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Examining the Role of Innovation in Enhancing Technological Capability in Organizational Performance Using Structural Equation Modeling (Case Study: Agricultural Bank of Tehran)

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A B S T R A C T

Objective: The aim of this research was to investigate the impact of innovation on enhancing technological capability in organizational performance.

Method: This study is practical in nature as its findings can be used by the Agricultural Bank of Tehran and is cross-sectional in terms of time. The research population consisted of headquarters managers and all senior branch managers of the Agricultural Bank of Tehran, totaling 32 headquarters managers and 460 deputy and senior branch managers, with a total of 115 branches. Therefore, the total number of senior managers is estimated to be 500. Accordingly, the sample size for this research is estimated to be about 217 individuals, based on Morgan's table. The sampling method used in this research was stratified random sampling. The data collection tool was a researcher-made questionnaire with 64 questions. The validity of the questionnaire was examined in terms of content validity and construct validity, and reliability was calculated using Cronbach's alpha. The conceptual model presented by the researcher was tested using structural equation modeling and the SMART-PLS software.

Results: Results showed that external stimuli have a significant positive impact on internal stimuli, open innovation, and closed innovation. Internal stimuli have a significant positive impact on closed innovation but no impact on open innovation. Also, open innovation does not affect technological capabilities. Closed innovation has a significant positive impact on technological capabilities, and technological capabilities significantly positively affect technology adoption. Ultimately, it was found that the impact of technology adoption on organizational performance is significant and positive.

Conclusion: The findings of this study provide valuable insights for managers and policymakers in the banking sector, particularly those looking to leverage innovation for technological advancement and superior organizational outcomes.

Keywords: *Innovation, Enhancement of Technological Capability, Performance, Organization, Agricultural Bank*

1 Introduction

Despite more than two decades since the emergence of the concept of innovation systems, there still exist conceptual ambiguities and a significant lack of analytical tools for this concept. The development of systems based on innovation in all fields has faced numerous challenges, and many scholars in this area believe that innovation should be viewed as a generative system in achieving specific goals in a coherent process. This concept indicates that innovation and, consequently, economic growth are born out of the systemic performance of institutions active in science and technology (Morawska-Jancelewicz, 2022). This system is part of a larger system that includes sectors such as universities, government, industry, and other environmental elements. The interaction of these elements can be the groundwork for the success of an innovative system. Indeed, in this chain, technology and the improvement of its capabilities are the products of innovation and its processes. In this regard, creating a systematic model and drawing an integrated framework between innovation and technology and the expected performance outcomes of this system is considered a necessity in innovation and technology studies (Ghanbarinejad Esfaghansary & Mohammadi Almani, 2012).

The advancement and development of technology in the last two decades of the last century became so widespread that it influenced all paradigms of human social life and introduced new designs, leading experts to believe that a new era in human civilization, named the era of communication and technology, has begun. A look at the rapid development of information technology on the one hand and the economic development of societies on the other, indicates a relationship between economic development and technological advancement in countries (Yin et al., 2022). It has now become clear that when a country's economy develops, its technology sector also grows at a faster pace. For example, in the 1990s, China's economy grew by 11 to 12 percent annually, but the growth of its technology sector was more than 25 percent. Consequently, in the past two decades, extensive efforts have been made in various countries to design, formulate, and implement technology development programs and their capabilities. In 2008, Iran ranked 78th among 154 countries studied in the field of information technology development, according to statistics provided by the International Telecommunication Union. This ranking was based on 11 different indicators over a five-year period. In this ranking, countries such as Qatar, Turkey, and the United Arab Emirates ranked higher than Iran. This means that Iran is actually in the lower half of this table. In terms of the digital access index, it is in the middle access category 5, ranking 88th, lower than countries such as China, Fiji, Jordan, and Turkey. These statistics have not changed significantly in recent years, indicating the country's need for the development of technological capabilities, especially in electronic technologies (Shojaan et al., 2019).

Certainly, the reasons for these deficiencies and weaknesses can be investigated in various dimensions. Geo-political conditions, cultural barriers, planning weaknesses, lack of investment and budget, intellectual property rights, and other political, social, cultural, and economic factors can be involved in the speed of technology growth and its capabilities, especially in the information technology sector in the country. In other words, weaknesses in the performance and interactions of a set of organizational actors, laws, regulations, and applied policies, along with environmental support factors, have been influential in slowing down the development of technology and its capabilities in the country. It seems that adopting the innovation system framework can create a suitable theoretical and analytical basis for analyzing the direct factors of the country's weakness in technology development and its capabilities. This is because many concepts of technology development and its capabilities are related to innovation concepts, and these two factors are intertwined (Mohajerani, Karimi, & Nadi, 2019).

