Original Article: Evaluating the Relationship between Technology Management and Technology with Organizational Innovation

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ABSTRACT

The purpose of this paper was to investigate the relationship between technology management and technology with organizational innovation. This case study was conducted with Melli Bank branches in Behshahr. The research method was applied according to the purpose and according to the data collection is descriptive and survey type. The statistical population of the study included all official, contract, and contract employees of Melli Bank branches in Behshahr. A total of 134 people was reported, 98 of whom were randomly selected as a research sample according to Krejcie Morgan's table. The data collection instrument in this study was a researcher-made questionnaire. To analyze the data, the Pearson correlation coefficient test and structural equations have been used. The results showed that perceived usefulness is related to technology orientation. Perceived ease is related to technology orientation. Brand orientation is related to technology orientation. Tendency to technology is related to the use of technology and technology. And, the use of technology is related to innovation.

Introduction

Information and communication technology is a key factor in shaping the new global economy and bringing about rapid change in society [1-3]. Today, this technology has affected various aspects of the cultural, social, and economic life of individuals and communities. The importance of the role of communication and information technology in research and development and, consequently, proper culture building is so obvious that it does not leave any definition and description in its necessity and importance in today's world known as the age of communication. Because in the third millennium, any country that is equipped with advanced communication and information

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tools can obtain important and up-to-date information in the fastest possible time and analyze it for economic, industrial, social, cultural, and political purposes, as well as research, and achieving rapid growth and development [1-4]. One of the important factors in the use of information technology and new technologies is technology management and technology. Technology management is in fact the management of a system that enables the creation, acquisition, and application of technology and includes the responsibility that puts these activities in the service of human beings and meeting customer needs [5-7]. The level of innovation and creativity of human resources in the organization is one of the factors of progress and development of the organization. Innovation today is not a fad, but essential activity for the long-term survival of organizations. Technology and technology management will assist in activities that are underway to implement improvement ideas, and will assist in designing new products based on new needs or creating factors to carry out the required activities. In banks and financial institutions, most services are provided by human resources, and equipping resources to world-class standards requires skilled and trained staff. Ever since the importance of innovation and creativity became clear, creating the right IT infrastructure that can cover creativity and innovation has always been one of the challenges facing IT researchers. If an organization's IT infrastructure is inadequate and inflexible, it can be a barrier to managing creativity and innovation. The greatest application of IT is not just the solutions it offers but the questions it raises. These questions help the organization to identify its weaknesses and achieve sustainable competitive advantages and, consequently, its strategic goals and other goals and make significant improvements in productivity [8-12] As stated, creativity and innovation also have an impact on improving the status of the organization and its long-term survival and creating a competitive advantage for the organization. Accordingly, how to institutionalize creativity and innovation and align it with organizational goals to formulate and especially implement effective competitive strategies in the organization, will be an important issue. Given the issues raised, the present study seeks to answer these fundamental questions: Is there a relationship between technology management and technology with innovation in the organization? Is there a relationship between technology orientation and technology use?

In this study, data analysis was performed using descriptive and inferential statistics. Thus, first, descriptive statistics were used to describe the results obtained from the statistical population. In descriptive statistics, to organize, summarize, classify and describe the sample sizes, frequency distribution table, percentage, graph, and average were used. Hypotheses were analyzed and tested with the help of inferential statistics. To test the hypotheses, the structural equation test has been used to analyze the data and measure the correlation and using the statistics of t, F, and the probabilities related to the hypothesis test at a confidence level of ninety-five percent. In addition, all steps of description, composition, and testing of hypotheses have been performed using the software package, SPSS 18 and LISREL [12].

Research area

In this article, the spatial territory of the present study is the branches of Melli Bank in Behshahr. The scope of the research covers the year 2021, during which the research hypotheses are analyzed. The subject area of the research is the study of the relationship between technology management and technology and organizational innovation in the branches of Melli Bank in Behshahr. According to the model, the perceived usefulness is the mental probability formed in the users about the usefulness of an IT-dependent system, so that the more that system improves the work performance in the organizational context, the more useful it is and therefore the more it is used. This spectrum is a distance scale that consists of several expressions and answer options. Through this scale, the sensitivity, attitude,

belonging, and belief of responsive emotions can be determined.

