

## Enhancing Technological Capability of Telecommunications Sector in Yemen: A Technology Adoption Approach

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### Abstract

The issue of technological capability on competitiveness of a company has long been discussed in the literature. Recently, researchers especially in Yemen are more interested to study about technology adoption due to global development in various fields. The adoption of technology in organizations directly contribute to improve the technological capability of a company; which contribute towards the organizational performance. Organizational performance can be translated into higher productivity, efficiency, and profitability. In this study, the authors adopted a technological, organizational, and people model to evaluate the technological capability of the firm. The study, identify the relationship between technology factors, organizational factors, and people factors with perceived usefulness and user satisfaction towards enhancing the organizational performance. The questionnaire used to collect primary data. The result of 104 usable responses were analyzed with Pearson correlation. The study indicates that there are positive correlation relationship between technological, organizational, and people factors with perceived usefulness and user satisfaction towards improving the organizational performance.

**Keywords:** Technological Capability, TOP Model, Technology Adoption, Organizational Performance.

### 1. Introduction

The use of the technology has become necessary for any organization to enhance the technological capability. Organizations invest in information technology and systems because for capability advantages. These technologies contribute to the enhancing of economic value to the business (Al-Mamary et al ,2015b).

The majority of Arab countries specially in Yemen are still dealing with issues in successful adoption of technologies. This study helps managers and policy makers in Arab countries to identify the factors that impact on successful adoption of technologies in the organization (Al-Mamary et al ,2015a).

This study is designed to identify the factors that effect on successful adoption of the technology in Yemen organizations. Terms that identify the factors accurately, will have positive role on successful adoption of technology in Yemeni organizations in general (improved labor productivity, improved the management of my work, reduces costs., helped to meet customer needs, providing the information without any delays and mistakes, and increases customer service/satisfaction) thus, the revenues of these companies will increase and will have a positive role in improving the country's economy.

### 2. Theories in Information Systems (IS) Into Context

There are many theories in field of information systems success, technology adoption, and computer usage such as : technology acceptance model, IS success model, computer usage model, personal computing acceptance model.

Technology acceptance model developed by Davis (1989). TAM identifies two main variables for the successful adoption of a technology, and these variables are perceived usefulness, and ease of use. The model mainly focuses on the technical side. The acceptance of the technology in some cases need the support from top management to encourage the end user to accept the technology or more need training or self-efficacy. In a conclusion , there are several aspects to be considered to encourage the end-user to accept a technology.

Another model is Delone and Mclean IS success model (1992) identifies six variables for the successful adoption

of information systems, and these variables are (system quality, information quality, use, user satisfaction, individual impact, and organizational impact). The independent variables in the model focuses on the technical side. Delone and Mclean (2003) added the service quality as a factor independently. It was merged with two variables (individual impact and organizational impact) to net benefits. Despite the updated, the model is still focused on the technical factors.

The third model, computer usage model developed by Igbaria & livari (1995). This model identifies seven variables for system usage, and these variables are (computer experience, organizational support, self-efficacy, computer anxiety, perceived ease of use, perceived usefulness, and system usage). It propose that computer experience, organizational support effects on computer anxiety, and self-efficacy. The model focuses on the people factors and organizational support and its effect on system factors and on system usage. In addition, the model do not identify the organizational factors clearly.

Personal computing acceptance model which was develop by Igbaria et al (1997). This model identifies two main variables for acceptance of the use of the system, and these variables are (intra-organizational, and extra-organizational support) and proposed that these factor will effect on perceived usefulness and ease of use. The model mainly focuses on the organizational side and its effect on the system factors then effect on the system usage. The model focused on organizational aspects, and part of system aspects and did not focus on other aspects that effect on end-user decision to use the system.

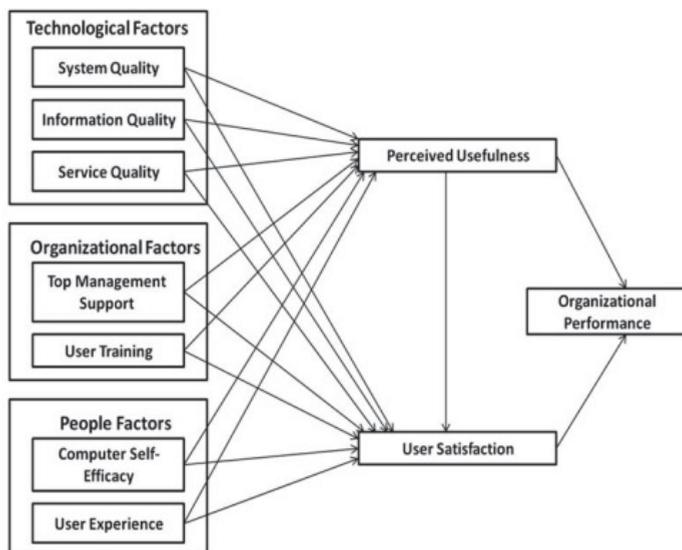
Based on the four models, the authors propose a model which integrates all the essential components. The proposed model consists of Technology Acceptance Model variables, information system success model variables, personal computing acceptance model variables, and computer usage model variables.

