructs associated with Web 2.0 website user behavior by adapting Technology Acceptance Model 2 (TAM2). The study conducted at Chung-Hua University in Taiwan. The population of study was Web 2.0 websites users. The sample consisted of 400 Web 2.0 users. Data are collected through a TAM2 questionnaire survey. Hypotheses are proposed and validated through Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) in order to understand user acceptance of Web 2.0 websites.

Results showed that most of the hypotheses proposed on the basis of TAM2 are empirically supported. It can be inferred that the current Web 2.0 websites are generally accepted by users. Moreover, from the research results, users' intentions and behavior associated with use of Web 2.0 websites can be understood; hence, the results serve as a reference for those planning to start a business on Web 2.0 websites. It is believed that Web 2.0 websites will continue to be the source of new business opportunities on the web.

**6- Reducing online privacy risk to facilitate e-service adoption: the influence of perceived ease of use and corporate credibility (Featherman, Miyazaki, & Sprott, 2010)**

This study aimed to examine ways to reduce privacy risk and its effects so that adoption of e-services can be enhanced. The study used the technology acceptance model TAM (F. D. Davis, 1989) , combined with a multi-faceted conceptualization of privacy risk to moves the examination of privacy risk to a higher level, particularly in light of the examination of the additional factors of perceived ease of use and corporate credibility.

The population of the study was the consumers that form a viable target market for an online bill payment service in the USA. The sample consisted of 434 respondents are presented with a task of experiencing the e-service and expressing their attitudes and intentions toward it. Structural equation modeling (SEM) is used to analyze the collected data.

The results of the study showed that consumer beliefs that the e-service will be easy to use and that the e-service provider is credible and capable reduce privacy risk and its effects, more likely to enhance adaption.

The study recommended that e-services providers must focus on enhancing perceived corporate credibility regarding the use of sensitive consumer

information in order to reduce perceived privacy risk and/or reduce its impact on usage intention.

**7- Technology acceptance toward e-government initiative in Royal Thai Navy(Vathanophas et al., 2008)**

This study aimed to investigate the technology acceptance by naval officer in the Naval Department toward the e-government initiative in the Royal Thai Navy. It used TAM as a base theory to determine the effects of external factors toward the readiness of the e-government initiative.

The study used two research methodologies for gathering data: The TAM questionnaire and interview. The TAM questionnaire was used to measure naval finance officers' perceptions on the internet and to find the relationship between the 12 external factors (independent variables) and perceived usefulness (PU) & perceived ease of use (PEU) (dependent variables).

The questionnaire for this study was designed by using closed-end questions. To collect data, 150 TAM questionnaires were distributed to naval finance officers who work at the Naval Finance Department of the Royal Thai Navy. The data calculated by using a Stepwise Linear Regression model from the SPSS program.

The interview was used to explore internet use acceptance in a public organization, and to discover how government officers at one public organization felt about the e-government initiative and internet usage within their organization.

The study analysis shows that the external factors influencing naval officers' perceptions on internet use acceptance were: prior experience, job relevance, commitment, trust, and autonomy.

However, training and infrastructure problems are other important factors that can also lead to the acceptance of internet use.

**8- Testing the technology acceptance model for evaluating healthcare professionals' intention to use an adverse event reporting system (J.-H. Wu, Shen, Lin, Greenes, & Bates, 2008)**

The study aimed to investigate what determines acceptance of adverse event reporting systems by healthcare professionals using an integrated model of TAM with trust and management support variables. This study presents an extended technology acceptance model that integrates variables trust and management support into the model. The proposed model was empirically tested using data

collected from a survey in the hospital environment. The structural equation modeling (SEM) technique was used for data analysis.

The research results indicated that perceived usefulness, perceived ease of use, subjective norm, and trust had a significant effect on a professional's intention to use an adverse event reporting system. Also, perceived ease of use and subjective norm also had a direct effect on perceived usefulness and trust, respectively. In addition, management support had a direct effect on perceived usefulness, perceived ease of use, and subjective norm.

The research recommended understanding the factors contributing to behavioral intent to be used in system development to predict reporting systems acceptance.

Also, reporting should feel comfortable and assured to be free of negative consequences. Finally, managers should support and motivate reporting publicly.

**9- Technology acceptance: a meta-analysis of the TAM (Part 1) (Yousafzai et al., 2007)**

This meta-analysis study investigated the Technology Acceptance Model, and it outlined a total of 145 studies that had been published regarding the model (F. D. Davis, 1989). The study objective was to clarify the previous achievements in this field and to draw conclusions from previous literature that can help in better implementation of information systems. It also aimed at determining the limitations of these studies to provide starting points and new ideas for future research on this topic. This study was followed by another study that was conducted in the same year.

**10- Technology acceptance: a meta-analysis of the TAM" (Part2)(Yousafzai et al., 2007)**

This is the second meta-analysis study that was conducted to describe the published literature concerned with the technology acceptance. This study aimed at identifying positive findings that can add to effective management behaviors. It also sought to determine limitations in previous studies in order to provide suitable directions for future research in the field.

In addition, the study aimed at detecting any effects of the applied methodologies on the findings of the meta-analysis. It applied Hedges and Olkin's procedures for the meta-analysis and homogeneity Q-values, analogue to ANOVA and weighted regression method for the moderator-analysis.

The methodology consists of meta-analysis following Hedges and Olkin's procedures, moderator-analysis using homogeneity Q-values, analogue to ANOVA and weighted regression method.

The study revealed that most previous experimental studies concentrated "modeling intention" due its relevance to the users' conception of their behavior. However, they overlooked the attitudinal aspect. In addition, the meta-analysis sought to test the relative significance of users' perception of the system's Ease of Use and Usefulness. It showed that the users' position on using the system was more affected by the former than the latter.

### 11- A Meta-Analysis of the Technology Acceptance Model (King & He, 2006)

The researchers conducted Meta-Analysis of the "technology acceptance model" form 88 published studies about the model. The results showed that the model is valid and reliable in general. The study found that the influence of "perceived ease of use" and "perceived usefulness" is strongly valid and these two variables can be used for in different contexts. It also found that there are strong correlations between models' variables, with some variation, which may require some intermediate variables. The "perceived usefulness" effect on the "intention to use" is strong and essential compared to the impact of the "perceived ease of use". Researcher recommended conducting more tests and samples with larger sizes since the direct relationship between the "perceived ease of use" and "intention to use" are varied among previous studies.

### 12- The Technology Acceptance Model : A Meta-Analysis of Empirical Findings (Ma & Liu, 2004)

This study is a Meta-Analysis conducted on 26 published studies. The study aimed to get to the empirical evidence by analyzing the results of previous studies.

By analyzing the results of the 26 study the study found that there is a strong correlation between the "perceived usefulness" and "acceptance of technology", as well as between the "perceived usefulness" and "perceived ease of use". But the relationship between the "perceived ease of use" and "technology acceptance" is weak. The study concluded that the "perceived usefulness" is a critical factor in the adoption of information technology. The study recommended that the systems designers must focus on the features and benefits of the system to improve the degree of acceptance of the user and also do not ignore the relationship between the "perceived usefulness" and "perceived ease of use", "so they have to focus on

ease of use of the system as it has a strong impact on the user's perception of the usefulness of system.

## 3.3 General Commentary on Reviewed Studies

Many studies addressed the field of Information systems acceptance and success assessment. Some of the studies aimed to test previously studied models such as TAM and UTAUT models through applying these models in new situations. Other studies proposed some modifications on these models to present new interpretation for the characteristics of successful Information Systems. Based on reviewing the previous studies, some notes can be highlighted in this section.

### 3.3.1 Environment of the Study

The current study agrees with the most of the previous studies, in that they addressed similar environments. These studies targeted the work environment of employees, who use management information systems in their work, in various organizations. For example, the study of (Oldacre, 2016) targeted the work environment of employees who work for the United States organizations. Also, the study of (Erasmus et al., 2015) was applied on the South African SAP Enterprise Resource Planning user environment . Also, the study of (Vathanophas et al., 2008) was applied on the work environment of government employees in the in Royal Thai Navy. The study of (Hussein, 2010)  studied banking information systems in Egypt, and the study of (J.-H. Wu et al., 2008)  was applied on the employees who worked in a hospital environment. In addition, the following studies were applied in similar environments: (Al-Mamary et al., 2015), (Al Jardali et al., 2015), (Al-Gahtani et al., 2007).

Some of these previous studies had addressed environments which were different of the environment that the current study addresses. For example, the study of Abu-Dalbouh (2013) was applied on students at Al-Qaseem University in Saudi Arabia to explore the users acceptance of mobile technology application within healthcare industry. Also, the study of (Fagan et al., 2012)  was applied on nursing students to explore their  perceptions toward using virtual reality simulation in learning  and training. The study of (Islam & Zabed Ahmed, 2011)  targeted Dhaka University student's to explore their perceptions toward University Library's online public access catalogue. In addition, (MEI-YING WU, 2011) study conducted at Chung-Hua University in Taiwan to explore Web 2.0 website user behavior by adapting Technology Acceptance Model 2 (TAM2). In addition, the following studies were applied in different environments; (Featherman et al., 2010) and (J.-H. Wu et al., 2008) "

### 3.3.2 Models and Variables

The current study agrees with most of the previous studies regarding using Technology Acceptance Model to study information systems user acceptance .

For example, the study of (Vathanophas et al., 2008) is similar to the current study, as it proposed a model testing the effect of several external factors on the perceived Usefulness and perceived Ease of Use in the original TAM model to evaluate the impact of these factors on users' intention to use information system. Also, the study of (MEI-YING WU, 2011) used TAM2 model to examine the impact of the same external factors used by the researcher on perceived Usefulness and users' intention to use information system.

Other studies used the unified technology acceptance model (UTAUT) to evaluate users acceptance, e.g.; (Al-Gahtani et al., 2007) study examined the relative power of a modified version of UTAUT in determining "intention to use" and "usage behavior".

### 3.3.3 Methodology and Study Tools

Most of previous studies had adopted methodologies which are similar to the methodology which has been adopted by the current study. The current study agrees with most of previous studies in using the questionnaire as a research tool to collect primary data.

### 3.3.4 Analysis Methods

The current study agrees with most of previous studies in using the Structured Equation Modelling (SEM) techniques for data analysis, but using various software programs. For example, Partial Least Squares (PLS) was used for model analysis in the studies of (Hussein, 2010), (J.-H. Wu et al., 2008), (Featherman et al., 2010), (MEI-YING WU, 2011), (Erasmus et al., 2015), (Fagan et al., 2012) and (Al-Gahtani et al., 2007).

The current study disagrees with some of previous studies because the Structured Equation Modelling (SEM) techniques were not used for data analysis. For example, in the studies of (Al-Mamary et al., 2015), (Yousafzai et al., 2007), (Vathanophas et al., 2008), (Islam & Zabed Ahmed, 2011) and (Al-Mamary et al., 2015).

### 3.3.5 Distinguishing Aspects of the Current Study

1. This is the first study that addressed the Management Information Systems User acceptance in MoEHE in Gaza strip using TAM.

2. The current study added external factors to evaluate their impact on users' perceptions, user acceptance and the IS success.
3. In addition, a new analytical approach adopted for data analysis, via using Partial Least Squares Structural Equation Modeling (PLS-SEM), using SmartPLS software.

# Chapter 4
# Research Design and Methodology

# Chapter 4

# Research Design and Methodology

## 4.1 Introduction

This chapter describes the methodology of the research adopted to accomplish the objectives of the research. The term methodology is used to establish a step-by-step procedure for reaching the intended research results.

The purpose of any research is to search for answers to questions through the application of scientific procedures. The main purpose of this research is to study the impact of some external factors on the users' perceptions (Perceived ease of use & perceived usefulness) about Eservices in the Ministry of Education – Gaza, and the impact on the users' acceptance and usage of the system.

This chapter divided into the following sections: research methodology, research population, response rate, instrument and measurement scales, questionnaire reliability using Cronbach Alpha, questionnaire validity using content validity, internal consistency, test of normal distribution and statistical techniques used in the study.

## 4.2 Methodology

This research used the descriptive analytical methodology which study the phenomenon as it is, describe it accurately and clarifying its characteristics through collecting, analyzing and explaining data.

The usage of this methodology aims to explore the impact of some external factors on the users' perceptions (Perceived ease of use & perceived usefulness) about Eservices in the Ministry of Education – Gaza, and the impact on the users' acceptance and usage of the system.

The descriptive analytical methodology characteristics is not only collecting and organizing data that is related to a specific phenomenon, but also aims to reach conclusions that contribute in understanding reality throughout analyzing and explaining the studied phenomenon. Furthermore, reaches meaningful generalizations that enable the study to enrich the knowledge about that phenomenon, and contributes in developing the fact of an intentional phenomenon, standing on the most important advantages and disadvantages, trying to improve the disadvantages and developing the advantages that are related to the phenomenon under study (Naoum, 2012).

## 4.3 Research Population

The research population consists of all the MoEHE users of Eservice in the Ministry Of Education, The seven Educational Directorates and 392 governmental schools in the Gaza Strip (14575 employees). To complete the research process the researcher got the required permissions from the specialized department to facilitate collecting data and conducted a comprehensive survey.

## 4.4 Study sample

The researcher used comprehensive survey method to gather data from about 14575 employees using the system and 612 questionnaires were filled in. According to sampling, theory the suitable sample size from this population is 374 (according to Sample calculator in (surveysystem, 2017)) + 26 (expected loss in questionnaire)= 400, with confidence level equal to 95% and Confidence Interval equal to 5.

## 4.5 Instrument and Measurement

There are two types of research approaches: quantitative approach and qualitative approach. Quantitative approaches seek to gather factual data and to study relationships between facts and how such facts and relationships accord with theories and the findings of any research executed previously (Dulaimi, Liu, Chiu, & Fellows, 2007). The researcher used TAM2 standard questionnaire shown in (Appendix A). The TAM2 questionnaire developed by (Venkatesh & Davis, 2000). The questionnaire was designed in Arabic language (Appendix B), and distributed electronically using MoEHE Official Survey System.

The researcher used two types of data sources. The first type secondary sources, which are the previous studies and books that are related to the research subjects. The second type is the primary sources which are the data that the researcher collected through the questionnaire that analyzed by using SPSS and SmartPLS.

By focusing on eight constructs, the research questionnaire consists of two parts as follows:

 **Part (1)**: Consists of the demographic and personal information of the respondents

(Gender, Age, Marital status, Educational background, Years of experience, Respondent job, and work place).