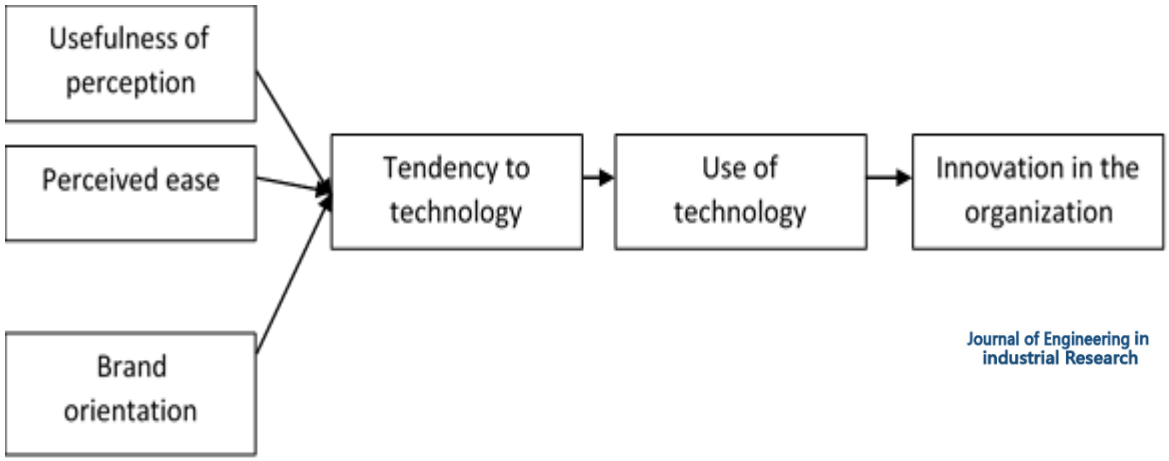

Figure 1. Conceptual model of research

Evaluating the normality of the data

Many statistical tests, including parametric tests, are based on the normal distribution of data and are used with the assumption that the distribution of data in a community or at the level of selected samples from the community follows the normal distribution. Therefore, the analyst must know the distribution of those variables before engaging in statistical analysis of the variables. This can be achieved with the Kolmogorov-Smirnov test. The null hypothesis in the Kolmogorov-Smirnov test is that the data follow the normal distribution and the opposite hypothesis is that the data does not follow the normal distribution. According to Tables (1), as seen in this test, the probability levels (P-value) in all research variables are greater than the line level 0.01. Given the value of P and not rejecting the null hypothesis, the data distribution is considered to be consistent with the normal distribution. As a result, parametric tests have been used to test the research hypotheses

Table 1. Test results for normality of research variables

H_0: (ρ=0)		The distribution of observations follows the normal distribution.		
H_1:($\rho \neq 0$)		The distribution of observations does not follow the normal distribution.		
Test result	Sig value	Test statistics	Number of samples	Variable
Normal distribution	0.71	0.69	98	Perceived usefulness
Normal distribution	0.051	1.35	98	Tendency to technology
Normal distribution	0.33	1.43	98	Perceived ease

Normal distribution	0.16	1.55	98	Brand orientation
Normal distribution	0.47	1.37	98	Use of technology and technology
Normal distribution	0.52	1.22	98	Organizational Innovation

Confirmatory factor analysis of perceived utility variables

However, exploratory factor analysis proposed a two-factor structure for the perceived usefulness variable; however, in order to ensure the fit of this structure with the collected data, it is necessary to perform confirmatory factor analysis using Lisrel software. Table 2 shows the model fit indices.

According to the obtained results and its comparison with the acceptable range, it can be acknowledged that all the fitness indicators of the above model are in the acceptable range and therefore the fit of the collected data with the model is desirable. Therefore, the suitability of the perceived utility model is confirmed. The figure shows the result of the fit of the measurement model in Lisrel software.

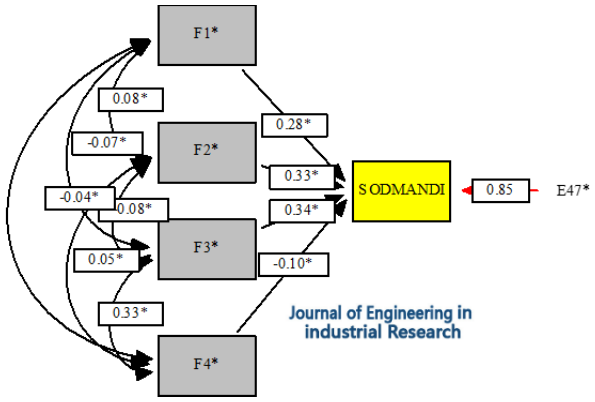

Figure 2. Model for measuring perceived utility variables in standard estimation mode