Currently, rapid technological development, shrinking consumer and commercial markets, and highly unstable markets have imposed more requirements for corporate development. Although there is much research on companies' technological innovations, in many companies, technological innovation has only led to short-term performance growth. In such a dynamic environment, extensive management can no longer meet the growth needs of companies (Satalkina & Steiner, 2020). Therefore, organizational structure as the framework of an economic enterprise has attracted the attention of many experts and managers as the foundation of operations and management. From the first linear structure to the division system, and then the network structure, continuous changes in the external environment make structural innovation increasingly flat, decentralized, informal, and adaptable. Many companies have carried out organizational innovation activities and have adopted a flat, decentralized, and

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responsive organizational structure (Texeira-Quiros et al., 2022).

As experts acknowledge, one of the most important factors in the economic and social inefficiencies in developing countries, including our own, is institutional deficiencies, meaning the weakness of organizations, translations, laws, and regulations governing the development of technologies (Kurpayanidi, 2021). Therefore, some believe that for responding to development needs in the technology sector and its capabilities in the country, structural and institutional reforms must be carried out in this entire sector so that some experts in the field of information technology believe that the core of the innovation system approach is the institutional perspective on development and innovation. This means that having a systematic model with an appropriate structure in the field of innovation can direct the country and government and non-governmental organizations towards the development of technology and its capabilities and performance improvement (Ghanbarinejad Esfaghansary & Mohammadi Almani, 2012).

On the other hand, studies carried out by the Information Technology Committee for the development of COMSTEC indicate that the dynamic and creative combination of government and private sector actions within the framework of the national or sectoral innovation system of each country is formed and can provide opportunities for benefiting from technology and its capabilities in all less developed countries. Also, if there are no institutional changes, an appropriate and extensive model, technology, and its capabilities will be trapped in the mechanisms of traditional and inefficient institutions. In this case, it is unlikely that technology in developing countries can have a dynamic and proportionate trend. Institutional preparation and creating a systematic model for utilizing the potential capacities of innovation is one of the fundamental elements in the development of technological capabilities in a country (Mohajerani, Karimi, & Nadi, 2019).

Technological innovations and information technology are changing the way business is done and promising new processes and methods for companies. The deployment of information technology in business is evident in changing business activities towards using it to create new value for the company and customers. While recognizing the adoption of technological innovations and information technology in enhancing technological capabilities among companies is not an issue, fundamental questions are raised in creating the empirical commercial value of these technological innovations and the mechanisms through which they are realized in companies (Indrawati, Caska, & Suarman, 2020).

Therefore, attention to the issue of innovation in banking services and the development of technology and its capabilities in improving organizational performance in banks is also a topic that is felt to be urgently needed in the country. The lack of development of technological capabilities relying on innovation in the organization can pose serious problems for the country's banking industry (Kharidar & Pouya, 2016), and therefore the study of the role of innovation in enhancing technological capability in this area, especially in the country's state banks that provide the financial resources of the country in the field of production infrastructure and services, is of special importance. The aim of the current research in this regard is to study the role of innovation in enhancing technological capability in organizational performance. Therefore, based on the explanations provided in this research, we seek to answer the question of whether innovation plays a significant role in enhancing technological capability in organizational performance.

The research hypotheses presented in the structural model are as follows:

- External stimuli affect internal stimuli.
- External stimuli influence open innovation.
- External stimuli impact closed innovation.
- Internal stimuli affect open innovation.
- Internal stimuli influence closed innovation.
- Open innovation affects technological capabilities.
- Closed innovation impacts technological capabilities.
- Technological capabilities influence technology adoption.
- Technology adoption affects organizational performance.

