The Effect of ERP System Implementation on the Aspects of Service Quality: An empirical study on the Egyptian Telecommunications Sector
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Abstract

The goal of this research is to explore the effect of the ERP system implementation on some aspects of service quality in the Egyptian telecommunications organizations. The results of the research implied that there is significant impact of ERP system implementation on some aspects of service quality model that include tangible aspects of service, reliability and assurance.

Keywords:
Enterprise Resources Planning, Service quality, Critical Success Factors, Tangible Aspects, Reliability and Assurance

ملخص البحث:
تهدف هذه الدراسة إلى اكتشاف أثر تطبيق نظام تخطيط موارد المشروع على بعض عناصر جودة الخدمة في شركات الاتصالات المصرية. وتوصلت الدراسة إلى وجود علاقة ذات دلالة إحصائية لتطبيق نظام تخطيط موارد المشروع وبعض عناصر جودة الخدمة المتمثلة في الجوانب الملموسة للخدمة والاعتمادية وتأكيد جودة الخدمة.

مفتاح الكلمات:

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Introduction

The successful implementation of ERP system in the telecom sector as a management tool requires deep understanding of the factors that contribute to that success. It is noted that there is a debate in the literature regarding to determining The ERP implementational success factors and the consequences associated with that successful implementation.

Also, there might be a potential barrier before, during and after the implementation process that should be taken into consideration when studying ERP in Egypt and particularly in the telecommunications sector. There is an absence of a theoretical framework that could explain the experience of ERP implementation in the telecommunications companies in Egypt. Also, the consequences of the successful implementation of the ERP system is still controversial because of the different results of many studies that have tried to investigate the impact of different factors on different business aspects including the quality dimensions. This study is empirically exploring some of ERP implementational factors in the telecommunications sector in Egypt, identifying the service quality dimensions as well in an attempt to fill the gap in the little knowledge that exists concerning the effect of ERP system implementational factors on the service quality dimensions in the telecom sector in Egypt using the service quality model.

The Theoretical framework of Research

In this part of research, the inductive approach will be implemented by presenting the main terminologies and concepts of the study and reviewing the literature and the related previous studies.
Terminologies and basic concepts:
This part presents the main concepts that is used in the study as follows:

**ERP system**
According to El Masbahi and Semma, (2013, p.99), ERP can be defined as a system for managing the company’s resources (financial, material, and human) using a software package through focusing on consistency of information & communication between different business actors.

**Critical success factors**
Giving special and continual attention to specific elements in the management or enterprise area in order to achieve high performance & ensure the success of an organization (Boynlon, A.C., and Zmud, R.W. 1984, p.3)

**Quality of Service**
Parasuraman et al., (1988, p.199) have defined service quality as the difference between perceptions and expectations of performance.

**Service quality dimensions:**
Lehtinen and Lehtinen (1982) have divided service quality into ten dimensions that are used by the customers to evaluate the service quality. These dimensions are: tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding/knowing the customer, and access. Then the ten items were revised into specific dimensions such as:
- **Tangible aspects of service quality:** (the physical elements of service such as uniform of personnel, instruments and physical facilities).
- **Reliability of service quality:** (the ability to perform the committed service dependably and accurately).
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Assurance of service quality: (the ability to inspire confidence, awareness, understanding and friendliness of employees).