**Part (2)**: Consists of (27) items distributed on eight constructs according to the TAM2 Measurement Scales in the TAM2 standard questionnaire.

The researcher used TAM2 standard questionnaire shown in (Appendix A). The questionnaire developed by (Venkatesh & Davis, 2000). The questions translated and clarified by researcher to simplify understanding by respondents. After supervisor review of a questionnaire, the researcher rearranged and reformulated some paragraphs according to the modifications made by the supervisor to settle the questionnaire in final form, as in (Appendix B). Since the questionnaire is standardized (on the shelf) questionnaire, it is already arbitrated and don't need further arbitration.

The questionnaire included:

1- The title of the research and the researcher name.
2- A brief description of the research objective and it's important for the ministry to motivate participation.
3- Demographic data, ex: age – experience - job name – qualification- etc.
4- Each factor measured by a paragraph consists of 3-5 items to cover all factor contextual terms with a brief factor description.
5- All questionnaire items will be measured by 5-point liker-type scale, where 1=completely disagree, 2=disagree, 3 = neither agree nor disagree (neutral), 4= agree, 5= completely agree.

All the items will be treated according to this criterion whatever the answers were.

The level of agreement will be determined for each item and each dimension according to five levels based on Likert scale, the following table shows that:

**Table (4.1):** Level of agreement measurement scale

| Level of agreement | Very low | Low | Medium | High | Very high |
|---|---|---|---|---|---|
| **Mean** | 1-1.80 | 1.81-2.60 | 2.61-3.40 | 3.41-4.20 | 4.21-5.0 |
| **Relative Mean** | 20%-36% | 36%-52% | 52%-68% | 68%-84% | 84%-100% |

## 4.6 Pilot study:

It is a type of samples used by any researcher makes a field study, especially, the new researcher resorted when his knowledge about the subject was very simple, which increase his knowledge to dive in his study and expand in all its aspects. The exploratory sample represents a starting point of scientific research in both

theoretical and practical sides, and also represents the first step of field study. In addition, it serves as a reassurance to the researcher and enhancing of continuing his study.

Accordingly, the researcher distributed a random exploratory sample contain of 40 questionnaires to Eservices end users in the MoEHE in Gaza.

## 4.7 Response Rates

The questionnaire designed using *MoEHE's official surveys system* and distributed to the MoEHE employees through Ministry's official Email after taking official permissions (Appendix B, C). This increased the response rate and the commitment of the employees toward the study. The online questionnaire concern more accurate and save time and effort in data entrance. So, 612 questionnaires were filled in which was enough according to sample size calculator (surveysystem, 2017). All the recovered questionnaires were valid and suitable to analyze.

## 4.8 Reliability

The reliability of an instrument is the degree of consistency, which measures the attribute that supposed to be measuring (Polit & Hungler, 1989). On the other hand, the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. Reliability means the degree of consistency between two measures of the same thing. (W. Mehrens & Lehman, 1991)

The measures of how stable, dependable, trustworthy, and consistent a test is in measuring the same thing each time (Worthen, Borg, & White, 1993) and validity can be explained by the question "does the test measure what it purports to measure?". It is the extent to which certain inferences can be made from test scores or other measurement (W. A. Mehrens & Lehmann, 1987). And the degree to which they accomplish the purpose for which they are being used (Worthen et al., 1993).

### 4.8.1 Cronbach Alpha

Cronbach's Alpha (George & Mallery, 2003) is designed as a measure of internal consistency, that is, do all items within the instrument measure the same thing. Cronbach's Alpha is used here to measure the reliability of the questionnaire for each dimension. The normal range of Cronbach's Alpha value is between (0-1). The closer the Alpha is to one, the greater the internal consistency of items in the instrument being assumed. Table (4.2) shows the values of Cronbach's Alpha for the dimensions of the research.

**Table (4.2):** Cronbach's Alpha coefficient for reliability

| Constructs | N of Items | Cronbach's Alpha |
|---|---|---|
| Perceived Usefulness (PU) | 4 | 0.915 |
| Perceived Ease of Use (PEOU) | 4 | 0.827 |
| Subjective Norm (SN) | 2 | 0.841 |
| Image  (PU) | 4 | 0.845 |
| Job Relevance (JR) | 3 | 0.818 |
| Output Quality (OQ) | 3 | 0.860 |
| Result Demonstrability (RD) | 4 | 0.878 |
| Intention to Use (IU) | 3 | 0.902 |

Cronbach's Alpha value ranged between (**0.818**) for "**Job Relevance" (JR)** and (**0.915**) for **"Perceived Usefulness" (PU)**. In addition, for the entire questionnaire, the Cronbach's Alpha equals (**0.945**) for all constructs. The questionnaire is considered reliable, and ready for distribution for the intended sample.

The researcher noticed that the instrument has high Cronbach's Alpha for all constructs, this indicates the high reliability since it is a standardized (on the shelf) questionnaire.

## 4.9 Validity

Validity refers to the degree to which an instrument measures what it is supposed to measure (Polit & Hungler, 1989). Validity has a number of different aspects and assessment approaches. Statistical validity is used to evaluate instrument validity, which includes criterion-related validity and construct validity.

Validity can be explained as the ability to measure what you actually intended to measure (Eriksson and Widersheim-Paul, 1999). Validity is about data and the methods used and how the data can be considered exact, true and accurate (Denscombe, 2003).

There are many methods for measuring validity; the researcher used content validity and internal consistency.

### 4.9.1   Content Validity

The questionnaire is a standardized TAM2 questionnaire. It was formulated and tested by (Venkatesh & Davis, 2000). The researcher has translated it and reformulated some parts to become more understandable according to supervisor's advices and suggestions.

### 4.9.2   Internal consistency

The internal validity of the questionnaire is the first statistical test that used to test the validity of the questionnaire. Internal validity measured through the correlation coefficients between each item in the construct and its total.

**4.9.2.1 Internal consistency for "Perceived Usefulness" (PU)**

Table (4.3) shows that all the correlation coefficients for the items of **"Perceived Usefulness" (PU)** are significant at 0.05 level. The correlation coefficients ranged between (0.831) for "I find the Eservices to be useful in my job" and (0.917) for "Using the Eservices enhances my effectiveness in my job".

**Table (4.3):** Correlation coefficient of each paragraph of for "Perceived Usefulness"

| Items | correlation | P-Value |
|---|---|---|
| Using the system improves my performance in my job. | 0.907 | 0.000 |
| Using the system in my job increases my productivity. | 0.915 | 0.000 |
| Using the Eservices enhances my effectiveness in my job. | 0.917 | 0.000 |
| I find the Eservices to be useful in my job. | 0.831 | 0.000 |

### 4.9.2.2 Internal consistency for "Perceived Ease of Use" (PEOU)

Table (4.4) shows that all the correlation coefficients for the items of **"Perceived Ease of Use" (PEOU)** are significant at 0.05 level. The correlation coefficients ranged between (0.796) for "I find it easy to get the Eservices to do what I want it to do." and (0.837) for "I find the Eservices to be easy to use".

**Table (4.4):** Correlation coefficient of each paragraph of for "Perceived Ease of Use"

| Items | correlation | P-Value |
|---|---|---|
| My interaction with the Eservices is clear and understandable | 0.803 | .000 |
| Interacting with the Eservices does not require a lot of my mental effort | 0.818 | .000 |
| I find the system to be easy to use | 0.837 | .000 |
| I find it easy to get the Eservices to do what I want it to do | 0.796 | .000 |

### 4.9.2.3 Internal consistency for "Subjective Norm" (SN)

Table (4.5) shows that all the correlation coefficients for the items of **"Subjective Norm" (SN)** are significant at 0.05 level. The correlation coefficients ranged between (0.926) for "people who are important to me think that I should use the system" and (0.933) for "people who influence my behavior think that I should use the system".

**Table (4.5):** Correlation coefficient of each paragraph of for "Subjective Norm"

| Items | correlation | P-Value |
|---|---|---|
| People who influence my behavior think that I should use the Eservices | 0.933 | 0.000 |
| People who are important to me think that I should use the Eservices | 0.926 | 0.000 |

### 4.9.2.4 Internal consistency for "Image" (IM)

Table (4.6) shows that all the correlation coefficients for the items of **"Image" (IM)** are significant at 0.05 level. The correlation coefficients ranged between (0.763) for "having the system is a status symbol in my organization." and (0.853) for "people in my organization who use the system have a high profile".

**Table (4.6):** Correlation coefficient of each paragraph of for "Image"

| Items | correlation | P-Value |
|---|---|---|
| People in my organization who use the Eservices have more prestige than those who do not | 0.837 | 0.000 |
| People in my organization who use the Eservices have a high profile | 0.853 | 0.000 |
| Having the Eservices is a status symbol in my organization | 0.763 | 0.000 |
| My image will be enhanced in my organization when using Eservice | 0.852 | 0.000 |

### 4.9.2.5 Internal consistency for "Job Relevance" (JR)

Table (4.7) shows that all the correlation coefficients for the items of **"Job Relevance" (JR)** are significant at 0.05 level. The correlation coefficients ranged between (0.835) for "In my job, usage of the Eservices is important" and (0.880) for "In my job, usage of the Eservices is relevant".

**Table (4.7):** Correlation coefficient of each paragraph of for "Job Relevance"

| Items | Correlation | P-Value |
|---|---|---|
| In my job, usage of the Eservices is important. | 0.835 | 0.000 |
| In my job, usage of the Eservices is relevant. | 0.880 | 0.000 |
| In my job, the Eservices is designed to help me doing my tasks | 0.855 | 0.000 |

### 4.9.2.6 Internal consistency for "Output Quality" (OQ)

Table (4.8) shows that all the correlation coefficients for the items of **"Output Quality" (OQ)** are significant at 0.05 level. The correlation coefficients ranged from (0.877) for "I have no problem with the quality of the Eservices' output" and "the information I get through Eservices has high quality" to (0.898) for "The quality of the output I get from the Eservices is high".

**Table (4.8):** Correlation coefficient of each paragraph of for "Output Quality"

| Items | correlation | P-Value |
|---|---|---|
| The quality of the output I get from the Eservices is high | 0.898 | 0.000 |
| I have no problem with the quality of the Eservices' output | 0.877 | 0.000 |
| The information I get through Eservices has high quality | 0.877 | 0.000 |

### 4.9.2.7 Internal consistency for "Result Demonstrability" (RD)

Table (4.9) shows that all the correlation coefficients for the items of **"result demonstrability"** are significant at 0.05 level. The correlation coefficients ranged between (0.723) for "the results of using the eservices are apparent to me." and (0.765) for "I believe I could communicate to others the consequences of using the eservices".

**Table (4.9):** Correlation coefficient of each paragraph of for "Result Demonstrability"

| Items | correlation | P-Value |
|---|---|---|
| I have no difficulty telling others about the results of using the Eservices | 0.761 | 0.000 |
| I believe I could communicate to others the consequences of using the Eservices | 0.765 | 0.000 |
| The results of using the Eservices are apparent to me | 0.723 | 0.000 |
| I would have difficulty explaining why using the Eservices may or may not be beneficial | 0.765 | 0.000 |

### 4.9.2.1 Internal consistency for "Intention to Use" (IU)

Table (4.10) shows that all the correlation coefficients for the items of **"Intention to Use" (IU)** are significant at 0.05 level. The correlation coefficients ranged between (0.896) for "If I where volunteer to use Eservices I will use it" and (0.928) for "Given that I have access to the Eservices, I predict that I would use it".

**Table (4.10):** Correlation coefficient of each paragraph of for "Result Demonstrability"

| Items | correlation | P-Value |
|---|---|---|
| I would have difficulty explaining why using the Eservices may or may not be beneficial | 0.919 | 0.000 |

| | | |
|---|---|---|
| Given that I have access to the Eservices, I predict that I would use it. | 0.928 | 0.000 |
| If I where volunteer to use Eservices, I will use it | 0.896 | 0.000 |

## 4.10 Normality test

There are two types of statistical tests, the first is "Parametric tests" and the second one is "Non-Parametric tests". If the data is normal distributed, parametric tests are applicable. If not nonparametric tests are used. According to the Central Limit Theorem, if the sample size (n) is greater than (30) respondents, we can throw over the normal distribution condition (Rabee, 2007). Parametric statistics are used with Likert data, with small sample sizes (Geoff Norman, 2010). For this research, the researcher used the parametric tests.

## 4.11 Data coding and editing

The data collected using MoEHE's official surveys system which is an official survey system included in Eservice used to facilitate conducting studies in the Ministry. When the data was obtained via the electronic survey, the data was checked for missing values, inconsistencies, the range of each variable for out of range values and any other response errors automatically by the electronic system through filling questionnaires. Also, the system coded the data and exported it in Microsoft Excel sheet format and was ready to analysis. The Statistical Package for Social Science (SPSS) and SmartPLS v3.2.6 were used for quantitative data analysis. The coded data were rechecked visually for the detection of any possible data errors. Descriptive statistics were computed for all the variables for accuracy of inputs as follows: frequency counts were performed, the distribution of each variable was analyzed to detect irregular answers and cases with extreme values and the means and standard deviations were computed.

## 4.12 Statistical methods

The current study agrees with most of previous studies in using the Structured Equation Modelling (SEM) for data analysis. The researcher has used both descriptive and quantities data analysis methods, described personal information for the respondents using frequencies, percentages and charts, Estimated the reliability of the questionnaire using Cronbach Alpha, Spearman Brown Coefficient: Pearson Correlation Coefficient, identified to what extent the responses for items and the main constructs of the study using mean and showed how much variation or dispersion exists from the mean using Standard Deviation. To examine research

hypotheses and to answer research questions, the researcher has applied the following statistical methods:

1. Pearson Correlation and Average Variant Extracted (AVE) for Validity.
2. Cronbach's Coefficient Alpha and composite Reliability for Reliability.
3. One-sample T-test Analysis.
4. SEM-PLS Analysis:
   a. Measurement Model Evaluation.
   b. Structural Model Evaluation.

Furthermore, the researcher has used the following statistical tools:

1. IBM SPSS statistics 20.
2. SmartPLS v3.2.6.

## 4.13   Ethical Considerations

The information collected by this research may be personal and explore users perceptions that they may don't like to share with others. So this information has been treated securely and will not use except for the scientific research only. The researcher has got permission to start research from the planning department in the MoEHE before starting data collection and did not enforce any stakeholder to participate in the research. The subject and the purpose of the research have been described to participants clearly before interviews and in the questionnaire.