Table 1 shows the summary of the theories that used in this study. The summary of the four models are as indicated in Table 1.

**Table 1:** Summary of the Four Models of IS

Theory	Factors that adopted	Adopted	Key Elements
Technology Acceptance Model	Perceived usefulness	Davis (1989)	Most popular by the earlier researchers
IS Success Model	System Quality Information Quality Service Quality User Satisfaction Organizational Impact	DeLone & McLean (1992); Delone & Mclean (2003)	Most popular by the earlier researchers
Computer Usage Model	Self-Efficacy Experience	Igbaria & livari (1995)	Compatible with Yemeni problems.
Personal Computing Acceptance Model	Management Support Training	Igbaria et al. (1997)	Compatible with Yemeni problems.

### 3. Proposed Model



**Figure 1:** Proposed Model (TOP Model)

#### 4. Instrument Design

Based on the four models, questionnaire was developed. A questionnaire it is a set of standardized questions, often called items, which follow a fixed scheme in order to collect individual data about one or more specific topics (Lavrakas , 2008). The questionnaire was adopted because of the importance of the questionnaire in (1) saving time and effort on the researcher, and (2) the researcher need data from many people.

#### 5. Pilot Testing

An important component in the data collection process is that of the pilot study. Monette et al. (2013) defined pilot testing as small-scale trial run of all the procedures planned for use in the main study. A pilot study used to test the questionnaire, and ensure that respondents would be able to answer the questions without confusion. For this study, a pilot study conducted by administering the instrument to a small subset of the study's population and then by asking those participants to comment on those aspects of the instrument. To provide additional assurance of the reliability and validity of the measures, a pilot study conducted before the survey administer to the larger sample of end-user.

The original questionnaires were developed in English. Because Arabic is the official language in Yemen, some of the participants may not have had a comprehensive command of the English language. To avoid communication problems (back-translated problem) , the questionnaires were written on Arabic and English. The researcher reviewed each section of the questionnaires, including both wording and content. The responses to each question were evaluated. Overall, the pilot study participants indicated that the questionnaires were understandable. Table 2 shows the result of pilot testing.

**Table 2:** Pilot Testing Reliability Result

Construct	Cronbach's Alpha	N of Items
SyQ	0.852	7
IQ	0.846	7
SerQ	0.846	6
TMS	0.847	6
UT	0.861	6
CSE	0.862	6
UE	0.871	6
PU	0.855	6
US	0.842	6
OP	0.823	8

**Source:** Al-Mamary et al (2015a)

#### 6. Sampling and Profile

The purposive sample techniques used in this study. The questionnaire was distributed to selected respondents, and the researcher collected the questionnaires directly from the companies. A total of 114 questionnaires were returned out of 150 distributed. There were 10 incomplete questionnaires that were discarded. Therefore, only 104 questionnaires were used for data analysis, which represented a response rate of 69.33% of the original sample.

Part A of the questionnaire consist of the demographic information of the respondents. The respondents profile are as indicated in Table 3.

**Table 3:** Profile of respondents

		Frequency	Percent
Department	Information Systems/ IT	52	50
	Customers Service	52	50
Gender	Male	92	88.5
	Female	12	11.5
Age Group	Less than 30	54	51.9
	30 less than 40	48	46.2
	40 less than 50	2	1.9
Education	High School	2	1.9
	Diploma	7	6.7
	Bachelor	85	81.7
	Master	10	9.6
Designation	Administration Staff	25	24
	Technical Support Staff	43	41.3
	Head of Department	3	2.9
	Manager	3	2.9
	Others	30	28.8
Working Experience	Less than 2	18	17.3
	2 - less than 4	28	26.9
	4 - less than 6	25	24.0
	6 - less than 8	14	13.5
	Above 8	19	18.3

Source: Al-Mamary et al (2015a)

## 7. Summary of The Findings

Table 4 shows the findings based on the correlation analysis.