Previous Studies

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Researcher</th>
<th>Y Year</th>
<th>Aim and Application</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Service Quality Gaps in Cellular Telecommunication Service Providers (A study with reference to – Andhra Pradesh)</td>
<td>Kumar, V., Kolla, N., and Adinarayana</td>
<td>2014</td>
<td>This study is applied on 412 of cellular telecommunications service providers in India</td>
<td>The study indicated that cellular telecom competition was mainly based on service quality so in winning competition they need to consider the service quality gaps &amp; all dimensions have service quality gaps but it was serious in responsiveness followed by assurance, tangibles, empathy and reliability.</td>
</tr>
<tr>
<td>No.</td>
<td>Topic</td>
<td>Author</td>
<td>Year</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-----</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Priority of Key Success Factors (KSFS) on Enterprise Resource Planning (ERP) System Implementation Life Cycle</td>
<td>Hasibuan, Z., and Dantes, G.</td>
<td>2012</td>
<td>This study is applied on 74 companies that apply the ERP system from 37 companies representing 10 different industrial sectors. The study aims to determine the critical success factors from twenty factors selected from the ERP literature based on a proposed five ERP’s life cycle: Project Preparation, technology selection, project formulation Stage, implementation and development Stage. The study showed that the success of the ERP system implementation can be measured through five indicators: system quality, information quality, service quality, tactical impact &amp; strategic impact. Also, the study revealed that comm. was the most critical success factor at project preparation stage while the strong ERP product (package selection) is the most critical success factor on technology selection stage, the change management is the most critical success factor on project formulation stage, while user training is the most critical in the implementation /development stage.</td>
<td></td>
</tr>
</tbody>
</table>
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Statement of the Problem
The research problem can be summarized into the following question:

1. What is the impact of ERP system critical success factors on service quality dimensions in the Egyptian telecommunications organizations?

The previous question is divided into the following:

1.1 What is the impact of ERP system critical success factors on tangible aspects of service quality in the Egyptian telecommunications organizations?
1.2 What is the impact of ERP system critical success factors on reliability of service quality in the Egyptian telecommunications organizations?
1.3 What is the impact of ERP system critical success factors on assurance of service quality in the Egyptian telecommunications organizations?

Research Methodology:
There is an absence of theory that can define the relationship between the ERP implementation and service quality in this research, therefore, the researcher is trying to explore this type of relationship to reach or build a theory and this could be attained through implementing an inductive approach using research questions by moving from the specific to general then using deductive approach to identify the ERP implementational critical success factors in the Egyptian telecommunications sectors and exploring the impact of these factors on some dimensions of SERVQUAL model.
Research Variables
In this research, there are two main variables that are divided into dependent and independent variables as follows:
1. The ERP implementational critical success factors that are divided into three categories: organizational, human and technological factors which represent the independent variables.
2. The Service Quality Dimensions: empathy, responsiveness and results of service quality which represent the dependent variables.

Research hypotheses
The following hypotheses have been developed in order to explore if there is a significant relationship between the ERP implementation and the quality of the service in the Egyptian Telecommunications sector:

H1: There is a significant impact of ERP system critical success factors on service quality dimensions in the Egyptian telecommunications organizations.
H1.1 There is a significant impact of ERP system critical success factors on tangible aspects of service quality in the Egyptian telecommunications organizations.
H1.2 There is a significant impact of ERP system critical success factors on reliability of service quality in the Egyptian telecommunications organizations.
H1.3 There is a significant impact of ERP system critical success factors on assurance of service quality in the Egyptian telecommunications organizations.
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Research Population and Sampling

The four Egyptian telecommunications organizations working in the telecommunications industry in Egypt are: Vodafone- Orange (Mobinil) - Etisalat and Telecom Egypt represent the population of the study. The first three organizations belong to the private sector while the last one is a shareholding organization.

The reason behind choosing the telecom sector is the extensive use of information technology, particularly, the ERP systems compared to some other Egyptian manufacturing and service sectors. The adoption of the updated IT and the ICT infrastructure plays a vital role in ERP implementation in large organizations and that relies on ERP systems as their backbone infrastructure for their functionalities (Abdelghaffar and Abdel Azim, 2010) which could be found in the telecom sector. from five-point Likert scale.