## 4.14   Bias

Bias can happen by some users that they may think that the information can be used in their performance appraisal. This type of bias can be eliminated by clarification that the information collected will be treated securely and used only for scientific research.

## 4.15   Assumptions

The researcher assumes the participants will be free of bias and fill in the questionnaire objectively.

## 4.16 Limitations

This research is a case study limited to the Information systems of Ministry of Education in Gaza strip; the results may be different in other environments. So the results should be generalized with caution.

## 4.17 Study parameters

### 4.17.1 Time horizon

The study was made at the beginning of 2017, so the collected data reflects the perceptions and facts at that time.

### 4.17.2 Location

The research is a case study. It studied the impact of users' perceptions toward the information system implemented in the Ministry of Education & Higher Education at Gaza Strip. So the results should be generalized with caution.

# Chapter 5
# Data Analysis and Results

# Chapter 5

## Data Analysis and Results

### 5.1 Introduction

This chapter includes the presentation and analysis of the most important statistical results that describe the characteristics of the research respondents and those have been reached about the problem of the study, which aims to measure and examine the impact of some external factors on the users' perceptions (Perceived ease of use & perceived usefulness) about Eservices in the Ministry of Education – Gaza. In addition, this chapter features the results of testing hypotheses. It also includes discussing and commenting on each hypothesis in light of the study problem.

This chapter is divided into the following sections: characteristics of respondents, analysis of model constructs and hypothesis testing.

### 5.2 Characteristics of respondents

Table 5.1 (Appendix E) illustrates the characteristics of the respondents (N=612). In the following charts, the researcher shows the distribution of respondents according to demographic factors (Gender, Age, Marital status, Education background, Years of experience, Position).

#### 5.2.1 Gender

Table (5.1) shows the respondent according to their Gender whereas the researcher notices that (66.5%) of the respondents are males and (33.5%) are females.

**Table (5.1): respondent according to their Gender**

| Gender | Frequency | Percent |
|--------|-----------|---------|
| Male | 407 | 66.5 |
| Female | 205 | 33.5 |
| Total | 612 | 100 |

Based on the census of the Palestinian Central Bureau of Statistics (PCBS) for 2016, the sex ratio of the population in Gaza Strip is (103.3) males per (100) females. This means that males represent about (50.81%), and females represent about (49.19%) of the population in Gaza Strip. Furthermore, based on the census of the Palestinian Central Bureau of Statistics (PCBS) for 2016, the males represent (79.9%) and female (19.1%) of the labour force in Palestine, this percentage is consistent with the

international average. Therefore, the researcher finds the distribution of respondents according to gender in MoEHE is consistent with the general distribution of the population in Gaza Strip and the statics of (PCBS).

### 5.2.2 Age

Table (5.2) shows the respondent according to their Age, the researcher notices that only (0.2%) of the respondents their ages are less than 25 years, (12%) their ages are from 25 to less than 30 years, (30%) of them their ages are 30 years to less than 35 years, (22%) of them their ages are 35 years to less than 40 years, (14%) of them their ages are 40 years to less than 45 years,   and (22%) their ages are more than 45 years.

**Table (5.2):  respondent according to their Age**

| Age | Frequency | Percent |
|---|---|---|
| Less than 25 | 1 | 0.2 |
| 25 to less than 30 | 73 | 11.9 |
| 30 to less than 35 | 181 | 29.6 |
| 35 to less than 40 | 133 | 21.7 |
| 40 to less than 45 | 87 | 14.2 |
| More than 45 | 137 | 22.4 |
| Total | 612 | 100 |

The previous distribution indicates to a low proportion of respondents less than 25 years (only one respondent) which is a result from stopping new employment in the government in the last three years which justifies this number. The statistics shows that there are a high percentage of respondents in the ages from 30 to less than 35 (181 respondents). Generally, the respondents' ages approximately distributed on the age ranges from 25 above clearly.

### 5.2.3 Marital status

Table (5.3) shows the respondents according to their marital status. The researcher noticed that (94%) of the respondents are married, and only (6%) are single.

**Table (5.3): respondent according to their marital status**

| Status | Frequency | Percent |
|--------|-----------|---------|
| Married | 576 | 94.1 |
| Single | 36 | 5.9 |
| Total | 612 | 100 |

The previous distribution explains the high percentage of married employees. The statistics show that the percentage of married couples in the Gaza Strip is high and the age of marriage is generally low, which embodies the nature of Palestinian culture. The Islamic traditions and beliefs asserted the importance of marriage to maintain the well-being of society. As a result, the high percentage is considered to be a normal matter which reflects Islamic attitudes and culture in general and the Palestinian ones in particular.

### 5.2.4  Educational background

Table (5.4) shows the respondent according to their Education level, notice that (74%) of the respondents their qualification is Bachelor, (12%) of them their qualification is Master, (11%) their qualification is Diploma (2%) their qualification is Doctoral, and (1%) their qualification is less than Diploma.

**Table (5.4): respondent according to their Educational level.**

| Educational Level | Frequency | Percent |
|-------------------|-----------|---------|
| Less than diploma | 7 | 1.1 |
| Diploma | 69 | 11.3 |
| Bachelor | 451 | 73.7 |
| Master | 74 | 12.1 |
| PhD | 11 | 1.8 |
| Total | 612 | 100 |

The previous distribution indicates to a high percentage of participants who have a bachelor's degree. This confirms that the Palestinian society is an educated society that looks for employment opportunities through the possession of educational certificates which enable such society being more productive and effective in the workplace. The nature of Gaza society appreciates the educated people, which justify the high percent of who owns a bachelor and Master degrees among the employees youth as shown in the last statistics.

### 5.2.5 Years of experience

Table (5.5) shows the respondent according to their years of experience, the researcher notices that (46%) of the respondents have 5 to less than 10 years of experience, (22%) have from 10 to less than 15 years experience, (10%) of them have from 15 to less than 20 years of experience, (10%) have less than 5 years of experience, (8%) of them have from 20 to less than 25 years of experience and (4%) of them have more than 25 years of experience.

**Table 5.5): respondent according to their experience.**

| years of experience | Frequency | Percent |
|---------------------|-----------|---------|
| Less than 5 | 59 | 9.6 |
| 5 to10 | 278 | 45.4 |
| 10 to15 | 135 | 22.1 |
| 15 to 20 | 63 | 10.3 |
| 20 to 25 | 51 | 8.3 |
| More than 25 | 26 | 4.2 |
| Total | 612 | 100 |

The statistics indicates that the highest percent of experience is devoted to the experience from 5 to less than 10 years which represents (46%) of the total participants. The reason is that thousands of employees were employed after 2008 as a result of employees strike after Palestinian division.

### 5.2.6 Respondent position

Table (5.6) shows the respondent according to their position, the researcher notices that the majority of the respondents are teachers (53.6%), (12.6%) of the respondents are head of departments, (7.5%) of them are secretaries, (2.6%) of them are educational supervisors, (6.4%) of them are administrative employees, (6.4%) of them are administrative employees, (3.6%) of them are managers, (3.6%) of them are head of divisions, (0.3%) of them are General Managers.

**Table (5.6): respondent according to their position.**

| Position | Frequency | Percent |
|----------|-----------|---------|
| General manager | 2 | 0.3 |
| Manager | 22 | 3.6 |
| Head of department | 77 | 12.6 |
| Head of Division | 22 | 3.6 |

| | | |
|---|---|---|
| Administrative | 39 | 6.4 |
| Secretary | 46 | 7.5 |
| Teacher | 328 | 53.6 |
| Supervisor | 16 | 2.6 |
| other | 60 | 9.8 |
| Total | 612 | 100 |

It is noticeable that the percentage of teachers are considered the highest one where it represents (53.6 %) of the total respondents and the lowest percentage is for general managers only (0.3%). The main reason behind this high percentage is the nature of MoEHE Eservices users, since from about 14575 users of the system; about 9961 users are teachers and only 38 general managers, 196 head of departments and 102 Head of divisions, which makes the percentages justified . "Others" contain other employees, for example engineers, accountants, medical staff, students' advisors …etc.

### 5.2.7  Respondent workplace

Table (5.7) shows the respondents according to their workplace, the researcher noticed that the respondents are distributed among the Ministry HQ and the seven directorates. (16%) working at East Gaza Directorate, (16%) working at North Gaza Directorate, (14%) working at West Gaza Directorate, (14%) working at East Khanyounis Directorate, (10%) working at Ministry Gaza HQ, (10%) working at Rafah Directorate, (9%) working at Middle Directorate, (9%) working at Khanyounis Directorate and the remaining (2%) working in other places. According to MoEHE statics, the researcher found the distribution of respondents according to their workplace at the MoEHE is consistent with the actual distribution.

**Table 5.7): respondent according to their workplace.**

| Position | Frequency | Percent |
|---|---|---|
| Ministry Gaza HQ | 62 | 10.1 |
| West Gaza directorate | 88 | 14.4 |
| East Gaza directorate | 100 | 16.3 |
| North Gaza directorate | 95 | 15.5 |
| Middle Gaza | 58 | 9.5 |
| Khanyunis directorate | 54 | 8.8 |

| | | |
|---|---|---|
| East khanyunis directorate | 84 | 13.7 |
| Rafah directorate | 59 | 9.6 |
| Other place | 12 | 2 |
| Total | 612 | 100 |

### 5.2.8 Used Information System

Table (5.8) shows the used information system by respondents, the researcher noticed that (57.7%) of the respondents using the School Management Information System (SMIS), (6%) of the respondents using the Educational supervision IS, (4.7%) of them using the Laboratories IS, (4.2%) of them using HRMS, (3.4%) of them using Books stores IS, (2.8%) of them using Libraries IS, (2.3%) of them using Training MIS, (2.1%) of them using Supplies IS, (1.8%) of them using Planning IS, (1.1%) of them using Finance IS and he remaining (13.7%) of respondents are using other information systems.

It is noticeable that the percentage of using Schools Management Information System (SMIS) is considered the highest where it represents (57.7 %) of the total respondents answers and the lowest percentage is for Finance IS only (1.1%). The main reason behind this high percentage is nature of MoEHE Eservices users, since from about 14575 users of the system; about 9961 users are teachers and they mainly use SMIS in their work tasks, and only about 50 finance employees use the Finance IS which justifies these percentages.

**Table (5.8): respondent according to information system.**

| information system | Frequency | Percent |
|---|---|---|
| SMIS | 353 | 57.7 |
| HR | 26 | 4.2 |
| FIS | 7 | 1.1 |
| Training MIS | 14 | 2.3 |
| Planning IS | 11 | 1.8 |
| Supplies IS | 13 | 2.1 |
| Books stores IS | 21 | 3.4 |
| Libraries IS | 17 | 2.8 |
| Laboratories IS | 29 | 4.7 |
| Educational Supervision IS | 37 | 6 |
| Other IS | 84 | 13.7 |

## 5.3 Analyzing Model constructs

### 5.3.1  Perceived usefulness (PU)

Table (5.9) show that the level of agreement of Perceived usefulness is high, where the means of the items ranged between 4.01 out of 5 (80.23%) for "Using the system enhances my effectiveness in my job" and 4.15 out of 5 (83.17%) for "I find the system to be useful in my job" and P-value = 0.000 for all items, which is smaller than the level of significance $\alpha$= 0.05. In addition, the total degree of the construct was 4.09 (81.76%). This result indicates that there is a high level of agreement on "**Perceived usefulness**" of Eservices from the respondents' point of view.

**Table (5.9): level of agreement of "Perceived usefulness" construct.**

| Item | Mean | Relative mean | t | Sig | Rank |
|------|------|---------------|---|-----|------|
| Using the system improves my performance in my job. | 4.0964 | 81.93% | 35.078 | .000 | 3 |
| Using the system in my job increases my productivity. | 4.0850 | 81.70% | 32.236 | .000 | 2 |
| Using the system enhances my effectiveness in my job. | 4.0114 | 80.23% | 30.364 | .000 | 4 |
| I find the system to be useful in my job. | 4.1585 | 83.17% | 36.552 | .000 | 1 |
| Perceived usefulness | 4.0878 | 81.76% | 37.504 | .000 | |

### 5.3.2  Perceived Ease of Use (PEOU)

Table (5.10) show that the level of agreement of Perceived Ease of Use is high, where the means of the items ranged between 3.97 out of 5 (79.44%) for "I find it easy to get the system to do what I want it to do" and 4.25 out of 5 (85.10%) for "I find the system to be easy to use" and P-value = 0.000 for all items, which is smaller than the level of significance $\alpha$= 0.05. In addition, the total degree of the construct was 4.15 (82.93%). This result indicates that there is a high level of agreement on "**Perceived Ease of Use**" of Eservices from the respondents' point of view.

**Table (5.10):** level of agreement of "Perceived Ease of Use" construct.

| Item | Mean | Relative Mean | t | Sig | Rank |
|---|---|---|---|---|---|
| My interaction with the system is clear and understandable | 4.2320 | 84.64% | 44.939 | .000 | 2 |
| Interacting with the system does not require a lot of my mental effort | 4.1275 | 82.55% | 34.819 | .000 | 3 |
| I find the system to be easy to use | 4.2549 | 85.10% | 43.016 | .000 | 1 |
| I find it easy to get the system to do what I want it to do | 3.9722 | 79.44% | 30.318 | .000 | 4 |
| Perceived Ease of Use | 4.1467 | 82.93% | 46.587 | .000 | |

### 5.3.3 Subjective Norm (SN)

Table (5.11) show that the level of agreement of **Subjective Norm** is high, where the means of the items ranged between 3.73 out of 5 (74.58%) for "People who influence my behavior think that I should use the system" and 3.77 out of 5 (75.36%) for "People who are important to me think that I should use the system" and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 4.15 (82.93%). This result indicates that there is a high level of agreement on "**Subjective Norm**" from the respondents' point of view.

**Table (5.11):** Level of agreement of "Subjective Norm" construct.

| Item | Mean | Relative Mean | t | Sig | Rank |
|---|---|---|---|---|---|
| People who influence my behavior think that I should use the system | 3.7288 | 74.58% | 20.666 | .000 | 2 |
| People who are important to me think that I should use the system | 3.7680 | 75.36% | 22.832 | .000 | 1 |
| Subjective Norm | 3.7484 | 74.97% | 23.376 | .000 | |

### 5.3.4  Image (IM)

Table (5.12) show that the level of agreement of **"Image"** is high, where the means of the items ranged between 3.70 out of 5 (74.08%) for "People in my organization who use the system have a high profile" and 4.25 out of 5 (84.90%) for "Having the system is a status symbol in my organization" and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 3.93 (78.60%). This result indicates that there is a high level of agreement on **"Image"** from the respondents' point of view.