Table 2. Fits of the perceived utility variable measurement model

	Index title	Amount	Acceptable domain	Result
Squared	$\frac{x^2}{df}$	0	$\frac{x^2}{df}$	**Acceptable**
The root of the error of the mean squared approximation	RMSEA	0.000	RMSEA < 0.05	**Very well**
The root of the mean of the remaining squares	RMR	1	RMR ≥ 0	**Acceptable**

Goodness of fit	GFI	1	GFI > 0. 9	**Very well**
Modified fit goodness index	AGFI	1	AGFI > 0.85	**Very well**
Normalized fit index	NFI	1	NFI > 0.90	**Very well**
Adaptive Fit Index	CFI	1	CFI > 0. 90	**Very well**
Incremental fit index	IFI	1	IFI > 0. 90	**Very well**

Confirmatory factor analysis of technology orientation variable

However, exploratory factor analysis suggested a two-factor structure for the technology orientation variable; however, in order to ensure the fit of this structure with the collected data, it is necessary to perform confirmatory factor analysis using Lisrel software. Table 3 shows the model fit indicators. According to the obtained results and its comparison with the acceptable range, it can be acknowledged that all the fitness indicators of the above model are in the acceptable range and therefore the fit of the collected data with the model is desirable. Therefore, the suitability of the technology orientation model is approved.

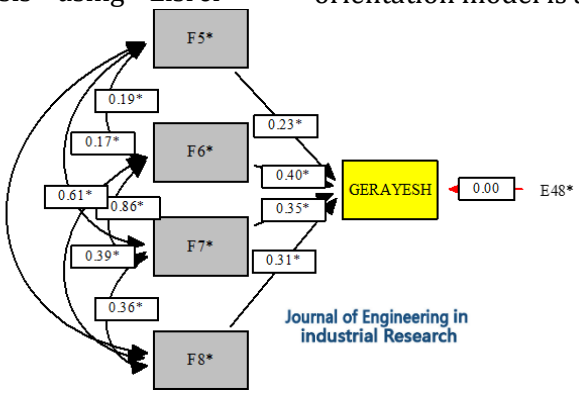

Figure 3. Model for measuring technology-oriented variables in standard estimation mode

Table 3. Fit indicators of the technology orientation variable measurement model

	Index title	Amount	Acceptable domain	Result
Squared	$\frac{x^2}{df}$	0	$\frac{x^2}{df}$	**Acceptable**
The root of the error of the mean squared approximation	RMSEA	0.000	RMSEA < 0.05	**Very well**
The root of the mean of the remaining squares	RMR	1	RMR ≥ 0	**Acceptable**
Goodness of fit	GFI	1	GFI > 0. 9	**Very well**
Modified fit goodness index	AGFI	1	AGFI > 0.85	**Very well**

Normalized fit index	NFI	1	NFI > 0.90	**Very well**
Adaptive Fit Index	CFI	1	CFI > 0. 90	**Very well**
Incremental fit index	IFI	1	IFI > 0. 90	**Very well**

Confirmatory factor analysis of perceived ease variable

However, exploratory factor analysis suggested a two-factor structure for the perceived ease variable; however, in order to ensure the suitability of this structure with the collected data, it is necessary to perform confirmatory factor analysis using Lisrel software. Table 4 shows the model fit indicators. According to the obtained results and its comparison with the acceptable range, it can be acknowledged that all the fitness indicators of the above model are in the acceptable range and therefore the fit of the collected data with the model is desirable. Therefore, the suitability of the perceived ease model is approved.

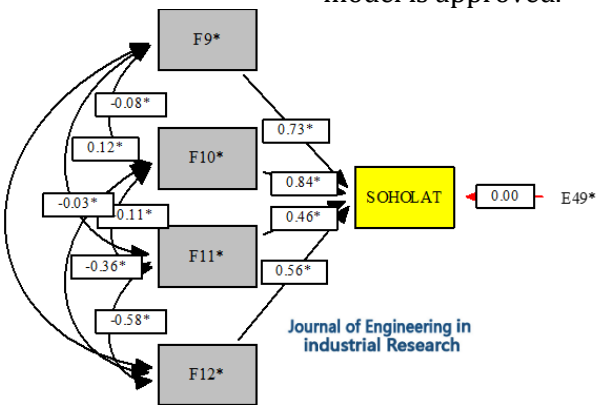

Figure 4. Model for measuring the perceived ease variable in standard estimation mode