Two samples were drawn from the previous four service providers. The first has been drawn from the employees who use the ERP system in the four organizations. The second represents the customers who use the telecom services such as mobile calls and the internet. The number of the ERP users and customers in the four telecom operators was determined according to:

- The Annual Report of Egyptian telecom and IT sector indicators in 2014 that was issued by Ministry of Communication and Information Technology (MCIT).
- The Mobile QoS Monthly Report in 2016 issued by the National Telecom Regulatory Authority (NTRA)
The official websites of the four telecom operators in 2017:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>No. of Employees</th>
<th>No. of customers (in million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodafone</td>
<td>9000</td>
<td>39.54</td>
</tr>
<tr>
<td>Etisalat</td>
<td>3000</td>
<td>22</td>
</tr>
<tr>
<td>Orange (Mobinil)</td>
<td>2000</td>
<td>33.7</td>
</tr>
<tr>
<td>Telecom Egypt</td>
<td>10000</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>24000</td>
<td>106.24</td>
</tr>
</tbody>
</table>

Table (2): The telecom operator’s employees and customers

According to Alsayed & Mostafa (2003), the mathematical equations are used to calculate the sample size are as follows:

A- Employees’ sample size

\[ n = \frac{N}{(N - 1) e^2 + 1} \]

Where: \( n \): sample size \( N \): Population size \( e \): level of accepted error

\[ n = \frac{24000}{(24000 - 1)(0.05)^2 + 1} \]

\( n = 393 \) number of respondents 707

B- Customers’ sample size: (Alsayed & Mostafa 2003)

\[ n = \frac{106.24\text{ million}}{(106.24\text{ million} - 1)(0.05)^2 + 1} \]

\( n = 400 \)

number of respondents = 2880

**Research Limitations**

This study is implemented under a group of limitations as follows:

1. The study has application limitations including:
This study is limited to the application of the ERP system in the service sector and particularly in the telecommunications industry in Egypt.

The service quality evaluations in this study is limited to some of the dimensions of SEVQUAL model.

2. The study has a time limitation by which the data are collected at specific point of time as the data is collect through cross-section research design.

3. The study is geographically limited to specific areas including: Cairo, Giza, 6th of October City (smart village), Mansoura, Behera, El Mahalla El Kubra, Alexandria, Minya, Sohag and Damietta.

**Literature Review**

**Historical Evolution of ERP system**

According Nazemi, E., Tarokh, M., & Djavanshir, G., (2012), “ERP: A literature survey, International Journal of Advanced Manufacturing Technology, London, pp. 999-1018, The Material Requirement Planning (MRP) and the Manufacturing Resource Planning MRP II systems of the 1970s and 1980s respectively were the origin of ERP. In Egypt, the military sector was the first sector in Egypt that has implemented the Material Requirement Planning (MRP) system in 1970’s then followed by the implementation of the Manufacturing Resource Planning (MRPII) in the same sector (Rasmy, Tharwat, and Elsawah, 2005). After that, the multinational vendors including Oracle & SAP started to present the ERP to the Egyptian market in 1990’s (Oracle & SAP). According to McGaughey and Gunasekaran, (2009), the evolutionary history of ERP and related systems are as follows:
<table>
<thead>
<tr>
<th>System</th>
<th>Primary business need(s)</th>
<th>Scope</th>
<th>Enabling technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRP</td>
<td>Efficiency</td>
<td>Inventory Mgt. and prod. planning and control.</td>
<td>Mainframe computers, batch processing, traditional file systems.</td>
</tr>
<tr>
<td>MRP1</td>
<td>Efficiency, effectiveness and integration of manufacturing systems</td>
<td>Extending to the entire manufacturing firm (becoming cross functional)</td>
<td>Mainframe and mini computers, real-time (time sharing) processing, database management systems (relational)</td>
</tr>
<tr>
<td>ERP</td>
<td>Efficiency (primarily back office), effectiveness and integration of all organizational systems.</td>
<td>Entire organization (increasingly cross functional), including manufacturing operations</td>
<td>Mainframe, mini and macro computers, mainframe networks with distributed processing and databases, data warehousing and mining knowledge management</td>
</tr>
<tr>
<td>ERP1</td>
<td>Efficiency, effectiveness and integration within and among enterprises.</td>
<td>Entire org. extending to other org. (cross function and cross enterprise – partners, suppliers, etc.)</td>
<td>Mainframes, client server systems, distributed computing, knowledge management, internet technology (includes web service, intranets and extranets)</td>
</tr>
</tbody>
</table>