**Table (5.12):** Level of agreement of "Image" construct

| Item | Mean | Relative Mean | t | Sig | Rank |
|------|------|---------------|---|-----|------|
| People in my organization who use the system have more prestige than those who do not | 3.9199 | 78.40% | 26.428 | .000 | 2 |
| People in my organization who use the system have a high profile | 3.7042 | 74.08% | 18.372 | .000 | 4 |
| Having the system is a status symbol in my organization | 4.2451 | 84.90% | 40.171 | .000 | 1 |
| My image will be enhanced in my organization when using Eservice | 3.8513 | 77.03% | 22.797 | .000 | 3 |
| Image | 3.9301 | 78.60% | 31.724 | .000 | |

### 5.3.5  Job Relevance (JR)

Table (5.13) show that the level of agreement of **"Job Relevance (JR)"** is high, where the means of the items ranged between 4.10 out of 5 (82.03%) for "In my job, usage of the Eservices is relevant" and 4.21 out of 5 (84.25%) for "In my job, usage of the Eservices is important." and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 4.15 (82.93%). This result indicates that there is a high level of agreement on "**Job Relevance (JR)**" from the respondents' point of view.

**Table (5.13):** Level of agreement of "Job Relevance" construct.

| item | Mean | relative mean | t | sig | rank |
|---|---|---|---|---|---|
| In my job, usage of the Eservices is important. | 4.2124 | 84.25% | 43.507 | .000 | 1 |
| In my job, usage of the Eservices is relevant. | 4.1013 | 82.03% | 35.215 | .000 | 3 |
| In my job, the Eservices is designed to help me doing my tasks | 4.1291 | 82.58% | 40.212 | .000 | 2 |
| Job Relevance | 4.1476 | 82.95% | 46.040 | .000 | |

### 5.3.6  Output Quality (OQ)

Table (5.14) show that the level of agreement of **"Output Quality"** is high, where the means of the items ranged between 4.05 out of 5 (81.08%) for "I have no problem with the quality of the Eservices' output" and 4.09 out of 5 (81.99%) for "The quality of the output I get from the Eservices is high" and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 4.08 (81.58%). This result indicates that there is a high level of agreement on "**Output Quality**" from the respondents' point of view.

**Table (5.14):** Level of agreement of "Output Quality" construct.

| item | Mean | relative mean | t | sig | rank |
|---|---|---|---|---|---|
| The quality of the output I get from the Eservices is high | 4.0997 | 81.99% | 37.305 | .000 | 1 |
| I have no problem with the quality of the Eservices' output | 4.0539 | 81.08% | 37.133 | .000 | 3 |
| The information I get through Eservices has high quality | 4.0833 | 81.67% | 36.426 | .000 | 2 |
| Output Quality | 4.0790 | 81.58% | 41.797 | .000 | |

### 5.3.7  Result Demonstrability (RD)

Table (5.15) show that the level of agreement of **"Result Demonstrability"** is high, where the means of the items ranged between 3.97 out of 5 (79.48%) for "I have no difficulty telling others about the results of using the Eservices" and 4.15 out of 5

(82.94%) for "The results of using the Eservices are apparent to me" and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 3.81 (76.29%). This result indicates that there is a high level of agreement on "**Result Demonstrability**" from the respondents' point of view.

**Table (5.15):** Level of agreement of "Result Demonstrability" construct.

| Item | Mean | relative mean | t | Sig | Rank |
|------|------|--------------|---|-----|------|
| I have no difficulty telling others about the results of using the Eservices | 3.9739 | 79.48% | 35.239 | .000 | 4 |
| I believe I could communicate to others the consequences of using the Eservices | 4.0377 | 80.75% | 37.249 | .000 | 2 |
| The results of using the Eservices are apparent to me | 4.1471 | 82.94% | 44.652 | .000 | 1 |
| I would have difficulty explaining why using the Eservices may or may not be beneficial | 4.0376 | 80.75% | 37.249 | .000 | 3 |
| Result Demonstrability | 4.0490 | 76.29% | 37.577 | .000 | |

## 5.3.8  Intention to Use (IU)

Table (5.16) show that the level of agreement of **"Intention to Use"** is high, where the means of the items ranged between 4.23 out of 5 (84.61%) for "I would have difficulty explaining why using the Eservices may or may not be beneficial" and 4.25 out of 5 (85.00%) for "If I where volunteer to use Eservices I will use it" and P-value = 0.000 for all items, which is smaller than the level of significance α= 0.05. In addition, the total degree of the construct was 4.241 (84.84%). This result indicates that there is a high level of agreement on "**Intention to Use**" Eservices from the respondents' point of view.

**Table (5.16):** Level of agreement of "Intention to Use" construct.

| Item | Mean | Relative Mean | t | Sig | Rank |
|---|---|---|---|---|---|
| I would have difficulty explaining why using the Eservices may or may not be beneficial | 4.2304 | 84.61% | 45.083 | .000 | 3 |
| Given that I have access to the Eservices, I predict that I would use it. | 4.2451 | 84.90% | 46.928 | .000 | 2 |
| If I where volunteer to use Eservices I will use it | 4.2500 | 85.00% | 45.948 | .000 | 1 |
| Intention to Use | 4.2418 | 84.84% | 50.293 | .000 | |

### 5.3.9 Summary of results of Model constructs

In the following table, summary of results of model constructs.

**Table (5.17):** Summary of results of Model constructs

| Construct | Mean | Relative Mean | t | Sig |
|---|---|---|---|---|
| Perceived Usefulness (PU) | 4.0878 | 81.76% | 37.504 | .000 |
| Perceived Ease of Use (PEOU) | 4.1467 | 82.93% | 46.587 | .000 |
| Subjective Norm (SN) | 3.7484 | 74.97% | 23.376 | .000 |
| Image  (PU) | 3.9301 | 78.60% | 31.724 | .000 |
| Job Relevance (JR) | 4.1476 | 82.95% | 46.040 | .000 |
| Output Quality (OQ) | 4.0790 | 81.58% | 41.797 | .000 |
| Result Demonstrability (RD) | 4.0490 | 76.29% | 37.577 | .000 |
| Intention to Use(IU) | 4.2418 | 84.84% | 50.293 | .000 |

## 5.4 Testing Hypotheses using PLS

The analysis was started depending on the theoretically-based conceptual model of the current study, shown in **Figure (1.1)**, which had been formed by the researcher based on the literature review. SmartPLS (v3.2.6) was used to test the research model and hypotheses. SmartPLS is a specialized software package for partial least square structural equation modeling (PLS-SEM).

Structural equation modeling (SEM) is "a family of statistical models that seek to explain the relationships among multiple variables". SEM examines the structure of interrelationships expressed in a series of equations, similar to a series of multiple regression equations. These equations describe the relationships among all dependent (endogenous) and independent (exogenous) variables involved in the analysis (Hair, Anderson, Babin, & Black, 2010, p. 634). Compared to other statistical techniques, SEM is the superior especially when multiple dependent variables are utilized (Schrier et al., 2010, p. 10). SEM is known by many names: covariance structure analysis, latent variable analysis, and sometimes it is even referred to by the name of the specialized software package used (e.g., a LISREL, or AMOS model) (Hair et al., 2010).

PLS is a regression-based technique which can estimate and test the relationships among constructs through path analysis (Hussein, 2010). PLS path model consists of three components: the structural model, the measurement model and the weighting scheme (Monecke & Leisch, 2012, p. 4). PLS specifies relationships in terms of measurement and structural models, which are termed outer and inner models, respectively (Hair et al., 2010, p. 776). In PLS models, weights and loadings of manifest variables indicate the strength of the measures, while the estimated path coefficients indicate the strength and the sign of the theoretical relationships of the latent variables (Hussein, 2010, p. 222).

Therefore, in this study the analysis process, using PLS, has run through two stages: Measurement Model Evaluation, and Structural Model Evaluation. In the first stage, Indicator Reliability, Construct Reliability, Convergent Validity, and Discriminant Validity have been tested. In the next stage, Coefficient of Determination ($R^2$) and Path coefficients ($\beta$) have been calculated.

### 5.4.1 Measurement Model Evaluation

The first step in the PLS analysis is the construction of the measurement model. The measurement model or outer model relates observed variables to their latent variables. Observed variables are referred to as manifest variables or indicators, latent variables as factors (Monecke & Leisch, 2012, p. 7).

The main purpose of the measurement model evaluation is to evaluate the reliability and validity of the indicators associated with the model constructs. This test includes

the evaluation of item reliability, internal consistency (construct reliability), convergent validity, and discriminant validity (Hussein, 2010, p. 220) (Hussein, 2009, pp. 220–221)

## 1. Indicator Reliability

The Indicator reliability is assessed by calculating standardized outer loading of the indicator. Indicator reliability explains the variance of individual indicator relative to the latent variable (Memon & Rahman, 2014). The reliability of each indicator should be assessed. Researchers postulate that a latent variable should explain at least 50% of each indicator's variance, which means that the absolute standardized outer loadings should be higher than 0.7 (Henseler, Ringle, & Sinkovics, 2009, p. 299).

Therefore, the manifest variables (indicators) with outer loading 0.7 or higher are considered highly satisfactory. However, the outer loading value of 0.5 is regarded as acceptable, and the manifest variables with loading value of less than 0.5 should be dropped. Moreover, some researchers argued that 0.4 should be the acceptable loading value where others suggested that manifest variable with loading values between 0.4 and 0.7 should be reviewed before elimination. (Memon & Rahman, 2014).

Hence, it is recommended to eliminate the indicator only if an indicator's reliability is low and eliminating this indicator would increase composite reliability. Sometimes, indicators with weaker outer loadings are retained on the basis of their contribution to content validity. However, indicators with very low outer loadings (below 0.40) should always be eliminated (Henseler et al., 2009, p. 299).

Hence, for the current study all indicators has outer loadings above the minimum accepted loading value and all were included in the PLS model. **Table (5.13)** shows the 24 indicators and all achieved indicator reliability requirements through having acceptable outer loading values that range between **0.781** and **0.939**. This makes all indicators are highly satisfactory.

**Table ( 5.18):** Individual reliability indicator loadings

| Latent Variable | Indicator | Indicators' Outer Loadings |
|---|---|---|
| PU | PU1 | 0.908 |
| | PU2 | 0.912 |
| | PU3 | 0.918 |
| | PU4 | 0.831 |
| PEOU | PEOU1 | 0.829 |
| | PEOU2 | 0.781 |
| | PEOU3 | 0.847 |
| | PEOU4 | 0.795 |
| SN | SN1 | 0.919 |
| | SN2 | 0.939 |
| IM | IM1 | 0.827 |
| | IM2 | 0.815 |
| | IM3 | 0.811 |
| | IM4 | 0.850 |
| JR | JR1 | 0.846 |
| | JR2 | 0.858 |
| | JR3 | 0.865 |
| OQ | OQ1 | 0.904 |
| | OQ2 | 0.883 |
| | OQ3 | 0.865 |
| RD | RD1 | 0.843 |
| | RD2 | 0.919 |
| | RD3 | 0.838 |
| | RD4 | 0.820 |
| IU | IU1 | 0.915 |
| | IU2 | 0.925 |
| | IU3 | 0.903 |

PU= Perceived Usefulness, PEOU= Perceived ease of use, SN=Subjective norms, IM=Image, JR= Job relevance, OQ=Output quality, RD=Result demonstrability.

So, the final number after assessment process of the indicator reliability is 24 indicators and we did not ignore any indicator.

## 2. Internal Consistency (Construct Reliability)

Second parameter for reliability evaluations is the internal consistency (construct reliability). Construct reliability measures the internal consistency of the manifest variables (indicators) associated with a latent construct, which means the degree to which the indicators are measuring the same concept (Hussein, 2010, p. 224).

Internal consistency is evaluated by two measures, that are, Composite Reliability (CR) and Cronbach's alpha. CR and Cronbach's alpha indicate how well a set of manifest variables appraises a single latent construct. However, compared to Cronbach alpha, composite reliability is considered a better measure of internal consistency because it employs the standardized loadings of the manifest variables. Nevertheless, the interpretation of composite reliability score and Cronbach's Alpha is the similar. It is suggested that the value of Cronbach alpha should be higher than (0.7) and also for Composite reliability the value should be 0.7 or higher (Memon & Rahman, 2014).

In the current study, all constructs met the minimum requirements; hence, no constructs were dropped. Internal consistency was assessed using the composite reliability and using Cronbach's alpha. **Table (5.19)** shows that composite reliability values of all variables are acceptable because all of them exceed the minimum requirement of (0.7).

**Table (5.19):** Internal consistency evaluation (Composite Reliability and Cronbach's Alpha)

| Construct | Cronbach's Alpha | Composite Reliability |
|:---:|:---:|:---:|
| IM | 0.845 | 0.895 |
| JR | 0.819 | 0.892 |
| OQ | 0.860 | 0.915 |
| PEOU | 0.830 | 0.887 |
| PU | 0.915 | 0.940 |
| RD | 0.878 | 0.916 |
| SN | 0.842 | 0.926 |
| IU | 0.902 | 0.939 |

Furthermore, it is obvious from the Cronbach's alpha values presented in **Table (5.19)** that all variables are also acceptable because all of them exceed the minimum requirement of (0.7).

### 3. Convergent Validity

Convergent validity is the degree to which multiple items to measure the same concept are in agreement. As suggested by F. Hair Jr, Sarstedt, Hopkins, and G. Kuppelwieser (2014), support is provided for convergent validity when each item has outer loadings above 0.70 and when each construct's average variance extracted (AVE) is 0.50 or higher. (F. Hair Jr et al., 2014)

Average variance extracted (AVE) measures the overall amount of variance in the indicators accounted for by the latent variable. Higher variances occur when the indicators are truly representative of the latent construct (Hussein, 2010, p. 224).

In the current study, AVE values of all constructs are higher than 0.5, which is the minimum accepted AVE value. **Table (5.20)** shows that the AVE values of all constructs range between 0.682 and 0.863. Furthermore, as it was demonstrated in **Table (5.19)**, the reliability of all items is above the recommendations.