2 Methods and Materials

2.1 Study design and Participant

This study is applied in nature because its findings can be utilized by the Agricultural Bank of Greater Tehran and is cross-sectional in terms of time. The study population includes the head office managers and all the senior branch managers of the Agricultural Bank of Greater Tehran, comprising 32 head office managers and 460 deputy and senior branch managers, making a total of 500 senior managers across 115 branches. Based on Morgan's table, the

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sample size for this research is estimated to be around 217 individuals. The sampling method used in this research is probabilistic stratified random sampling, meaning all individuals in the population have an equal chance of being included in the sample. Accordingly, 17 head office managers and 200 branch managers from the geographical regions of east, west, north, south, and north Tehran were selected.

2.2 Measures

2.2.1 Researcher-Made Questionnaire

The data collection tool was a 64-question researcher-made questionnaire.

2.3 Data Analysis

For analyzing the findings, Cronbach's alpha, CVR index, structural equation modeling, and SMART-PLS software were used.

3 Findings and Results

For testing content validity in this research, 30 experts were used. The minimum acceptable level for confirming each question with 30 experts is 0.33, calculated separately for each question. Since all questions have a CVR higher than 0.33, the questionnaire's content validity is confirmed (Table 1).

To confirm construct validity, Bartlett's test of sphericity should have a value of less than 5%, and for the Kaiser-Meyer-Olkin (KMO) sampling adequacy statistic, values above 50% are generally acceptable. These indices were measured for the variables of the study, and based on the obtained values, the construct validity of the variables was confirmed.

Table 1

The results of CVR values

Item	Frequency	CVR	Item	Frequency	CVR
1	21	0.400	33	22	0.467
2	21	0.400	34	23	0.533
3	23	0.533	35	21	0.400
4	20	0.333	36	21	0.400
5	23	0.533	37	24	0.600
6	25	0.667	38	25	0.667
7	22	0.467	39	24	0.600
8	21	0.400	40	23	0.533
9	20	0.333	41	26	0.733
10	20	0.333	42	24	0.600
11	24	0.600	43	23	0.533
12	22	0.467	44	22	0.467
13	23	0.533	45	26	0.733
14	21	0.400	46	21	0.400
15	25	0.667	47	21	0.400
16	21	0.400	48	23	0.533
17	20	0.333	49	22	0.467
18	22	0.467	50	27	0.800
19	23	0.533	51	24	0.600
20	24	0.600	52	21	0.400
21	25	0.667	53	20	0.333
22	21	0.400	54	20	0.333
23	26	0.733	55	21	0.400
24	23	0.533	56	20	0.333
25	27	0.800	57	23	0.533
26	21	0.400	58	20	0.333
27	20	0.333	59	23	0.533
28	24	0.600	60	22	0.467
29	21	0.400	61	21	0.400
30	23	0.533	62	25	0.667
٣١	25	0.667	63	23	0.533
٣٢	21	0.400	64	22	0.467

Table 2

The results Cronbach's Alpha for testing the reliability of the model

Dimension	Components	Number of Items	Alpha
Internal	Normative Stimuli	4	0.71
	Coercive Stimuli	4	0.76
	Mimetic Stimuli	4	0.79
External	Managerial Attitude	4	0.81
	Organizational Structure Compatible with Innovation	4	0.84
Open Innovation	Input	4	0.76
	Output	4	0.78
Closed Innovation		4	0.72
Technological Capabilities	Rapid Updating	4	0.82
	Alignment with Organizational Needs	4	0.79
Technology Adoption (Acceptance of Technology)	Trust	4	0.81
	Awareness	4	0.82
	Ease of Use	4	0.71
Organizational Performance	Economic Performance	4	0.74
	Market Performance	4	0.78
	Process Performance	4	0.71

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Cronbach's alpha method was used to measure the questionnaire's reliability. Table 2 shows the calculated Cronbach's alpha coefficient for the research variables. The reliability coefficient for the research variables is presented in Table 2, indicating satisfactory reliability.