Table 4. Fit indicators of the perceived ease variable measurement model

	Index title	Amount	Acceptable domain	Result
Squared	$\frac{x^2}{df}$	0	$\frac{x^2}{df}$	**Acceptable**
The root of the error of the mean squared approximation	RMSEA	0.000	RMSEA < 0.05	**Very well**
The root of the mean of the remaining squares	RMR	1	RMR ≥ 0	**Acceptable**
Goodness of fit	GFI	1	GFI > 0. 9	**Very well**
Modified fit goodness index	AGFI	1	AGFI > 0.85	**Very well**
Normalized fit index	NFI	1	NFI > 0.90	**Very well**
Adaptive Fit Index	CFI	1	CFI > 0. 90	**Very well**
Incremental fit index	IFI	1	IFI > 0. 90	**Very well**

Confirmatory factor analysis of brand orientation variable

However, exploratory factor analysis suggested a two-factor structure for the brand orientation variable; however, in order to ensure the suitability of this structure with the collected data, it is necessary to perform confirmatory factor analysis using Lisrel software. Table 5 shows the model fit indicators. According to the obtained results and its comparison with the acceptable range, it can be acknowledged that all the fitness indicators of the above model are in the acceptable range and therefore the fit of the collected data with the model is desirable. Therefore, the suitability of the brand orientation model is approved.

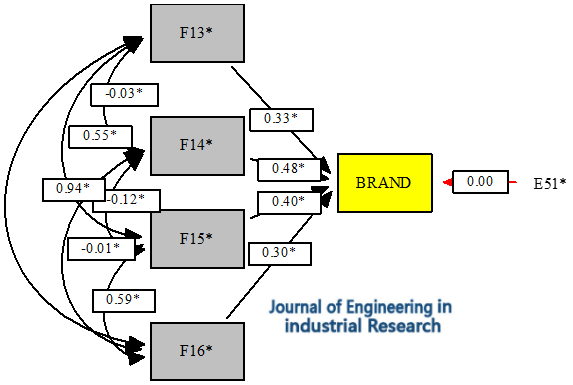

Figure 5. Model for measuring the brand orientation variable in standard estimation mode

Table 5. Fit indicators of the measurement model of the brand orientation variable

	Index title	Amount	Acceptable domain	Result
Squared	$\frac{x^2}{df}$	0	$\frac{x^2}{df}$	**Acceptable**
The root of the error of the mean squared approximation	RMSEA	0.000	RMSEA < 0.05	**Very well**
The root of the mean of the remaining squares	RMR	1	RMR ≥ 0	**Acceptable**
Goodness of fit	GFI	1	GFI > 0. 9	**Very well**
Modified fit goodness index	AGFI	1	AGFI > 0.85	**Very well**
Normalized fit index	NFI	1	NFI > 0.90	**Very well**
Adaptive Fit Index	CFI	1	CFI > 0. 90	**Very well**
Incremental fit index	IFI	1	IFI > 0. 90	**Very well**

Confirmatory factor analysis of technology use and technology variables

However, exploratory factor analysis proposed a two-factor structure for the variable of technology use and technology; however, in order to ensure the fit of this structure with the collected data, it is necessary to perform confirmatory factor analysis using Lisrel software. Table 6 shows the model fit indicators. According to the obtained results and its comparison with the

acceptable range, it can be acknowledged that all the fitness indicators of the above model are in the acceptable range and therefore the fit of the collected data with the model is desirable. Therefore, the suitability of the model of technology use and technology is approved.

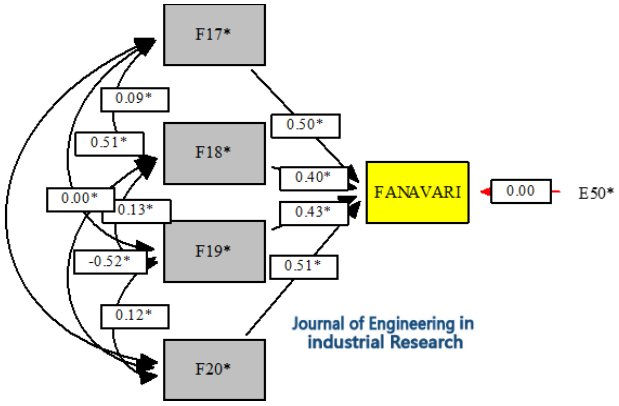

Figure 6. Phase A currents at any distance from the point of lightning when the lightning protection layer without corona breaks

Table 6. Fit indicators of the measurement model of variable use of technology and technology