**Table ( 5.20):** Convergent Validity – Average Variance Extracted (AVE)

| Construct | Average Variance Extracted (AVE) |
|:---:|:---:|
| IM | 0.682 |
| JR | 0.734 |
| OQ | 0.781 |
| PEOU | 0.662 |
| PU | 0.798 |
| RD | 0.732 |
| SN | 0.863 |
| IU | 0.836 |

### 4. Discriminant Validity

Discriminant validity represents the extent to which the construct measures what it is intended to measure. A construct is considered to be discriminant valid if it shares more variance with its indicators than with any other construct. To test this requirement, the AVE of each construct should be higher than the highest squared correlation with any other construct (F. Hair Jr et al., 2014). If the AVE for a given latent variable exceeds the squared correlation with the other latent variables, then the variable can be said to display discriminant validity. Also, to measure the

discriminant validity, the AVE square root could be used and should be greater than the correlations among the latent variables. The criterion used to assess this is by comparing the AVE with the squared correlations or the square root of the AVE with correlations (Abdi & Senin, 2015).

As shown in **Table (5.21)**, the study uses second method which is to compare the square root of the AVE with the correlations. Therefore, the validity shown in diagonal was examined and the variables satisfied the necessary conditions and all constructs exhibit the discriminant validity.

**Table (5.21):** Discriminant Validity

| Construct | IM | IU | JR | OQ | PEOU | PU | RD | SN |
|-----------|------|------|------|------|------|------|------|------|
| IM | **0.826** | | | | | | | |
| IU | 0.489 | **0.914** | | | | | | |
| JR | 0.514 | 0.536 | **0.856** | | | | | |
| OQ | 0.467 | 0.487 | 0.534 | **0.884** | | | | |
| PEOU | 0.408 | 0.481 | 0.516 | 0.558 | **0.813** | | | |
| PU | 0.515 | 0.512 | 0.521 | 0.49 | 0.484 | **0.893** | | |
| RD | 0.514 | 0.555 | 0.617 | 0.628 | 0.546 | 0.502 | **0.856** | |
| SN | 0.42 | 0.362 | 0.414 | 0.38 | 0.29 | 0.359 | 0.382 | **0.929** |

**Note:** Diagonal elements represent the square root of the AVE values while the off-diagonal elements represent the correlations.

### 5.4.2  Structural Model Evaluation

The second step in the SEM analysis is to evaluate the structural model. Structural model is used to assess the relationships between exogenous and endogenous latent variables. To evaluate these relationships, two basic indices are used: the coefficient of determination ($R2$), and the standardized coefficient path ($\beta$) (Karimi, Somers, & Gupta, 2004).

### 1.  Coefficient of Determination ($R^2$)

The R square ($R^2$) is a measure of the model's predictive accuracy. It represents the independent variables' combined effect on the dependent variable(s).  This effect ranges from 0 to 1 with 1 representing complete predictive accuracy. ($R^2$) with 0.75, 0.50, 0.25, respectively, describing substantial, moderate, and weak levels of predictive accuracy (F. Hair Jr et al., 2014). For a good model, the ($R^2$) value of each endogenous (dependent) latent variable in the model should be more than 0.26 (Memon & Rahman, 2014).

The predictive power of the model is summarized by ($R^2$) values on the dependent variables in **Figure (5.1)**. ($R^2$) values are 0.400 and 0.4217 which are higher than the suggested value. It can be concluded from the ($R^2$) values that the model predicts 40% of Perceived Usefulness (PU), 42.1% of Perceived Ease of Use, which is moderate levels of predictive accuracy.

The values of ($R^2$) represent the percentages with which the independent variables explain the variation in the dependent variable. According to PLS analysis, the value of ($R^2$) is highest in PEOU followed by PU. This suggests that the model mainly provides explanation of the variation of Perceived Ease of Use on the largest degree, then explanation of the variation of Perceived Usefulness.

In addition to ($R^2$) the research model was evaluated by looking at path coefficients ($\beta$) which indicate the strength of the relationships between the independent and dependent variables. Thus, research hypotheses are tested based on the values of path coefficients ($\beta$), and coefficients of determination ($R^2$) as will be mentioned in the next section.
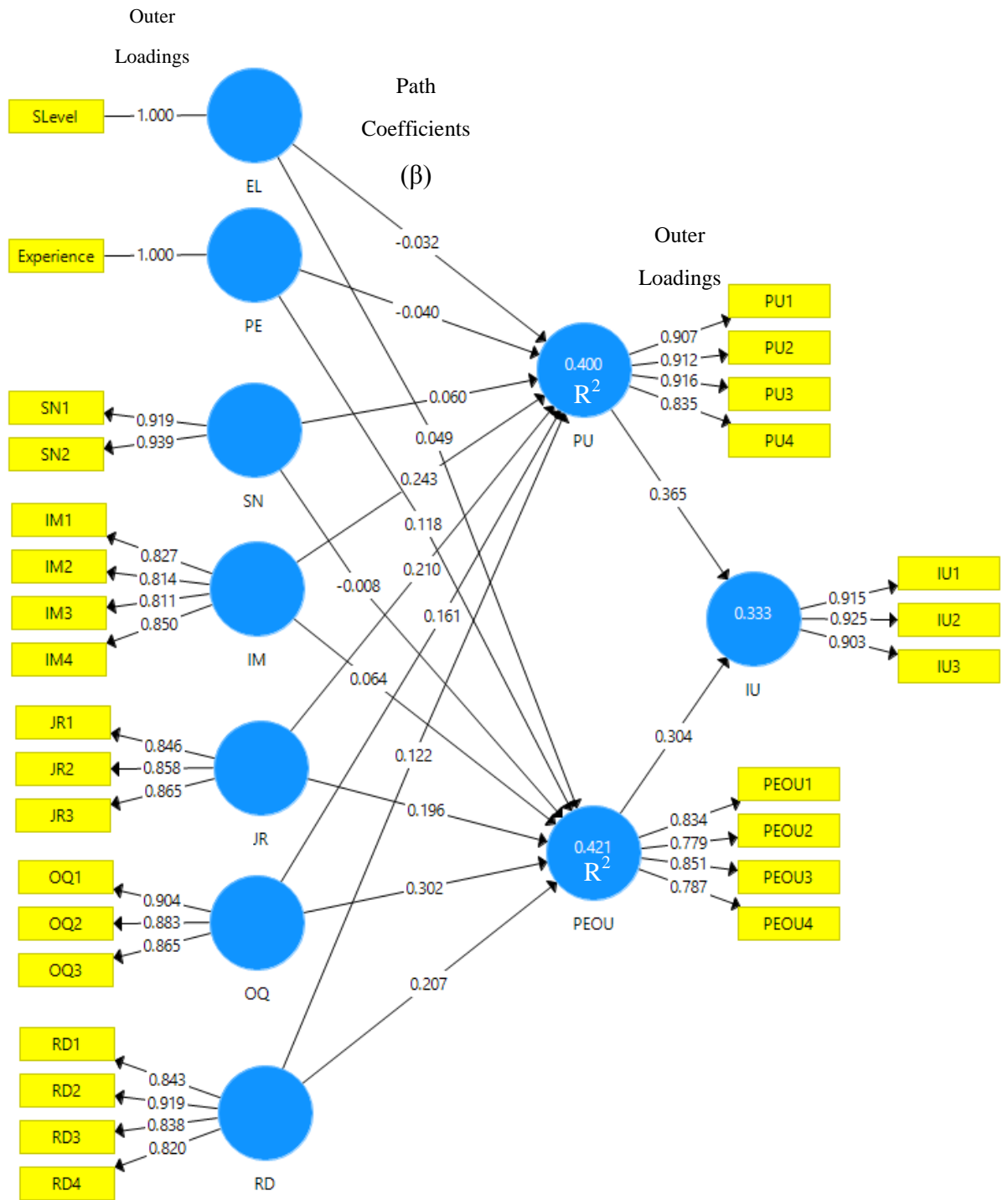
**Figure (5.1): Research Model Analysis Results**

## 2. Path coefficients (β)

After running a PLS model, estimates are provided for the path coefficients, which represent the hypothesized relationships linking the latent variables. Path coefficient values are standardized on a range from -1 to +1, with coefficients closer to +1 representing strong positive relationships and coefficients closer to -1 indicating strong negative relationships. A standard error must be obtained using bootstrapping to test path coefficient values for significance (F. Hair Jr et al., 2014). Bootstrapping is used to test the significance levels of $\beta$ values through t-value test. As it is suggested, the acceptable t-values for a two-tailed test are 1.65 (significance level = 10 percent), 1.96 (significance level = 5 percent), and 2.58 (significance level = 1 percent) (Memon & Rahman, 2014).

In the current study, re-sampling (bootstrapping, 5000) was used to compute the t-statistic values. The results, presented in **Table (5.22)**, show that all t-statistics exceed the minimum suggested values and, hence, all hypothesized relationships were significant.

**Table (5.22):** Summary of PLS graph results

| Hypothesizes | | Path Coefficients (β) | T Statistics | P Values | |
|---|---|---|---|---|---|
| H1 | EL ➔ PEOU | 0.049 | 1.736 | 0.112 | Not supported |
| H2 | EL ➔ PU | -0.032 | 1.033 | 0.308 | Not supported |
| H3 | PE ➔ PEOU | 0.118 | 4.036 | 0.000 | supported |
| H4 | PE ➔ PU | -0.040 | 1.457 | 0.152 | Not supported |
| H5 | JR ➔ PEOU | 0.196 | 4.004 | 0.000 | supported |
| H6 | JR ➔ PU | 0.210 | 4.155 | 0.000 | supported |
| H7 | OQ ➔ PEOU | 0.302 | 5.868 | 0.000 | supported |
| H8 | OQ ➔ PU | 0.161 | 3.408 | 0.002 | supported |
| H9 | RD ➔ PEOU | 0.207 | 3.93 | 0.000 | supported |
| H10 | RD ➔ PU | 0.122 | 2.508 | 0.014 | supported |
| H11 | IM ➔ PEOU | 0.064 | 1.593 | 0.111 | Not supported |
| H12 | IM ➔ PU | 0.243 | 4.534 | 0.000 | supported |
| H13 | SN ➔ PEOU | -0.008 | 0.13 | 0.855 | Not supported |
| H14 | SN ➔ PU | 0.060 | 1.36 | 0.189 | Not supported |
| H15 | PEOU ➔ IU | 0.304 | 7.419 | 0.000 | supported |
| H16 | PU ➔ IU | 0.365 | 8.013 | 0.000 | supported |

The next step, path coefficients of all latent variables (paths) were evaluated by comparing $\beta$ values among all the paths **Figure (5.1).** The highest $\beta$ value refers to

the strongest effect of predictor (independent) latent variable towards the dependent latent variable.

## 5.5 Results of Hypotheses Testing

As shown in **Figure (5.1), Table (5.22),** the results of PLS analysis present an empirical support for Hypotheses H3,H4, H5, H6, H7, H8, H9, H10, H12, H15 and H16. But, the Hypotheses H1, H2, H4, H11, H13, and H14 are not supported.

The paths **H6**: JR ➔ PU ($\beta$= 0.210, p< 0.05), **H8**: OQ ➔ PU ($\beta$= 0.161, p< 0.05), **H12:** IM ➔ PU ($\beta$= 0.244, p< 0.05) and **H10**: RD ➔ PU ($\beta$= 0.122, p< 0.05) and indicates that there are a positive significant impact from the factors (Job Relevance, Output Quality, Image and Result Demonstrability) on the "Perceived Usefulness". As noted from $\beta$ coefficient the relationship is positive for all factors.
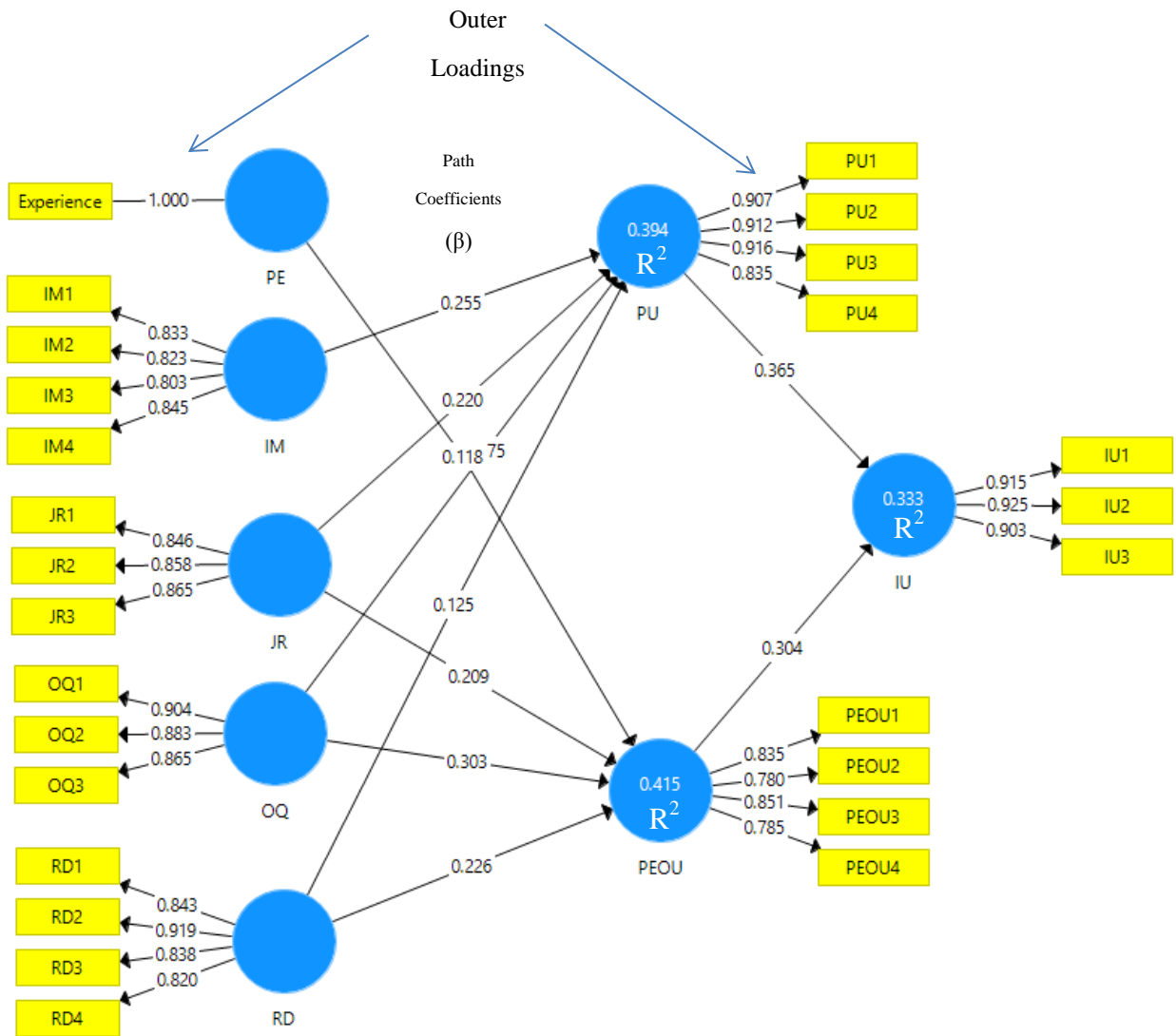
Furthermore, The paths **H3**: PE ➔ PEOU ($\beta$= 0.118, p< 0.05), **H5:** JR ➔ PEOU ($\beta$= 0.196, p< 0.05), **H7**: OQ ➔ PEOU ($\beta$= 0.302, p< 0.05) and **H9**: RD ➔ PEOU ($\beta$= 0.207, p< 0.05) indicates that there are a significant impact from the factors (Job Relevance, Output Quality, Prior Experience and Result Demonstrability) on the "Perceived Ease of Use ". As noted from $\beta$ coefficient the relationship is positive for all factors.