Table 3

Second order confirmatory factor analysis

Dimension	Component	Factor Loading	Approx. Error	t-value
External Stimuli	Managerial Attitude	0.5666	0.0219	25.8257
	Organizational Structure Compatible with Innovation	0.5238	0.0171	30.5514
Open Innovation	Inputs	0.6843	0.0539	12.704
	Outputs	0.4549	0.0498	9.1348
Closed Innovation	IN1	0.315	0.0102	30.7589
	IN2	0.2801	0.0075	37.3402
	IN3	0.2679	0.0082	32.8402
	IN4	0.3637	0.013	27.9196
Technological Capabilities	Rapid Updating	0.5458	0.0083	65.9654
	Alignment with Organizational Needs	0.5149	0.0056	91.8301
Technology Adoption	Trust	0.1581	0.0263	6.0095
	Awareness	0.5097	0.0137	37.3068
	Ease of Use	0.4925	0.011	44.5843
Organizational Performance	Economic Performance	0.106	0.0365	2.9046
	Market Performance	0.543	0.0161	33.756
	Process Performance	0.506	0.0086	58.6036
Internal Stimuli	Normative Stimuli	0.4648	0.0185	25.0877
	Coercive Stimuli	0.3681	0.0106	34.8598
	Mimetic Stimuli	0.3786	0.0108	34.9752

According to structural model analysis, the results of the second-order factor analysis of the research variables are shown in the Table 3. This table shows the extent to which each variable contributing to the conceptual constructs has played a role in forming the measurement model and also the significance of these variables is shown in the table. As seen in the table, the significance level of all of them is above 1.96, therefore the structural model's constructs are significant.

After examining the factors constituting the research construct in this section, we test the research hypotheses using path analysis, as shown in the figure below. Each arrow represents a pathway and a hypothesis. Additionally, the analysis of the

Figure 1 results is detailed in Table 4.

Table 4

The results of path analysis

Path	Factor Load	Approx. Error	t-value	Result
EXD->IND	0.71	0.0384	18.4945	Approved
EXD->OPI	0.351	0.0748	4.6932	Approved
EXD->CIN	0.721	0.0159	45.2719	Approved
IND->CIN	0.347	0.0296	11.7209	Approved
IND->OPI	0.022	0.0496	0.4436	Rejected
OPI->ATE	0.016	0.0234	0.6842	Rejected
CIN->ATE	0.86	0.0184	46.6846	Approved
ATE->ACE	0.973	0.0076	127.72	Approved
ACE->PER	0.951	0.0206	46.0903	Approved

EXD: External Stimuli; IND: Internal Stimuli; OPI: Open Innovation; CIN: Closed Innovation; ATE: Technology Capabilities; ACE: Technology Acceptance; PER: Organizational Performance

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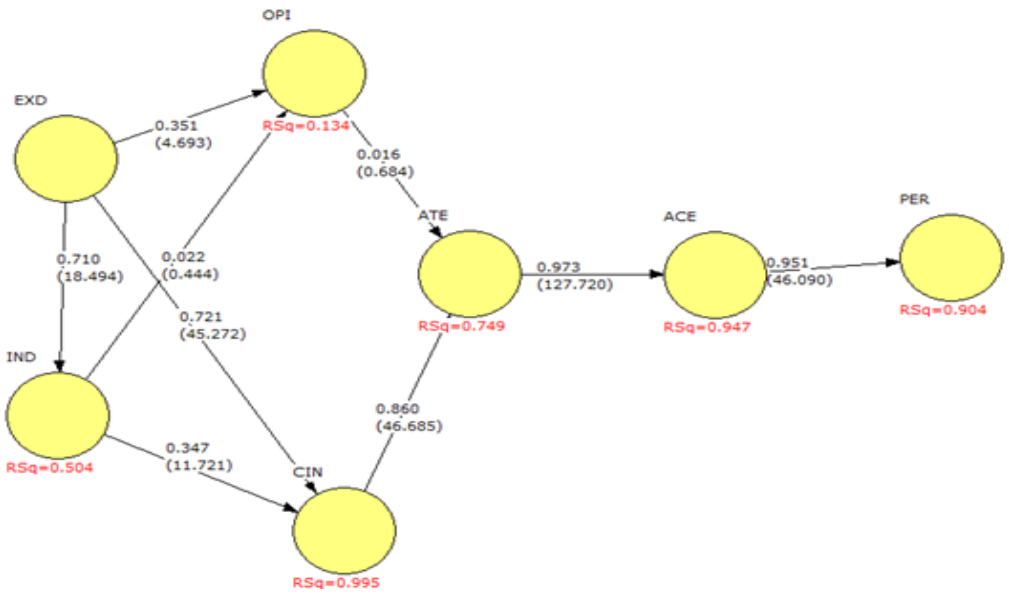
Figure 1