But Gore, (2008, p.37), provided that ERP can be distinguished further as first, second and third generation based on the methodologies to support the ERP systems implementation that remain vital as follows:
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<table>
<thead>
<tr>
<th>Particulars</th>
<th>First Generation ERP</th>
<th>Second Generation ERP</th>
<th>Third Generation ERP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>Single company</td>
<td>Single company</td>
<td>Multiple companies</td>
</tr>
<tr>
<td><strong>No. of Sites</strong></td>
<td>Single</td>
<td>Multiple</td>
<td>Multiple sites from different companies</td>
</tr>
<tr>
<td><strong>Methodology Focus</strong></td>
<td>Streamline business processes</td>
<td>Global integration of enterprise</td>
<td>Integration of supply chain</td>
</tr>
<tr>
<td><strong>Technology Focus</strong></td>
<td>Business process efficiency</td>
<td>Interoperability across the globe</td>
<td>Interoperability across platforms</td>
</tr>
<tr>
<td><strong>Organization Focus</strong></td>
<td>Business process</td>
<td>Seamless integration across multiple sites</td>
<td>Product/Market channel</td>
</tr>
<tr>
<td><strong>Process Focus</strong></td>
<td>Enterprise- wide closed loop</td>
<td>Global enterprise-wide closed loop</td>
<td>E-business, SCM, CRM loop</td>
</tr>
</tbody>
</table>


**Implementation of the ERP system**

The number of ERP modules in some ERP system vendors such as Odoo could be reached to 300 modules. But there are basic ERP modules that are essentially implemented by the large ERP providers, these modules are: HR, accounting, finance, inventory, marketing, sales & operations.
Yeh, Yang and Lin (2007, p.848) conclude that there are many ERP modules such as a customer relationship management module, supply chain management module; an applied technology module; an enterprise strategy module; a financial accounting module; a financial control module; a project management module; a quality management module; a production planning/control module; a personnel/human resources module; a materials management module; a sales management module.

Erasmus & Daneva (2015, p.129) used the QFD (quality function deployment) approach for ERP design and implementation by establishing the architecture of the ERP system on the relationship between the QR (Quality Requirements) (Kazman et al, 1998, p.127) and FR (Functional Requirements) & raking the quality requirements (prioritized qualities) that the end user & customer require in a four stage process that include: customer requirements, scope formulation, estimation and validation, then adopt and customize the ERP architecture in such a way that meets the technical needs and the prioritized qualities.

**ERP Critical Success Factors of Implementation**

In ERP literature, a group of critical success factors exist and this research will follow the framework proposed by Salaheldin, (1998) in classifying the success factors of MRP into: organizational, technological and human factors as follows:

**A. Organizational critical success factors**

1. **Vision, Goals, Objectives and Business Plan**

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2. **Change Management**

3. **Coordination, Cooperation and Cross-Functional Cooperation**

4. **Time, Cost of Implementation, Project Justification Based on Cost and Economic Scale**

5. **Culture, Communication, Support and Empowerment**

6. **Project Management**

7. **Stakeholder’s Management and Communication**
   (Akkermans, H., and van Helden, K. 2002, p.1)

8. **Improved Work Efficiency**
   (Arabi, M., Saman, M., Wong, K., Beheshti, H., Za-kuan, N., 2011, p.156)

9. **Implementation Strategy and Time Frame**
   (Gandhi, A., 2015, p. 42), (Bhagwani, A., 2009, p.17)
10. Business Process Re-engineering