And also the results showed that there are positive significant impacts from the factors ("Perceived Usefulness", "Perceived Ease of Use") on "Intention to use"

Therefore, the researcher removed the non-significant paths (H1, H2, H4, H11, H13, and H14) from the research model, the new model shown in **Figure (5.2)**.

So, the paths **H5:** JR ➔ PEOU, **H7**: OQ ➔ PEOU, **H3**: PE ➔ PEOU and **H9**: RD ➔ PEOU, are particularly valid, where it explains 41.5% of the variation in PEOU. Followed by the paths **H6**: JR ➔ PU, **H8**: OQ ➔ PU and **H10**: RD ➔ PU, **H12:** IM ➔ PU, where it explains 39.4% of the variation in PU.

Also, the paths **H15:** PEOU ➔ IU, **H16**: PU ➔ IU, are also valid, where it explains 33.3% of the variation in IU.

Path
Coefficients
(β)

Experience — 1.000 — PE

IM1
IM2 — 0.833
IM3 — 0.823
IM4 — 0.803
0.845
IM

JR1
JR2 — 0.846
JR3 — 0.858
0.865
JR

OQ1
OQ2 — 0.904
OQ3 — 0.883
0.865
OQ

RD1
RD2 — 0.843
RD3 — 0.919
RD4 — 0.838
0.820
RD

0.255
0.220
0.118  75
0.125
0.209
0.303
0.226

0.394 $R^2$ PU
0.907 — PU1
0.912 — PU2
0.916 — PU3
0.835 — PU4

0.365

0.333 $R^2$ IU
0.915 — IU1
0.925 — IU2
0.903 — IU3

0.304

0.415 $R^2$ PEOU
0.835 — PEOU1
0.780 — PEOU2
0.851 — PEOU3
0.785 — PEOU4

**Figure (5.2): Modified Research Model Analysis Results excluding non-significant paths**

This again suggests the strength of the model in explaining the variation of the "Perceived Ease of Use" and the "Perceived Usefulness" variables. It highlights the effect of four external factors ("Image", "Job Relevance", "Output Quality" and "Result Demonstrability") on "Perceived Usefulness". It also highlights the effect of four external factors ("Prior Experience", "Job Relevance", "Output Quality" and "Result Demonstrability") on "Perceived Ease of Use".

It also explains the variation of "Intention to Use" (IU) variable. It highlights the effect of "Perceived Usefulness" and "Perceived Ease of Use" on "Intention to Use" as hypothesized in original TAM model. It indicates that 33.3% of variance in "Intention to Use" variable explained by "Perceived Usefulness" and "Perceived Ease

of Use" variables and (β = 0.365) for PU➔IU path and (β = 0.304) for PEOU➔IU path, that mean that the effect of "Perceived Usefulness" is stronger. This result is consistent with TAM theory and most previous studies results.

## 5.6 Discussion of Hypotheses Testing Results

The study's main findings that are summarized in **Table (5.22)** will be discussed in detail in this section comparing with the findings of the similar previous studies.

### 5.6.1   Educational Level: (Hypothesis 1 and Hypothesis 2)

**H1:** "There is a statistical significant relationship between "Educational Level" and "perceived ease of use" about the MoEHE Eservices at 0.05 level".

**H2:** "There is a statistical significant relationship between "Educational Level" and "perceived usefulness" about the MoEHE Eservices at 0.05 level".

The results shows that there are not significant relationships between "Educational Level" of MoEHE Eservices users with "Perceived Usefulness" nor "Educational Level" of MoEHE Eservices users with "Perceived Ease of Use". For the path **H1**: EL ➔ PEOU (β= 0.049, p= 0.083) and the path **H2**: EL ➔ PU (β= -0.033, p= 0.302). So the Hypothesizes H1 and H2 are not supported. This result is consistent with the results of (Vathanophas et al., 2008) study that found the "Educational Level" did not affect the Naval officers perceptions. The results also were consistent with the researcher's expectations. The researcher think that the MoEHE Eservices designed and implemented to be useful, simple and user-friendly, this makes the increase in educational level do not affect user perceptions since most system users have at least bachelor degree which is more than enough to use system easily and understand its features, which means that the higher degrees does not affect user perception toward system.

### 5.6.2   Prior Experience: (Hypothesis 3 and Hypothesis 4)

**H3:** There is a statistical significant relationship between Prior experience and "perceived ease of use" about the MoEHE Eservices at 0.05 level.

**H4:** There is a statistical significant relationship between Prior experience and "perceived usefulness" about the MoEHE Eservices at 0.05 level.

The results show that there is not a significant relationship between "Prior experience" of MoEHE Eservices users and "Perceived Usefulness", but there is a significant relationship between "Prior Experience" of MoEHE Eservices users with "Perceived Ease of Use". For the path **H3**: PE ➔ PEOU (β= 0.118, p= 0.000) and the path **H4**: PE ➔ PU (β= -0.040, p= 0.146) so the Hypothesis H3 is supported and H4 is not supported. This result is consistent with the results of (Vathanophas et al.,

2008) study that found the "Prior experience" did not affect the Naval officers "perceived usefulness" but had a significant relationship with their " Perceived Ease of Use". The study revealed significant relation between "prior experience" and "perceived ease of use". When employees have experience using specific information technology, they will tend to know its features and how to use them; therefore, becoming more familiar with that information technology. As a result, they will perceive it *easier to use* than those who have less experience. From empirical research studying prior experience, (S. Taylor & P. Todd, 1995; Venkatesh & Morris, 2000) found correlations between prior experience and success in implementing new technology in a company. (Livingstone, White, Nelson, & Tabak, 2002) found that experience can positively change a user's attitude toward new information system usage. Prior experience can also be linked with computer anxiety, as hypothesized by (Venkatesh & Davis, 2000), explaining that when people gain more experience with information technology, they tend to reduce their perception of computer anxiety. This reduction in the level of a user's computer anxiety would reduce negative perception toward using information technology. On the other hand, changing to a very different technology can balance any positive improvements caused by experience. In similar situations, (Scholtz & Wiedenbeck, 1990). This may be the reason of the weakness and insignificance of the relation with "perceived usefulness".

The researcher concludes that the more experience user have the more he perceives the Eservices simple and user-friendly.

### 5.6.3 Job Relevance: (Hypothesis 5 and Hypothesis 6)

**H5:** "There is a statistical significant relationship between "Job Relevance" and "perceived ease of use" about the MoEHE Eservices at 0.05 level".

**H6:** "There is a statistical significant relationship between "Job Relevance" and "perceived usefulness" about the MoEHE Eservices at 0.05 level".

The results show that there are significant relationships between "Job Relevance" of MoEHE Eservices with "Perceived Usefulness" and "Job Relevance" of MoEHE Eservices with "Perceived Ease of Use". For the path **H5**: JR ➔ PEOU (β= 0.194, p= 0.000) and the path **H6**: JR ➔ PU (β= 0.209, p= 0.000). So the Hypothesis H5 and H6 are supported. H6 supporting result is consistent with the results of (Vathanophas et al., 2008) study that found the "Job Relevance" affected the Naval officers "Perceived Usefulness" and also was consistent with (Chismar & Wiley-Patton, 2002; Venkatesh & Davis, 2000; M.-Y. Wu, Chou, Weng, & Huang, 2011) results that showed positive significant relationship between "Job Relevance" and "Perceived Usefulness". The researcher thinks that if the information system is relevant to the employee's job tasks, it will positively affect his perception toward system. When information technology provides features and functions that relate and fit to the characteristics and requirements of a task, the users will find it useful, and

tend to have positive attitudes toward new information technology (Goodhue & Thompson, 1995). Therefore, users will believe that information technology will help them perform their tasks more conveniently by working electronically rather than manually. Moreover, Goodhue and Thompson (1995) proposed that "information systems have a positive effect on performance only when there is a correlation between their functionality and task requirements".

### 5.6.4 Output Quality: (Hypothesis 7 and Hypothesis 8)

**H7:** "There is a statistical significant relationship between "Output Quality" and "perceived ease of use" about the MoEHE Eservices at 0.05 level".

**H8:** "There is a statistical significant relationship between "Output Quality" and "perceived usefulness" about the MoEHE Eservices at 0.05 level".

The results show that there are significant relationships between "Output Quality" of MoEHE Eservices with "Perceived Usefulness" and "Output Quality" of MoEHE Eservices with "Perceived Ease of Use". For the path **H7**: OQ ➔ PEOU (β= 0.304, p= 0.000) and the path **H8**: OQ ➔ PU (β= 0.161, p= 0.001). So the Hypothesis H7 and H8 are supported. H8 supporting result is consistent with the results of (Vathanophas et al., 2008) study that found the "Output Quality" was affecting the Naval officers "Perceived Usefulness" and it is also consistent with (Chismar & Wiley-Patton, 2002; Venkatesh & Davis, 2000; M.-Y. Wu et al., 2011) results that showed positive significant relationship between "Output Quality" and "Perceived Usefulness". The researcher thinks that if the quality of information system outputs is good and problems free and the employees do not need further testing and modification, it will positively affect their usefulness and ease of use perception toward system.

### 5.6.5 Image: (Hypothesis 11 and Hypothesis 12)

**H11:** There is a statistical significant relationship between "Image" and perceived ease of use about the MoEHE Eservices at 0.05 level.

**H12:** There is a statistical significant relationship between "Image" and perceived usefulness about the MoEHE Eservices at 0.05 level.

The results shows that there is a significant relationship between "Image" of using MoEHE Eservices and "Perceived Usefulness", but there is not a significant relationship between "Image " of using MoEHE Eservices with "Perceived ease of use". For the path **H11**: IM ➔ PEOU (β= 0.066, p= 0.112) and the path **H12**: IM ➔ PU (β= 0.244, p= 0.000) so the Hypothesis H11 is not supported and H12 is supported. This result is consistent with the results of (Vathanophas et al., 2008) study that found the "Image" affect significantly the Naval officers "perceived usefulness" but did not had a significant relationship with their " Perceived Ease of Use". It is also consistent with (Chismar & Wiley-Patton, 2002; Venkatesh & Davis,

2000; M.-Y. Wu et al., 2011) results that showed positive significant relationship between "Image" and "Perceived Usefulness". When user thinks that using the system will enhance his image, he will have good perceptions about it and he will trend to use it.

### 5.6.6 Result Demonstrability: (Hypothesis 9 and Hypothesis 10)

**H9:** "There is a statistical significant relationship between "Result Demonstrability" and perceived ease of use about the MoEHE Eservices at 0.05 level".

**H10:** "There is a statistical significant relationship between "Result Demonstrability" and perceived usefulness about the MoEHE Eservices at 0.05 level".

The results show that there are significant relationships between "Result Demonstrability" of MoEHE Eservices with "Perceived Usefulness" and "Result Demonstrability" of MoEHE Eservices with "Perceived Ease of Use". For the path **H9**: RD ➜ PEOU (β= 0.205, p= 0.000) and the path **H10**: RD ➜ PU (β= 0.122, p= 0.012). So the Hypothesis H9 and H10 are supported. H10 supporting result is consistent with the results of (Chismar & Wiley-Patton, 2002; Venkatesh & Davis, 2000; M.-Y. Wu et al., 2011) that showed positive significant relationship between "Result Demonstrability" and "Perceived Usefulness". If users using information system can easily attribute gains in their job performance specifically to their use of the system, their perception toward system will be affected positively and they will intend to use system. Agarwal and Prasad (1999) found a significant correlation between usage intentions and result demonstrability. The relationship between result demonstrability and perceived usefulness is also consistent with the job characteristics model, which emphasizes knowledge of the actual results of work activities as a key psychological state underlying work motivation.

### 5.6.7 Subjective Norms: (Hypothesis 13 and Hypothesis 14)

**H13:** "There is a statistical significant relationship between "Subjective norms" and perceived ease of use about the MoEHE Eservices at 0.05 level".

**H14:** "There is a statistical significant relationship between "Subjective norm" and perceived usefulness about the MoEHE Eservices at 0.05 level".

The results show that there are not significant relationships between "Subjective norms" with "Perceived Usefulness" nor "Subjective norm" with "Perceived Ease of Use". For the path **H13**: SN ➜ PEOU (β= -0.006, p= 0.897) and the path **H14**: SN ➜ PU (β= 0.060, p= 0.174). So the Hypothesis H13 and H14 are not supported. This result is consistent with the results of (Vathanophas et al., 2008) study that found the "Subjective norm" did not affect the Naval officers' "Perceived Usefulness" and "Perceived Ease of Use". Since most MoEHE Eservices users are highly educated, their perceptions may not affected easily by others opinions, but it can affect the

system usage decision if it was voluntary. Generally, using Eservices in the MoEHE is mandatory, since the usage decision is taken by higher level managers, but anyway, users' intentions may affect the success of implementation of new systems.

### 5.6.8 Intention to use: (Hypothesis 15 and Hypothesis 16)

**H15:** "There is a statistical significant relationship between "perceived ease of use" and "Intention to use" the MoEHE Eservices at 0.05 level".

**H16:** "There is a statistical significant relationship between "perceived usefulness" and "Intention to use" the MoEHE Eservices at 0.05 level".