The structural model with path coefficients and t-values



4 Discussion and Conclusion

The purpose of this study is to investigate the role of innovation in enhancing technological capability in the performance of the Agricultural Bank. The results showed that external drivers have an impact on internal drivers. In this section, we examine the first hypothesis of the study using path analysis. Since the standard coefficient in the path from external drivers (EXD) to internal drivers (IND) is 0.71, and the significance level in this path is estimated at 18.4945, the hypothesis is confirmed, as the significance level is higher than 1.96. Internal drivers include factors that are within the organization and can be controlled or managed. Internal drivers significantly affect the performance and progress of organizations. The internal drivers confirmed in this study are the attitude of managers and an organizational structure compatible with innovation. When the attitude of managers and organizational structure are appropriate, performance will be enhanced. External drivers, which are not under the control and management of the organization, can still impact organizational performance. External drivers, such as social laws and norms, will force organizations to change behavior, as organizations must adapt to their operating environment. Failure to adapt will lead to failure. This study also showed that internal drivers are influenced by external drivers. External drivers affect open innovation. In this section, we examine the second research hypothesis using path analysis. Since the standard coefficient in the path from external drivers (EXD) to open innovation (OPI) is 0.351, and the significance level in this path is estimated at 4.6932, the hypothesis is confirmed, as the significance level is higher than 1.96. Today, organizations face numerous changes in their environment, so they need to use both external and internal ideas and paths to the market, as they seek to advance their technology. One factor that will lead to organizational advancement is open innovation. Open innovation is a term used to promote the information age mindset towards innovation, opposing the secrecy and silo mentality of traditional corporate research laboratories. Attention to open innovation with increasing collaboration in a complex world is necessary. Open innovation examines a wide range of internal and external sources and can be analyzed at the company level as well as inter-organizational, intra-organizational, extra-organizational, and analytical levels. Therefore, external drivers can influence open innovation. External drivers, such as environmental changes, changes in laws, societal changes, and changes in business technology, will change the business environment. Organizations that want to continue their activities must respond and adapt to these external drivers. The results of this hypothesis also showed that external drivers have a positive and increasing impact on open innovation. External drivers affect closed innovation. In this section, we examine the third research hypothesis using path analysis. Since the standard coefficient in the path from external drivers (EXD) to closed innovation (CIN) is 0.721, and the significance level in this path is estimated at

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45.2719, the hypothesis is confirmed, as the significance level is higher than 1.96. Closed innovation is created by an internal team of a company. Closed innovation remains under the control of the company without any external source, intrusion, technology, or intellectual property. Closed innovation is valuable, with benefits such as complete control over the innovation process, significant reduction in failure for tasks performed, independence from external knowledge that can be a limiting factor during innovation, the possibility of a monopoly in the innovation process, where products/services can provide a tremendous competitive advantage. External drivers are factors that influence organizations and cause changes in employee attitudes, leading to new ideas. External drivers, such as changes in competitors' activities, changes in electronic and remote service delivery, and activities of major banks domestically and abroad, can influence bank innovation. The results of this hypothesis showed that external drivers have a positive and increasing impact on closed innovation. Internal drivers affect open innovation. In this section, we examine the fourth research hypothesis using path analysis. Since the standard coefficient in the path from internal drivers (IND) to open innovation (OPI) is 0.022, and the significance level in this path is estimated at 0.4436, the hypothesis is rejected, as the significance level is less than 1.96. Today, organizations that can adapt to environmental changes can continue their activities. The open innovation paradigm can be interpreted beyond using external innovation sources, such as customers, competitor companies, and academic institutions, and can change in use, management, and use of intellectual property. Open innovation encourages businesses to motivate employees to present ideas. When this collaboration and participation decrease, it will prevent the presentation of new thinking or ideas, and therefore no innovation will occur. The results of this hypothesis showed that internal drivers do not affect open innovation, and this hypothesis was rejected. The results of this hypothesis can be explained by the fact that banks in Iran have a formal environment with many laws, preventing employee cooperation and participation. Employees in banks only perform their specific duties and refrain from presenting their ideas.