B. Human critical success factors

1. Support from Top Management

(Al-Fawaz, K., Al-Salti Z., and Eldabi, T.,2008), (Finney, Sherry, Corbett, and Martin, 2007, p.335),

2. User’s knowledge


3. Employee Moral

(Ganesh, Mehta and Arpita, 2010, p.76), (Belkhamza, Z., and Wafaa, S. 2012, p.213)

4. Training, Education and Job Redesign

(Finney, Sherry, Corbett, and Martin, 2007, p.88), (Swaminathan, S., 2011, p.67)

5. User’s Involvement


6. Employee’s Attitude and Project Team


7. Communication Plan.

C. Technological critical success Factors

1. Organization Fit with ERP Package  
   (Moller, C., and Chaudhry S., 2012, pp.48)

2. ERP System Configuration  

3. IT Infrastructure  

4. Compatibility  
   (El meziane, K., Chuanmin, S., and El meziane, M., 2011, p.6).

5. Legacy Systems  


7. IT maturity and Computer culture.  
   (Supramaniam, M. and Kuppusamy, M., 2011, p.371)

8. ERP Complexity (Frimpon, M., 2012, p.233)

9. The Selection of the Appropriate ERP Package  
   (ALdayel, A., Aldayel, M., and Al Mudimigh A., 2011, p.8)
Service Quality

Service Quality Models

There are many models that exist in literature to measure the quality of service. Generally, some of these models work as a commencement for other models. There are many factors that influence the selection of the appropriate model to measure the service quality such as the cost of implementation. The following are examples of service quality models: SERVQUAL Model, The Gaps Model of Service Quality, SERVBERF Model, Swan and Combs (1976) Model, Lehtinen & Lehtinen 1982 Model, Grönroos (1984) Model and Multilevel Model.

**SERVQUAL Model**

SERVQUAL model has been developed by A. Parasuraman, Valarie Zeithaml & Leonard Berry in 1985 (Parasuraman, Zeithaml, and Berry, 1988) when they have performed an extensive qualitative study along with the handful work of some researchers such as (Sasser, Olsen, Wyckoff 1978; Gronroos 1982; Lehtinen and Lehtinen 1982) and concluded ten dimensions (tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding/knowing the customer, and access) that are used by the customers in order to evaluate the service quality, those ten items were revised into specific five dimensions as follows:

- **Tangibles:** the physical elements of the service such as the uniform of personnel, instruments and physical facilities.
- **Reliability:** the ability to perform the committed service dependably and accurately.
- **Responsiveness:** providing instant service and the willingness to assist customers.
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- Assurance: the ability to inspire confidence, awareness, understanding and friendliness of employees.
- Empathy: the firm provides concern and personal attentiveness to its customers.

**Hypotheses Testing**

In order to test the research hypothesis, a group of sub-hypotheses are emerged from the main hypothesis will be tested as follows:

**H1.1: There is a significant impact of ERP system critical success factors on tangible aspects of the service quality in the Egyptian telecommunications organizations.**

In order to test the previous hypothesis, the multiple regression analysis is used as shown in the following table:

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Unstandardized Coefficient B</th>
<th>Standardized Coefficients Beta</th>
<th>T- Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological Factors</td>
<td>0.720</td>
<td>0.706</td>
<td>19.866</td>
</tr>
<tr>
<td>Organizational Factors</td>
<td>0.149</td>
<td>0.133</td>
<td>2.947</td>
</tr>
<tr>
<td>Human Factors</td>
<td>0.092</td>
<td>0.080</td>
<td>2.234</td>
</tr>
</tbody>
</table>

\[ F = 905.994 \]

\[ \text{Sig} \]

\[ R^2 = 0.795 \]

\[ R = 0.891 \]

Table (5): regression weights for H1.1
From the previous table, it is concluded that:

The explanatory power of the model

The value of coefficient of determination ($R^2$) is 0.795, indicating that the independent variable ERP critical success factors (human, organizational and technological) is explaining 79% of the variance in the dependent variable (tangible aspects of the service quality) in the studied companies.