The results show that there are significant relationships between "perceived ease of use" of MoEHE Eservices with "Intention to use" and "perceived usefulness" of MoEHE Eservices with "Intention to use". For the path **H15**: PEOU ➔ IU ($\beta$= 0.304, p= 0.000) and the path **H16**: PU ➔ IU ($\beta$= 0.365, p= 0.000). So the Hypothesis H15 and H16 are supported. Supporting these hypothesizes is consistent with TAM model hypothesis and the results of most previous studies (Çelik & Yilmaz, 2011; Chismar & Wiley-Patton, 2002; MEI-YING WU, 2011; Vathanophas et al., 2008; Venkatesh & Davis, 2000; M.-Y. Wu et al., 2011).

# Chapter 6

# Conclusions
# and
# Recommendations

# Chapter 6

## Conclusions and Recommendations

### 6.1 Introduction

This study evaluated the effect of seven external factors on users' perceptions toward MoEHE Eservices to explore their impact on system success using modified "Technology Acceptance Model" (TAM). In this section, the researcher summarized the findings that the study discovered through the data analysis. These findings are derived after analyzing the data regarding the employees' perceptions toward Eservice system in MoEHE - Gaza Strip.   This is followed by study recommendations and suggested new topics for future research.

This chapter carries forward the discussion from the previous chapter and summarizes the key findings and conclusions of the current study. In addition, it includes practical recommendations and theoretical suggestions for future research.

### 6.2 Conclusions

In light of the findings that presented in the previous chapter, the following important conclusions can be summarized:

### 6.2.1  "Educational Level" and its relationship with users' perceptions

1) It is concluded that "Educational Level" does not have a significant relationship with employees' perceptions ("Perceived Usefulness" and "Perceived Ease of Use" toward MoEHE Eservices, which may be interpreted as that the educational level of the employees did not affect their opinions about simplicity and usefulness of the system.
2) The employees' responses to the "Educational Level" field in the questionnaire can be interpreted as that most  system users with high scientific level and most of them get at least bachelor's degree (88%).
3) The researcher concluded that the Eservices system designed and implemented to be simple and user- friendly, so higher levels of education do not needed to deal with the system.

### 6.2.2  "Prior Experience" and its relationship with users' perceptions

1) It is concluded that "Prior Experience" did not has a significant relationship with employees "Perceived Usefulness" but it affected significantly "Perceived Ease of Use" toward MoEHE Eservices , which may be interpreted as that higher experience of the employees affected positively

their "Perceived Ease of Use" , but did not affect "Perceived Usefulness" of the system.

2) The effect of "Prior Experience" is the weakest among the effects of other factors on "Perceived Ease of Use".

3) the researcher concluded that the Eservices system designed and implemented to be simple and user- friendly, so using the system do not need expert employees. Also, the training conducted at the first launch supported by "UNICEF" filled the gabs between expert employees and others with less experience.

### 6.2.3 "Job Relevance" and its relationship with users' perceptions

1) It is concluded that " Job Relevance " has significant positive relationships with both employees "Perceived Usefulness" and "Perceived Ease of Use" toward MoEHE Eservices, which may be interpreted as that when the employee find that the system features is designed to fit with his job tasks, he will perceive the system easier to use and more useful which may influence his intention to use system positively.

2) By analyzing respondents answers, the researcher found that the level of agreement about the "Job Relevance" is high (relative mean= 83%), which means that they believe that system functions and features are related to their jobs tasks.

3) The researcher conclude that, since the Eservices system designed and implemented internally by IT department staff with high cooperation with specialized Ministry departments, this makes system features and functions highly related to specific jobs tasks which appears in respondents answers.

### 6.2.4 "Output Quality" and its relationship with users' perceptions

1) It is concluded that "Output Quality" has significant positive relationships with both employees "Perceived Usefulness" and "Perceived Ease of Use" toward MoEHE Eservices, which may be interpreted as that when the employee find that the quality of system outputs is high and problem free, he will perceive the system easier to use and more useful which may influence his intention to use system positively.

2) By analyzing respondents answers, the researcher found that the level of agreement about the "Output Quality" is high (relative mean= 81.6%), which means that they believe that the quality of system outputs is high.

3) The effect of "Output Quality" is the strongest among the effects of other factors on "Perceived Ease of Use".

### 6.2.5 "Image" and its relationships with users' perceptions

1) It is concluded that "Image" has a significant relationship with employees "Perceived Usefulness" toward MoEHE Eservices but does not have

significant relationship with "Perceived Ease of Use", which may be interpreted as, that employees beliefs that "using Eservices will enhance their image" affected positively employees' perception about usefulness of the system but did not affect their perceptions about its simplicity.

2) The level of agreement about the "Image" field in the questionnaire is high (relative mean= 78.6%), which means that employees believe that their image can be enhanced when they use Eservices in doing their jobs tasks.

3) The effect of "Image" is the strongest among the effects of other factors on "Perceived Usefulness".

## 6.2.6 "Result Demonstrability" and its relationship with users' perceptions

1) It is concluded that " Result Demonstrability " has significant positive relationships with both employees "Perceived Usefulness" and "Perceived Ease of Use" toward MoEHE Eservices, which may be interpreted as if users using Eservices can easily attribute enhancements in their job performance specifically to their use of Eservices, their perception toward it will be affected positively and they will intend to use system.

2) By analyzing respondents answers, the researcher found that the level of agreement about the "Result Demonstrability" is high (relative mean= 76.3%), which means that employees can attribute gains in their job performance specifically to their use of Eservices.

3) The effect of "Result Demonstrability" is the weakest among the effects of other factors on "Perceived Ease of Use".

## 6.2.7 "Subjective norms" and its relationships with users' perceptions

1) It is concluded that "Subjective norms" do not have a significant relationships with employee's perceptions ("Perceived Usefulness" and "Perceived Ease of Use" toward MoEHE Eservices, which may be interpreted as that the subjective norms did not affect employees' opinions about simplicity and usefulness of the system.

2) Since this result is confusing, the researcher made further analysis to explore the effect of "Subjective norms" on users' "Intention to use" and found a positive significant relationship between "Subjective norms" and "Intention to use" system.

3) The researcher concluded that, since most MoEHE Eservices users are highly educated as seen in analysis results, their perception may be not affected easily by Subjective norms, but their "Intention to use" affected positively.

4) The researcher found that the level of agreement about the "Subjective norms" field in the questionnaire is high (relative mean= 75%), which means

that the employees perceive social pressure in their working environment supporting using Eservices in doing job tasks, this perception did not affect their perception but affect their intentions.

### 6.2.8 Perceived Usefulness

1) The analyzed study model in **Figure (5.1)** reveals that for "Perceived Usefulness" $R^2=0.400$ which means that 40% of variance in "Perceived Usefulness" is explained by the model, which is acceptable level.
2) The "Perceived Usefulness" was affected positively by the following factors ordered by the strength of effect: (Image, Job Relevance, Output Quality and Result Demonstrability).

### 6.2.9 Perceived Ease of Use

1) The analyzed study model in **Figure (5.1)** reveals that for "Perceived Ease of Use" $R^2=0.421$ which means that 42.1% of variance in "Perceived Ease of use" is explained by the model, which is acceptable level.
2) The "Perceived Ease of Use" affected positively by the following factors ordered by the strength of effect: (Output Quality, Result Demonstrability, Job Relevance and Prior Experience).

### 6.2.10 Intention to use

1) As expected, the analyzed study model **Figure (5.1)** reveals that "Perceived Usefulness" positively related to employees "Intention to use" Eservices. Also, It showed also that "Perceived Ease of Use" is positively related to employees "Intention to use" Eservices which is consistent with the "Technology Acceptance Model" (TAM).
2) As seen in **Figure (5.1)**, $R^2=0.333$ which means 33.3% of variance in "Intention to use" is explained by the variance of "Perceived Usefulness" and "Perceived Ease of Use".
3) However, it is found that the effect of "Perceived Usefulness" is stronger than the effect of "Perceived Ease of Use" which means that the perception about usefulness will affect intention to use more than the perception about simplicity of system which is consistent with the "Technology Acceptance Model" (TAM).
4) The level of agreement about the "Intention to use" field in the questionnaire is high (relative mean= 84.84%), which means that the employees generally intend to use Eservices in doing job tasks.

## 6.3 Recommendations

### 6.3.1 Practical Recommendations

1) Most MoEHE employees intend to use new information systems, so we recommend implementing new systems since it has good opportunities to success if implemented to be user friendly and with cooperation with particular departments.
2) Information system Output quality is an important factor for enhancing users' intention to use and system success, so MoEHE should concentrate on improving quality of systems outputs.
3) To enhance users' acceptance, employees should be involved in the design and implementation of Information system and ensure its relevance to their job tasks.
4) Training and orientation is vital when adapting new Information Systems, it can overcome the lack of user experience. So organizations should use them to prevent Information System adaption failure.
5) To enhance users' acceptance, organizations must adapt easy to use and useful information systems.
6) Organization must promote system features and performance gains to users to enhance their perceptions which may enhance user acceptance.

### 6.3.2 Future researches

1) The current research studied MoEHE Eservice as a whole, since Eservices system contains several software packages that used by particular departments or sectors, the researcher recommends to study each of these software packages separately.
2) Also the study can be extended by applying the model in each educational directorate separately.
3) The model can be extended by adding additional external factors (i.e. Training, commitment, autonomy and trust) to identify their impact.

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# Appendices

# Appendix A: TAM2 Measurement Scales and Reliabilities

## (Venkatesh & Davis, 2000)

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**Intention to Use** — (Cronbach's $\alpha$ ranged from 0.82 to 0.97 across studies and time periods)
- Assuming I have access to the system, I intend to use it.
- Given that I have access to the system, I predict that I would use it.

**Perceived Usefulness** — (Cronbach's $\alpha$ ranged from 0.87 to 0.98 across studies and time periods)
- Using the system improves my performance in my job.
- Using the system in my job increases my productivity.
- Using the system enhances my effectiveness in my job.
- I find the system to be useful in my job.

**Perceived Ease of Use** — (Cronbach's $\alpha$ ranged from 0.86 to 0.98 across studies and time periods)
- My interaction with the system is clear and understandable.
- Interacting with the system does not require a lot of my mental effort.
- I find the system to be easy to use.
- I find it easy to get the system to do what I want it to do.

**Subjective Norm** — (Cronbach's $\alpha$ ranged from 0.81 to 0.94 across studies and time periods)
- People who influence my behavior think that I should use the system.
- People who are important to me think that I should use the system.

**Voluntariness** — (Cronbach's $\alpha$ ranged from 0.82 to 0.91 across studies and time periods)
- My use of the system is voluntary.
- My supervisor does not require me to use the system.
- Although it might be helpful, using the system is certainly not compulsory in my job.

**Image** — (Cronbach's $\alpha$ ranged from 0.80 to 0.93 across studies and time periods)
- People in my organization who use the system have more prestige than those who do not.
- People in my organization who use the system have a high profile.
- Having the system is a status symbol in my organization.

**Job Relevance** — (Cronbach's $\alpha$ ranged from 0.80 to 0.95 across studies and time periods)
- In my job, usage of the system is important.
- In my job, usage of the system is relevant.

**Output Quality** — (Cronbach's $\alpha$ ranged from 0.82 to 0.98 across studies and time periods)
- The quality of the output I get from the system is high.
- I have no problem with the quality of the system's output.

**Result Demonstrability** — (Cronbach's $\alpha$ ranged from 0.80 to 0.97 across studies and time periods)
- I have no difficulty telling others about the results of using the system.
- I believe I could communicate to others the consequences of using the system.
- The results of using the system are apparent to me.
- I would have difficulty explaining why using the system may or may not be beneficial.

# استبانـة

عزيزي الموظف،،

يقوم الباحث بدراسة تأثير عدد من العوامل على تقبل الموظفين لنظام الخدمات الإلكترونية بوزارة التربية والتعليم العالي بقطاع غزة وتأثير ذلك على نجاح النظام، وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في إدارة الأعمال من الجامعة الإسلامية بغزة.

ومن منطلق إيماننا بأنكم كعاملين بوزارة التربية والتعليم العالي تمتلكون من الخبرة والتجربة ما يجعلكم المصدر الأمثل للحصول على المعلومات المطلوبة بدقة وأمانة، فإننا نأمل منكم التكرم بتعبئة الإستبانة المرفقة باختيار الإجابات التي تعكس واقع العمل لديكم، مع التأكيد بأن المعلومات التي سيتم الحصول عليها ستستخدم فقط لأغراض البحث العلمي وسيتم التعامل معها بسرية تامة.

شاكراً لكم حسن تعاونكم،

ونقدر لكم جهدكم ووقتكم الثمين في تعبئة الإستبانة.