Internal drivers impact closed innovation. In this section, we examine the fifth hypothesis of the research using path analysis. Since the standard coefficient in the path from internal drivers (IND) to closed innovation (CLN) is 0.347, and the significance level in this path is estimated at 11.7209, the hypothesis is confirmed as the significance level is higher than 1.96. Managing changes is a key element for the success and survival of any organization, and acquiring this ability requires the organization's focus on innovation. Successful organizations are those that consider innovation a fundamental principle. Closed innovation, one of the types of innovation under focus, is often performed by employees and is essential for gaining benefits and enhancing performance. In closed innovation, managers and their employees are innovative, enabling the organization to align with transformations and respond to customer needs and the environment. Organizations must strengthen their ability in closed innovation. Internal drivers such as managerial attitudes and organizational structures conducive to innovation are influential factors. Employees become innovative when the organizational attitude and environment create a motivational and encouraging space. When managerial attitudes are innovation-oriented and see change as the organization's salvation, it encourages innovation in the organization. Open innovation impacts technological capabilities. In this section, we examine the sixth hypothesis of the research using path analysis. Since the standard coefficient in the path from open innovation (OPI) to technological capabilities (ATE) is 0.016, and the significance level in this path is estimated at 0.6842, the hypothesis is rejected as the significance level is less than 1.96. Technological capability is described as a company's ability to design and develop new processes, products, enhance knowledge and skills about the physical environment in a unique way, and convert knowledge into instructions and plans for efficient performance. Technological capability not only requires technical mastery but also the capacity to expand and utilize the company's core capabilities, effectively combine different technology streams, and mobilize technology resources across companies. Additionally, it includes practical and theoretical knowledge, procedures, experiences, methods, equipment, and physical devices. In today's global and competitive economy, rapidly transforming through technology and innovation, technological development is crucial for advanced technology companies. Open innovation is among the effective factors on technological capabilities. Open innovation encourages organizations to collaborate with others and benefit from their experiences. Therefore, for organizations to have better technological capabilities than their competitors, they must welcome changes in the environment and competitors. The results of this hypothesis showed that open innovation does not impact technological capabilities, which can be explained by the fact that banks in

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Iran are bound by laws and bureaucracy, inhibiting innovation and significant changes in service types. Hence, this hypothesis is rejected. Closed innovation impacts technological capabilities. In this section, we examine the seventh hypothesis of the research using path analysis. Since the standard coefficient in the path from closed innovation (CIN) to technological capabilities (ATE) is 0.86, and the significance level in this path is estimated at 46.6846, the hypothesis is confirmed as the significance level is higher than 1.96. Technological capabilities allow productive organizations to use equipment and technology efficiently. They are considered a crucial element in the economic growth of a nation, as the development of a business depends on its ability to introduce new products over time. Technological capability aids in achieving higher levels of economic performance for companies, as it enables incremental advancements using new technologies. To enhance technological capabilities, organizations must be innovative. Closed innovation is a type of innovation that can influence technology. In this method, employees are encouraged to perform activities in new ways, and work methods are regularly updated. The results of this hypothesis also showed that closed innovation impacts technological capabilities, which can be explained by the fact that organizations with closed innovation characteristics welcome new technology and invest in this area.

Technological capabilities influence the adoption of technology. In this section, we examine the eighth hypothesis of the research using path analysis. Since the standard coefficient in the path from technological capabilities (ATE) to technology acceptance (ACE) is 0.973, and the significance level in this path is estimated at 127.72, the hypothesis is confirmed as the significance level is greater than 1.96. The use of information and communication technology in service-providing organizations has become a critical strategy for achieving a competitive advantage. Technology acceptance is expected to provide opportunities for human resource performance to find new ways to aid organizational effectiveness. Determinants of technology use have been examined to predict and explain the acceptance and end-user adoption of information technology and systems. One of these determinants is technological capabilities, which include technical, managerial, and institutional knowledge and skills. These allow productive companies to use equipment and technology efficiently. Technological capabilities enable organizations to strive for the acquisition and creation of knowledge that must be used in production. They can be evaluated based on a company's ability to identify its technological needs and select technology to meet those needs. Technological capabilities allow organizations to update themselves quickly and adapt to new systems. The results of this hypothesis also showed that technological capabilities influence technology acceptance, explained by organizations with high technological capabilities striving to acquire and implement new technology for better customer service. Thus, these organizations, by increasing electronic services, can attract customer trust and enhance technology acceptance among domestic and international customers. Technology acceptance affects organizational performance. In this section, we examine the ninth hypothesis of the research using path analysis. Since the standard coefficient in the path from technology acceptance (ACE) to organizational performance (PER) is 0.951, and the significance level in this path is estimated at 46.0903, the hypothesis is confirmed as the significance level is greater than 1.96. The primary goal of any organization is to enhance and develop performance, as a company's performance equates to organizational efficiency, indicating the degree to which an organization, as a social system with limited resources and tools, achieves its goals without overburdening its members. Continuous performance is the focus of every organization, as only through improved performance can organizations grow and progress. Therefore, organizational performance is one of the most critical research variables in management and certainly the most important indicator of organizational performance. Most companies seek to improve their performance through various methods. Organizational performance is subject to many variables, some internal and some external. Studies have shown that company performance is effectively influenced by technology acceptance. Technology acceptance, by creating and focusing on the three configurations of flexibility, efficiency, and comprehensiveness, will enhance performance. In recent decades, technology has proliferated everywhere. Technology acceptance is essential for an organization's survival, as it leads to new ideas, technology, innovation, and improvement (Barzegar Abbaspour, Eslami Mofid Abadi, & Ebrahimi Shaghaghi, 2023). Technology will compel organizations and individuals to abandon old habits and develop new behaviors and processes that make them more effective and efficient. Regarding the alignment of the findings of this research, reference can be made to the research of Shojaan et al. (2020) who showed that the functions of the technological innovation system in Iran