Significance of regression model

The value of correlation coefficient ($R$) is (0.89), indicating a strong correlation between combined independent variables and the dependent variable in the companies’ understudy.

The result of the F-test refers to the significance of the multiple regression model as the level of significance is below (0.05), accordingly, at least one of the independent variables has a significant impact on the dependent variable.

Significance of independent variables

The unstandardized coefficients $B$ values of independent variables clarify that:

• The $B$ value of the independent variable (technological factors) is (0.720) indicating a positive relationship between this variable and the dependent variable (tangible aspects). The result of the $T$-test indicates a significant relationship and a significant impact of the independent variable, as the significance level is below (0.05), accordingly, the alternative hypothesis is accepted which provides
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that: “There is a significant impact of the ERP critical success factors on tangible aspects of the service quality”.

• The B value of the independent variable (organizational factors) is (0.149), indicating a positive relationship exists between this variable and the dependent variable (tangible aspects). The result of the T-test indicates a significant relationship and a significant impact of the independent variable as the level of significance is below (0.05), consequently, the alternative hypothesis is accepted which claims that: “There is a significant impact of ERP critical success factors on tangible aspects of the service quality”.

• The B value of the independent variable (human factors) is 0.092 indicating a positive relationship exists between this variable and the dependent variable (tangible aspects). The result of the T-test indicates a significant relationship and a significant impact of independent variable at significance level below (0.05), and accordingly, the alternative hypothesis is accepted which provides: “There is a significant impact of ERP critical success factors on tangible aspects of the service quality”.

• According to the values of Beta Coefficients, the independent variables can be sorted based on the relative importance as follows:

  - Technological Factors (B=0.706)
  - Organizational Factor (B=0.133)
  - Human Factors (B=0.080)

H1.2 There is a significant impact of ERP system critical success factors on reliability of service quality in the Egyptian telecommunications organizations.

In order to test the previous hypothesis, the multiple regression analysis is used as shown in the following table:
Table (6): regression weights for H1.2

From the previous table, it is concluded that:

The explanatory power of the model

The value of coefficient of determination ($R^2$) is (0.753), clarifying that the independent variable ERP critical success factors (human, organizational & technological factors) are explaining 75% of the variance in the dependent variable (reliability of the service quality).

Significance of regression model

The value of correlation coefficient ($R$) is (0.868), indicating a strong correlation exists between combined independent variables and the dependent variable.
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The result of the F-test refers to the significance of the Multiple Regression Model as the significance level is below (0.05) and accordingly, at least one of the independent variables has a significant impact on the dependent variable.

Significance of independent variables

The unstandardized coefficients B values of independent variables clarify that:

• The B value of the independent variable (technological factors) is (0.592), indicating a positive relationship between this variable and the dependent variable (reliability of service quality). The result of the T-test indicates a significant relationship and a significant impact of the independent variable, as the level of significance is below (0.05), Accordingly, the alternative hypothesis is accepted which provides: “There is a significant impact of ERP critical success factors on reliability of service quality”

• The B value of the independent variable (human factors) is (0.206), indicating a positive relationship exists between this variable and the dependent variable (reliability of service quality). The result of the T-test indicates a significant relationship and a significant impact of the independent variable as the level of significance is below (0.05), and consequently, the alternative hypothesis is accepted which provides that: “There is a significant impact of ERP critical success factors on reliability of service quality”

• The B value of the independent variable (organizational factors) is (0.144), indicating a positive relationship exists between this variable & the dependent variable (reliability of service quality). The result of the T-test indicates a significant relationship and a
significant impact of the independent variable, with a significance level below (0.05), consequently, the alternative hypothesis is accepted which provides: “There is a significant impact of ERP critical success factors on reliability of service quality”