	Index title	Amount	Acceptable domain	Result
Squared	$\frac{x^2}{df}$	0	$\frac{x^2}{df}$	**Acceptable**
The root of the error of the mean squared approximation	RMSEA	0.000	RMSEA < 0.05	**Very well**
The root of the mean of the remaining squares	RMR	1	RMR ≥ 0	**Acceptable**
Goodness of fit	GFI	1	GFI > 0. 9	**Very well**
Modified fit goodness index	AGFI	1	AGFI > 0.85	**Very well**
Normalized fit index	NFI	1	NFI > 0.90	**Very well**
Adaptive Fit Index	CFI	1	CFI > 0. 90	**Very well**
Incremental fit index	IFI	1	IFI > 0. 90	**Very well**

Final measurement model

Findings indicate that out of 98 studied samples, 9 (9.2%) have a master's degree, 20 (20.4%) have a bachelor's degree and 69 (70.4%) have a master's degree. Work experience of 8 people was (8.2%) under 5 years, 24 people (24.5%) 5 to 10 years, 49

people (50%) 10 to 15 years and 17 people (17.3%) over 15 years.

Hypothesis 1: There is a relationship between perceived usefulness and technology orientation.

The results in the first hypothesis indicate the relationship between perceived usefulness and technology orientation. To explain this finding, it can be stated that whenever the presence of technology in the organization improves the quality of work, ease of tasks, speed-up of work and increase in work productivity come around. Users are mentally challenged about the usefulness of an IT-dependent system in such a way that the more that system improves work performance in the organizational context, the more useful it is, resulting in a person's propensity and voluntary use of the technology.

Hypothesis 2: Perceived ease is related to technology orientation.

The results in the second hypothesis indicate the relationship between perceived ease and orientation towards technology. Whenever people in the organization realize that the use of information technology and technology is easy and flexible, they do not have any problems in learning it and easily acquire skills in it. The mental probability formed in users about the ease of use of an IT system increases and thus the less effort is required to learn and use the system, the more it is used and thus causes Individual orientation and voluntary use of this technology.

Hypothesis 3: Brand orientation is related to technology orientation.

The results in the third hypothesis indicate the relationship between brand orientation and technology orientation. Brand orientation refers to the attitude towards a brand as a positive or negative perception stored in a person's memory about a particular brand. This leads to a positive attitude towards technology and technology, and as a result, leads to a person's tendency and voluntary use of this technology.

Hypothesis 4: Technology orientation is related to the use of technology and technology.

The results in the fourth hypothesis indicate the relationship between the tendency to technology using technology and technology. Whenever there is a desire to use technology in the future, a desire to use technology continuously, a desire to use technology to perform tasks, and a desire to use technology when needed in employees, this leads to a tendency to use technology and technology

Hypothesis 5: The use of technology is related to innovation.

The results in the fifth hypothesis indicate the relationship between the use of technology and innovation. Explaining this finding, it can be stated that the usefulness of using technology and technology, and the ease of working with technology and the usefulness of its application, lead to the process of creating new ideas for effectiveness and usefulness through customer satisfaction. In fact, information technology is used to make active and correct decisions to improve business performance, which leads to organizational innovation.

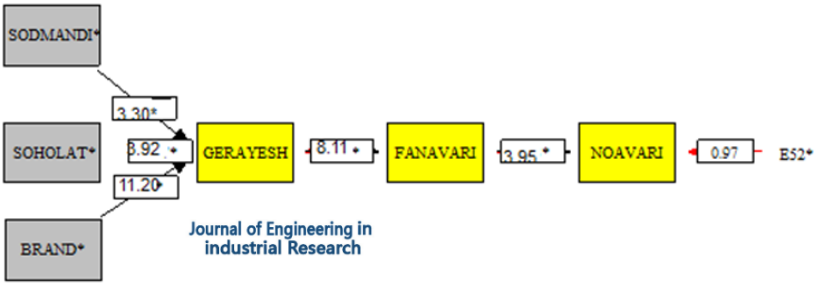

Figure 7. The final measurement model of the model with respect to T-Value values

Conclusion

Innovation is a non-linear process. In an organization, the processes, and activities that make them interact with each other. The element that plays a key role in these interactions, especially in administrative organizations, and is transferred between different activities, is information and data. Therefore, an appropriate technology structure and technology plays an important role in the success of the organization and leads to innovation in it. Technology can bring a lot of potential for innovation projects. The most important impact of technology is the analysis of performance and interactions between processes and their constituent activities, as well as the design of new information innovation processes to help employees have a process perspective. In fact, the real power of technology and technology is not in making old processes work better, but enabling organizations to break old rules and create new ways of working, that is engineering. The main advantage of technology in innovation depends on its disruptive power. Information technology has the power to break the rules and can make people think deductively and gain a competitive advantage for the organization. Technology is an essential element in the redesign and is of great importance as a key enabler in innovation.

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