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include knowledge creation, knowledge dissemination, entrepreneurial activities, legitimization, resource mobilization, and market shaping (Shojaan et al., 2019). In this case, the technological innovation system in Iran involves drivers and strategies based on open innovation. The results of Ghanbarinejad and Mohammadi (2019) showed that the use of technology management and research and development leads to the enhancement of quality performances and, more importantly, strengthens innovation performances in organizations (Ghanbarinejad Esfaghansary & Mohammadi Almani, 2012). Mohajerani et al. (2019) categorized the influential components of implementing open innovation in the university into three groups: factors related to the organization and its structure, factors related to the university's customers, and factors related to internal and external communications (Mohajerani, Karimi, & Nadi, 2019). Also, the results of Zeb et al. (2020) demonstrated that the type of culture in an organization, drivers such as organizational communications, flexibility, inter-functional relations, and employee skills are effective in improving the innovation process in the organization, which in turn improves organizational performance (Zeb et al., 2021). Finally, some considered factors related to innovation, technology acceptance, organizational support, and coordination-related factors as influential in the success of innovative technology adoption (Giesen et al., 2007; Indrawati, Caska, & Suarman, 2020; Kamal, 2006; Kurpayanidi, 2021; Satalkina & Steiner, 2020; Texeira-Quiros et al., 2022).

5 Limitations and Suggestions

The study encountered several limitations. Firstly, the research was conducted specifically within the context of the Agricultural Bank of Tehran, which may limit the generalizability of its findings to other organizations or industries. This specificity raises concerns about the applicability of the results in different organizational environments or cultural contexts. Secondly, the study relied solely on qualitative methods, which, while providing in-depth insights, may lack the statistical robustness and broader representativeness of quantitative approaches. The absence of quantitative data may limit the ability to generalize findings or establish more definitive cause-and-effect relationships. Additionally, the research might be subject to the biases and subjective interpretations of the respondents, especially since the data collection was based primarily on questionnaires and interviews. Finally, the rapidly evolving nature of technology and innovation means that the findings may have a limited shelf life, requiring continuous updates to remain relevant in the ever-changing landscape of organizational performance and technology adoption.

Based on the results obtained and the importance thereof, the following recommendations are suggested in order of the hypotheses:

- Banks should pay attention to environmental changes and learn from the experiences of successful banks. It is also recommended to provide useful and effective training courses to change managers' attitudes towards environmental changes.
- It is suggested that banks respond to environmental changes, follow the policies of major banks in the world in terms of innovation, and create an appropriate space for developing innovation.
- It is advised that banks encourage their employees and managers to perform their daily activities in new ways, express their ideas and opinions, and supervisors should provide constructive feedback to employees according to the situation.
- It is recommended that managers have a positive attitude towards innovation, understanding that innovation is the key to survival in the current competitive environment. Managers should abandon traditional thinking and encourage employees to be sensitive to environmental changes and strive to act in accordance with the advancements and changes of competitors.
- It is suggested that in banks, the organizational structure should move towards decentralized structures, flexibility and teamwork should be encouraged, and groups supporting innovation and idea creation should be established in the organization.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics principles

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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