- According to the values of Beta Coefficients, the independent variables can be sorted based on the relative importance as follows:
  - Technological Factors (B= 0.594)
  - Human Factors (B=0.182)
  - Organizational Factors (B=0.131)

**H1.3 There is a significant impact of ERP system critical success factors on assurance of service quality in the Egyptian telecommunications organizations.**

In order to test the previous hypothesis, the multiple regression analysis is used as shown in the following table:

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Unstandardized Coefficients B</th>
<th>Standardized Coefficients Beta</th>
<th>T- Test</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological Factors</td>
<td>0.563</td>
<td>0.562</td>
<td>12.400</td>
<td>0.000</td>
</tr>
<tr>
<td>Human Factors</td>
<td>0.220</td>
<td>0.194</td>
<td>4.262</td>
<td>0.000</td>
</tr>
<tr>
<td>Organizational Factors</td>
<td>0.108</td>
<td>0.099</td>
<td>1.709</td>
<td>0.088</td>
</tr>
<tr>
<td><em>F</em></td>
<td></td>
<td></td>
<td>466.810</td>
<td>0.000</td>
</tr>
<tr>
<td><em>Sig</em></td>
<td></td>
<td></td>
<td>0.666</td>
<td>0.816</td>
</tr>
</tbody>
</table>

Table (7): regression weights for H1.3
From the previous table, it is concluded that:

The explanatory power of the model

The value of coefficient of determination ($R^2$) is (0.666), clarifying that the independent variable ERP critical success factor (human, organizational & technological factors) are explaining 66% of the variance in the dependent variable (the assurance of service quality).

Significance of the regression model

The value of correlation coefficient (R) is (0.816), indicating a strong correlation between the combined independent variables & the dependent variable.

The result of the F-Test refers to the significance of the multiple regression model as the significance level is below (0.05), accordingly, at least one of the independent variables has a significant impact on the dependent variable.

The Significance of the Independent Variables

The Unstandardized Coefficients B values of the independent variables indicating that:

- The B value of the independent variable (technological Factors) is (0.563), indicating a positive relationship exists between this variable & the dependent variable (assurance of service quality).
  The result of the T-Test indicates a significant relationship and a
significant impact of the independent variable, as the significance level is below (0.05), Accordingly, the alternative hypothesis is accepted providing that: “There is a significant impact of ERP critical success factors on assurance of service quality”

• The B value of the independent variable (organizational factors) is (0.108), indicating a positive relationship exists between this variable and the dependent variable (assurance of service quality). The result of the T-Test indicates a significant relationship & a significant impact of the independent variable as the level of significance is below (0.05), accordingly, the alternative hypothesis is accepted provide that: “There is a significant impact of ERP critical success factors on assurance of service quality”.

• The B value of the independent variable ERP critical success factor (Human Factors) is (0.092) indicating a positive relationship exists between this variable and the dependent variable (assurance of service quality). The result of the T-Test indicates a significant relationship and a significant impact of the independent variable as the level of significance is below (0.05), accordingly, the alternative hypothesis is accepted which provides: “There is a significant impact of ERP critical success factors on assurance of service quality”.

• According to the values of Beta Coefficients, the independent variables can be sorted due to their relative importance as follows:
  • Technological Factors (B= 0.562)
  • Human Factors (B=0.149)
  • Organizational Factors (B=0.099)
Recommended Future Researches

- Other studies can address other critical success factors listed in the ERP literature such as stakeholders’ management.
- The implementation of ERP system in other less developed countries.
- The impact of the next generations of the Enterprise Resources Planning to include ERPII and ERP III on service quality.
References


The Effect of ERP System Implementation on Aspects of Service Quality: An empirical study on the Egyptian Telecommunications Sector

Cotteleer, M. J. (2001) “Operational performances following ERP implementation”, Graduate School of Business Administration, Harvard University, USA, Ph.D. Thesis