الباحث: محمد زايد فارس

برنامج ماجستير إدارة الأعمال – كلية التجارة

الجامعة الإسلامية – بغزة

| | أولاً: بيانات عامة |
|---|---|
| **1. الجنس** | ☐ ذكـر               ☐ أنثـى |
| **2. الحالة الإجتماعية** | ☐ متزوج               ☐ أعزب |
| **3. مكان العمل** | ☐ الوزارة          ☐ مديرية غرب غزة          ☐ مديرية شرق غزة<br>☐ مديرية شمال غزة          ☐ مديرية الوسطى          ☐ مديرية خان يونس<br>☐ مديرية شرق خانيونس☐ مديرية رفح          ☐ غير ذلك _____ |
| **4. العمر** | ☐ أقل من 25 عاماً     ☐ 25 إلى أقل من 30     ☐ 30 إلى أقل من 35<br>☐ 35  إلى أقل من 40     ☐ 40 إلى أقل من 45     ☐ 45 فأكثر. |
| **5. الدرجة العلمية** | ☐ أقل من دبلوم          ☐ دبلوم (شهادة متوسطة)<br>☐ بكالوريوس          ☐ماجستير          ☐دكتوراه |
| **6. المسمى الوظيفي** | ☐ مدير عام          ☐ مدير دائرة          ☐ رئيس قسم<br>☐ رئيس شعبة          ☐ موظف إداري          ☐ سكرتير<br>☐ معلم          ☐ غير ذلك _____ |
| **7. سنوات الخبرة في الوظيفة الحالية** | ☐ أقل من 5 سنوات.          ☐ 5 إلى أقل من 10 سنوات.<br>☐ 10 إلى أقل من 15 سنة          ☐ 15 إلى أقل من 20 سنة.<br>☐ 20 سنة إلى أقل من 25 سنة          ☐ 25 سنة فأكثر. |
| **8. نظم المعلومات التي تستخدمها:<br>(يمكن اختيار أكثر من بند)** | ☐ نظام الإدارة المدرسية          ☐ نظام الشؤون الإدارية<br>☐ نظام الشؤون المالية          ☐ نظام إدارة التدريب<br>☐ نظام التخطيط التربوي          ☐ نظام إدارة اللوازم والعهد<br>☐ غير ذلك _____ |

يرجى التكرم باختيار الإجابة بناءً على درجة موافقتك على كل من العبارات التالية:

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | الرأي |
|:---:|:---:|:---:|:---:|:---:|:---:|
| 5 | 4 | 3 | 2 | 1 | درجة الموافقة |

## 1) المنفعة المدركة لنظام الخدمات الإلكترونية Perceived Usefulness (PU)

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | إن استخدام نظام الخدمات الإلكترونية في مكان عملي ... | |
|:---:|:---:|:---:|:---:|:---:|:---|:---:|
| 5 | 4 | 3 | 2 | 1 | يحسن من أدائي الوظيفي. | 1 |
| 5 | 4 | 3 | 2 | 1 | يزيد من إنتاجيتي في عملي. | 2 |
| 5 | 4 | 3 | 2 | 1 | يحسن من فاعليتي في وظيفتي. | 3 |
| 5 | 4 | 3 | 2 | 1 | يفيدني في أداء مهامي الوظيفية. | 4 |

## 2) سهولة الإستخدام المدركة لنظام الخدمات الإلكترونية Perceived Ease of Use (PEOU)

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | البنـــود | |
|:---:|:---:|:---:|:---:|:---:|:---|:---:|
| 5 | 4 | 3 | 2 | 1 | أجد أن التعامل مع الخدمات الإلكترونية في عملي واضح ومفهوم. | 1 |
| 5 | 4 | 3 | 2 | 1 | التفاعل مع نظام الخدمات الإلكترونية في مكان عملي لا يتطلب الكثير من الجهد العقلي. | 2 |
| 5 | 4 | 3 | 2 | 1 | أجد أن نظام الخدمات الإلكترونية سهل الإستخدام. | 3 |
| 5 | 4 | 3 | 2 | 1 | أجد أنه من السهل أن أجعل نظام الخدمات الإلكترونية يؤدي ما أود منه تأديته في عملي. | 4 |

**3) السلوك الشخصي Subjective Norm (SN)**

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | في مكان عملي ... | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | الأشخاص الذين لهم تأثير على سلوكي في الوظيفة يعتقدون بأنني يجب أن أستخدم الخدمات الإلكترونية في إنجاز عملي. | 1 |
| 5 | 4 | 3 | 2 | 1 | الأشخاص الذين يهمني رأيهم يعتقدون أنني يجب أن أستخدم الخدمات الإلكترونية في إنجاز عملي. | 2 |

**4) الصورة (السمعة) Image (IM)**

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | في مكان عملي ... | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | الموظفون الذين يستخدمون نظام الخدمات الإلكترونية في أداء أعمالهم يتمتعون بصورة أفضل من زملائهم الذين لا يستخدمونه. | 1 |
| 5 | 4 | 3 | 2 | 1 | الموظفون الذين يستخدمون نظام الخدمات الإلكترونية في أداء أعمالهم يتمتعون بمكانة عالية مقارنة بنظرائهم الذين لايستخدمونه. | 2 |
| 5 | 4 | 3 | 2 | 1 | وجود نظام محوسب لإنجاز العمل يعتبر مصدر فخر. | 3 |
| 5 | 4 | 3 | 2 | 1 | تتحسن صورتي أمام الناس من خلال استخدامي لنظام الخدمات الإلكترونية في إنجاز مهامي الوظيفية. | 4 |

**5) الإرتباط بالوظيفة Job Relevance (JR)**

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | البند | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | إن استخدام نظام الخدمات الإلكترونية مهم في وظيفتي. | 1 |
| 5 | 4 | 3 | 2 | 1 | في وظيفتي نظام الخدمات الإلكترونية مرتبط بمهام عملي. | 2 |
| 5 | 4 | 3 | 2 | 1 | الأنظمة التي أستخدمها من الخدمات الإلكترونية صممت لمساعدتي في إنجاز مهامي الوظيفية. | 3 |

## 6) جودة النتائج Output Quality (OQ)

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | البنـــــود | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | النتائج التي أحصل عليها من استخدامي للخدمات الإلكترونية ذات جودة عالية. | 1 |
| 5 | 4 | 3 | 2 | 1 | جودة النتائج التي أحصل عليها من نظام الخدمات الإلكترونية مناسبة بالنسبة لإحتياجاتي في العمل . | 2 |
| 5 | 4 | 3 | 2 | 1 | المعلومات التي أحصل عليها من نظام الخدمات الإلكترونية تتمتع بدقة عالية. | 3 |

## 7) إثباتية النتائج Result Demonstrability (RD)

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | البنـــــود | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | من السهل لدي الحديث عن نتائج استخدامي لنظام الخدمات الإلكترونية في عملي . | 1 |
| 5 | 4 | 3 | 2 | 1 | أؤمن بأنني قادر على توضيح نتائج استخدام نظام الخدمات الإلكترونية في عملي للآخرين. | 2 |
| 5 | 4 | 3 | 2 | 1 | نتائج استخدامي لنظام الخدمات الإلكترونية في عملي واضحة بالنسبة لي. | 3 |
| 5 | 4 | 3 | 2 | 1 | من الممكن أن أجد صعوبة في شرح سبب كون نظام الخدمات الإلكترونية مفيداً في عملي. | 4 |

## 8) الرغبة في إستخدام نظام الخدمات الإلكترونية Intention to Use (IU)

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | البنـــــود | |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | أرغب باستخدام أي نظام محوسب ضمن الخدمات الإلكترونية في إنجاز عملي في حال إتاحته لي. | 1 |
| 5 | 4 | 3 | 2 | 1 | في حال إتاحة نظام محوسب لعملي ضمن الخدمات الإلكترونية فإنني أتوقع أن أقوم باستخدامه . | 2 |
| 5 | 4 | 3 | 2 | 1 | في حال كنت مخيراً باستخدام نظام الخدمات الإلكترونية فإنني سأقوم باستخدامه. | 3 |

# Appendix C: Email to distribute Electronic questionnaire

## Appendix D: Electronic Questionnaire through MoEHE Official Survey System

السلطة الوطنية الفلسطينية
وزارة التربية والتعليم العالي
الخدمات الإلكترونية

دراسة تأثير عدد من العوامل على تقبل الموظفين لنظام الخدمات الإلكترونية بوزارة التربية والتعليم العالي بقطاع غزة وتأثير ذلك على نجاح النظام

عزيزي الموظف،، يقوم الباحث بدراسة تأثير عدد من العوامل على تقبل الموظفين لنظام الخدمات الإلكترونية بوزارة التربية والتعليم العالي بقطاع غزة وتأثير ذلك على نجاح النظام، وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في إدارة الأعمال من الجامعة الإسلامية بغزة. ومن منطلق إيماننا بأنكم كعاملين بوزارة التربية والتعليم العالي تمتلكون من الخبرة والتجربة ما يجعلكم المصدر الأمثل للحصول على المعلومات المطلوبة بدقة وأمانة، فإننا نأمل منكم التكرم بتعبئة الإستبانة المرفقة باختيار الإجابات التي تعكس واقع العمل لديكم، مع التأكيد بأن المعلومات التي سيتم الحصول عليها ستستخدم فقط لأغراض البحث العلمي وسيتم التعامل معها بسرية تامة. شاكراً لكم حسن تعاونكم، ونقدر لكم جهدكم ووقتكم الثمين في تعبئة الإستبانة. الباحث: محمد زايد فارس برنامج ماجستير إدارة الأعمال – كلية التجارة الجامعة الإسلامية – بغزة

| | | بيانات عامة | |
|---|---|---|---|
| 1- الجنس | ✅ ذكر | أنثى | |
| 2- الحالة الاجتماعية | ✅ متزوج | أعزب | |
| 3- مكان العمل | ✅ الوزارة | مديرية غرب غزة | مديرية شرق غزة |
| | مديرية خانيونس | مديرية شمال غزة | مديرية الوسطى |
| | غير ذلك | مديرية شرق خانيونس | مديرية رفح |
| 4- العمر | أقل من 25 عاماً | ✅ 25 إلى أقل من 30 | 30 إلى أقل من 35 |
| | 40 إلى أقل من 45 | | 35 إلى أقل من 40 |
| | | 45 فأكثر | |
| 5- الدرجة العلمية | أقل من دبلوم | دبلوم (شهادة متوسطة) | بكالوريوس |
| | ✅ ماجستير | دكتوراه | |
| 6- المسمى الوظيفي | مدير عام | ✅ مدير دائرة | رئيس قسم |
| | | | رئيس شعبة |
| | موظف إداري | سكرتير | معلم |
| | غير ذلك | مشرف تربوي | |
| 7- سنوات | | | |

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| | | |
|---|---|---|
| الخبرة في الوظيفة الحالية | أقل من 5 سنوات | 5 إلى أقل من 10 سنوات | ✅ 10 إلى أقل من 15 سنة |
| | 15 إلى أقل من 20 سنة | 20 إلى أقل من 25 سنة | 25 سنة فأكثر |

| | | | |
|---|---|---|---|
| 8- نظم المعلومات التي تستخدمها | نظام الإدارة المدرسية | نظام الشؤون الإدارية | نظام الشؤون المالية |
| | نظام إدارة التدريب | ✅ نظام التخطيط التربوي | نظام إدارة اللوازم والعهد الكتب والمطبوعات |
| | المكتبات | المختبرات العلمية | الإشراف التربوي |
| | غير ذلك | | |

| | | |
|---|---|---|
| 9- استخدامك لنظم المعلومات في عملك يتم بشكل | اختياري | ✅ إجباري |

## أولا: المنفعة المدركة لنظام الخدمات الإلكترونية Perceived Usefulness (PU)

**إن استخدام نظام الخدمات الإلكترونية في مكان عملي ...**

| | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 10- يحسن من أدائي الوظيفي. | | ✅ | | | |
| 11- يزيد من إنتاجيتي في عملي. | ✅ | | | | |
| 12- يحسن من فاعليتي في وظيفتي. | | ✅ | | | |
| 13- يفيدني في أداء مهامي الوظيفية. | ✅ | | | | |

## ثانيا: سهولة الاستخدام المدركة لنظام الخدمات الإلكترونية Perceived Ease of Use (PEOU)

| | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 14- أجد أن التعامل مع الخدمات الإلكترونية في عملي واضح ومفهوم. | ✅ | | | | |
| 15- التفاعل مع نظام الخدمات الإلكترونية في مكان عملي لا يتطلب الكثير من الجهد العقلي. | | ✅ | | | |
| 16- أجد أن نظام الخدمات الإلكترونية سهل الاستخدام. | ✅ | | | | |
| 17- أجد أنه من السهل أن أجعل نظام الخدمات الإلكترونية يؤدي ما أود منه تأديته في عملي. | | ✅ | | | |

## ثالثا: السلوك الشخصي Subjective Norm (SN)

**في مكان عملي ...**

| | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 18- الأشخاص الذين لهم تأثير على سلوكي في الوظيفة يعتقدون بأنني يجب أن أستخدم الخدمات الإلكترونية في إنجاز عملي. | ✅ | | | | |

| العبارة | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 19- الأشخاص الذين يهمني رأيهم يعتقدون أنني يجب أن أستخدم الخدمات الإلكترونية في إنجاز عملي. | ✅ | | | | |

## رابعا: الصورة (السمعة) Image (PU)

**في مكان عملي ...**

| العبارة | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 20- الموظفون الذين يستخدمون نظام الخدمات الإلكترونية في أداء أعمالهم يتمتعون بصورة أفضل من زملائهم الذين لا يستخدمونه. | ✅ | | | | |
| 21- الموظفون الذين يستخدمون نظام الخدمات الإلكترونية في أداء أعمالهم يتمتعون بمكانة عالية مقارنة بنظرائهم الذين لا يستخدمونه. | | ✅ | | | |
| 22- وجود نظام محوسب لإنجاز العمل يعتبر مصدر فخر. | ✅ | | | | |
| 23- تتحسن صورتي أمام الناس من خلال استخدامي لنظام الخدمات الإلكترونية في إنجاز مهامي الوظيفية. | ✅ | | | | |

## خامسا: الارتباط بالوظيفة (Job Relevance (JR

| العبارة | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 24- إن استخدام نظام الخدمات الإلكترونية مهم في وظيفتي. | | ✅ | | | |
| 25- في وظيفتي نظام الخدمات الإلكترونية مرتبط بمهام عملي. | | ✅ | | | |
| 26- الأنظمة التي أستخدمها من الخدمات الإلكترونية صممت لمساعدتي في إنجاز مهامي الوظيفية. | | ✅ | | | |

## سادسا: جودة النتائج (Output Quality (OQ

| العبارة | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 27- النتائج التي أحصل عليها من استخدامي للخدمات الإلكترونية ذات جودة عالية. | | ✅ | | | |
| 28- جودة النتائج التي أحصل عليها من نظام الخدمات الإلكترونية مناسبة بالنسبة لاحتياجاتي في العمل. | | ✅ | | | |
| 29- المعلومات التي أحصل عليها من نظام الخدمات الإلكترونية تتمتع بدقة عالية. | | ✅ | | | |

## سابعا: إثباتية النتائج (Result Demonstrability (RD

| العبارة | أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة |
|---|---|---|---|---|---|
| 30- من السهل لدي الحديث عن نتائج استخدامي لنظام الخدمات الإلكترونية في عملي. | ✅ | | | | |
| 31- أؤمن بأنني قادر على توضيح نتائج استخدام نظام الخدمات الإلكترونية في عملي للآخرين. | | ✅ | | | |
| 32- نتائج استخدامي لنظام الخدمات الإلكترونية في عملي واضحة بالنسبة لي. | | ✅ | | | |
| 33- من الممكن أن أجد صعوبة في شرح سبب كون نظام الخدمات الإلكترونية مفيداً في عملي. | | | ✅ | | |

| أوافق بشدة | أوافق | محايد | لا أوافق | لا أوافق بشدة | ثامنا: الرغبة في إستخدام نظام الخدمات الإلكترونية (IU) Intention to Use |
|---|---|---|---|---|---|
| ✅ | | | | | 34- أرغب باستخدام أي نظام محوسب ضمن الخدمات الإلكترونية في إنجاز عملي في حال إتاحته لي. |
| ✅ | | | | | 35- في حال إتاحة نظام محوسب لعملي ضمن الخدمات الإلكترونية فإنني أتوقع أن أقوم باستخدامه. |
| ✅ | | | | | 36- في حال كنت مخيراً باستخدام نظام الخدمات الإلكترونية فإنني سأقوم باستخدامه. |

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