**Table 4:** Correlations

		Correlations									
		SyQ	IQ	SerQ	TMS	UT	CSE	UE	PU	US	OP
SyQ	Pearson Correlation	1	.670**	.453**	.509**	.421**	.319**	.375**	.354**	.471**	.261**
	Sig. (2-tailed)		.000	.000	.000	.000	.001	.000	.000	.000	.007
	N	104	104	104	104	104	104	104	104	104	104
IQ	Pearson Correlation	.670**	1	.583**	.604**	.485**	.377**	.302**	.437**	.581**	.302**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.002	.000	.000	.002
	N	104	104	104	104	104	104	104	104	104	104
SerQ	Pearson Correlation	.453**	.583**	1	.541**	.538**	.375**	.411**	.467**	.544**	.317**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.001
	N	104	104	104	104	104	104	104	104	104	104
TMS	Pearson Correlation	.509**	.604**	.541**	1	.522**	.296**	.223**	.496**	.557**	.429**
	Sig. (2-tailed)	.000	.000	.000		.000	.002	.023	.000	.000	.000
	N	104	104	104	104	104	104	104	104	104	104
UT	Pearson Correlation	.421**	.485**	.538**	.522**	1	.201	.233	.265**	.517**	.201**
	Sig. (2-tailed)	.000	.000	.000	.000		.041	.017	.007	.000	.041
	N	104	104	104	104	104	104	104	104	104	104
CSE	Pearson Correlation	.319**	.377**	.375**	.296**	.201	1	.404**	.495**	.368**	.298**
	Sig. (2-tailed)	.001	.000	.000	.002	.041		.000	.000	.000	.002
	N	104	104	104	104	104	104	104	104	104	104
UE	Pearson Correlation	.375**	.302**	.411**	.223**	.233**	.404**	1	.250**	.414**	.204**
	Sig. (2-tailed)	.000	.002	.000	.023	.017	.000		.009	.000	.038
	N	104	104	104	104	104	104	104	104	104	104
PU	Pearson Correlation	.354**	.437**	.467**	.496**	.265**	.495**	.250**	1	.558**	.557**
	Sig. (2-tailed)	.000	.000	.000	.000	.007	.000	.009	.000		.000
	N	104	104	104	104	104	104	104	104	104	104
US	Pearson Correlation	.471**	.581**	.544**	.557**	.517**	.368**	.414**	.558**	1	.427**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	104	104	104	104	104	104	104	104	104	104
OP	Pearson Correlation	.261**	.302**	.317**	.429**	.201**	.298**	.204**	.557**	.427**	1
	Sig. (2-tailed)	.007	.002	.001	.000	.041	.002	.038	.000	.000	.000
	N	104	104	104	104	104	104	104	104	104	104

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Based on Table 4, it can be deduced that there are a positive correlated relationship between technologica, organizational, and people factors with organizational performance. And Table 5 shows the results of the hypothesis in the findings.

**Table 5:** Summary of the Findings

No	The Research Hypothesis	The results
H1a	There is positive correlated relationship between system quality and perceived usefulness.	Supported
H1b	There is positive correlated relationship between system quality and user satisfaction.	Supported
H1c	There is positive correlated relationship between system quality and information quality.	Supported
H2a	There is positive correlated relationship between information quality and perceived usefulness.	Supported
H2b	There is positive correlated relationship between information quality and user satisfaction.	Supported
H3a	There is positive correlated relationship between service quality and perceived usefulness.	Supported
H3b	There is positive correlated relationship between service quality and user satisfaction.	Supported
H4a	There is positive correlated relationship between top management support and perceived usefulness.	Supported
H4b	There is positive correlated relationship between top management support and user satisfaction.	Supported
H5a	There is positive correlated relationship between user training and perceived usefulness.	Supported
H5b	There is positive correlated relationship between user training and user satisfaction.	Supported
H6a	There is positive correlated relationship between computer self-efficacy and perceived usefulness.	Supported
H6b	There is positive correlated relationship between computer self-efficacy and user satisfaction.	Supported
H7a	There is positive correlated relationship between user experience and perceived usefulness.	Supported
H7b	There is positive correlated relationship between user experience and user satisfaction.	Supported
H8a	There is positive correlated relationship between perceived usefulness and organizational performance.	Supported
H8b	There is positive correlated relationship between perceived usefulness and user satisfaction.	Supported
H9	There is positive correlated relationship between user satisfaction and organizational performance.	Supported

## 8. Conclusion

From the analysis and discussion it can be concluded that: 1) There are many theories that define the key factors for the successful adoption of the information systems and the acceptance of the use of technology in organizations. 2) This study combined the different theories in field of acceptance and use of the technology to develop integrated model. In addition, this study conducted a pilot testing for the integrated model, and evaluate the relationship between the variables in the model. 3) The study found that there are positive correlated relationship between the variables in the model. 4) The model can be implanted in context of Yemen.

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