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The study questionnaire

Company Name:

Kindly place a checkmark in front of the sentence that expresses your point of view with respect to the following terms:

**First: Enterprise Resources Planning**

The followings are the success factors of ERP implementation. To what extent these factors are important for such an implementation in the company to which you are belonging:

<table>
<thead>
<tr>
<th>The success factors of ERP implementation</th>
<th>Very Important</th>
<th>Important</th>
<th>Neutral</th>
<th>Not Important</th>
<th>Not Important at all</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A-The Human Factors</strong></td>
<td></td>
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<tr>
<td>1- User’s knowledge and familiarity of the ERP system</td>
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<td>2- User’s training &amp; Education &amp; Job redesign</td>
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<td>3- User’s participation in ERP application</td>
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<td>4- User’s attitude towards ERP</td>
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<tr>
<td>5-</td>
<td>User’s</td>
<td>Commitments to</td>
<td>business Ethics</td>
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<td>6-</td>
<td>Top management</td>
<td>Support to the ERP</td>
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<td>7-</td>
<td>Effective Project</td>
<td>Management &amp;</td>
<td>teamworking</td>
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<tr>
<td>B</td>
<td>-Organizational Factors</td>
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<tr>
<td>8-</td>
<td>Improving work</td>
<td>efficiency</td>
<td></td>
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<td>9-</td>
<td>The Implementation</td>
<td>Strategy &amp; time frame</td>
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<td>10-</td>
<td>Organization’s</td>
<td>Business Process</td>
<td>reengineering</td>
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<td>11-</td>
<td>Change</td>
<td>Management</td>
<td></td>
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<tr>
<td>12-</td>
<td>Coordination &amp;</td>
<td>Cooperation</td>
<td>between Cross</td>
<td>functional teams</td>
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<tr>
<td>13-</td>
<td>Cost of ERP</td>
<td>implementation</td>
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<td>14-</td>
<td>Stakeholders</td>
<td>management &amp;</td>
<td>communication</td>
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<td>15-</td>
<td>Culture Change</td>
<td>&amp; user’s empowerment</td>
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</table>
The Effect of ERP System Implementation on Aspects of Service Quality: An empirical study on the Egyptian Telecommunications Sector

C- Technological Factors

16- Organization’s vision & objectives

17- The selection of the appropriate ERP software package

18- The system modification during implementation

19- The selection of the appropriate ERP consultants

20- The system integration with other systems in the organization

21- Organization fit to the ERP package

22- The IT infrastructure in the organization

23- The Organization’s Culture that supports Technology

24- ERP complexity

25- The Legacy System

26- The Accuracy of used data
**Second: Service Quality**

The Following are some of the important dimensions of service quality evaluation. To what extent these dimensions are applied in the company to which you are belonging to:

<table>
<thead>
<tr>
<th>Service Quality Dimensions</th>
<th>Totally Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Totally Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>A- The Tangible Aspects of the Service</td>
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<tr>
<td>1- The customer service centers use modern looking equipment</td>
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<td>2- The physical facilities at customer service center are visually appealing</td>
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<td>3- Employees at customer service centers are neat appealing</td>
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<td>4- The customer service facilities support the delivered services</td>
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<tr>
<td>B- Reliability</td>
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<td>5- When the company promises to do something by a certain time, it fulfills it</td>
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<tr>
<td>6- Customer’s problems are solved sympathetically and logically</td>
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<td>7- The company provides its service at the time it promises to do so</td>
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<td>8- The company keeps accurate service records</td>
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**D- Assurance**

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<tbody>
<tr>
<td>13- Customer’s confidence increases in customer service agent</td>
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<tr>
<td>14- Customers feel safe when dealing with customer service agent</td>
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<td>15- Customer Service Agents are consistently courteous with customers</td>
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<td>16- The customer service agent receives appropriate support to perform competent service</td>
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</table>