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Original Research

Impact of Organizational Maturity on Acceptance and Use of Technology Among Library and Information Science Experts in the Public Libraries of Mashhad

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Abstract

The present research was conducted to measure the impact of organizational maturity on the main variables of the unified theory of acceptance and use of technology among library and information science experts in the public libraries in Mashhad. It is applied research in terms of purpose and correlation-descriptive research in terms of the data collection method. The research statistical population included all library and information science experts in Mashhad city, which were selected as research samples using random sampling. The questionnaire was used as a data collection tool. The average variance extracted (AVE) was used to assess the validity of the questionnaire, and the composite reliability (CR) coefficient and Cronbach's alpha coefficient were used to assess the reliability of the questionnaire. The structural equation modeling method (partial least squares method) was used with Smart PLS software to test the research hypotheses and the research conceptual model. According to the results, it can be stated that the variable of organizational maturity has a significant and positive effect on the components of the unified theory of acceptance and use of technology, including performance expectancy, facilitating conditions, social influence, purposeful behavior, but this variable does not have a significant and positive effect on the effort expectancy. Organizational maturity affects the acceptance and use of technology by public library librarians.

Keywords: Organizational Maturity, Technology Acceptance, Technology Use, Public Libraries, Library and Information Science, Mashhad, Iran.

Introduction

Since the individual use and utilization of technology by users is one of the most important factors in the success of that technology (Selder, 2005), attention to users, their attitudes, and

desires has long been one of the main concerns of designers and manufacturers of information systems. Increasing material and spiritual investments in designing and implementing these technologies have accelerated and intensified these studies (Rezaei, 2009). To this end, researchers have tried to identify the factors that can affect users' acceptance and use of information technology, considering the users' attitudes and desires as influential factors in the acceptance and use of technology by developing different models. These models, most of which originate from psychological, sociological, and information system concepts (ibid), help identify the factors affecting users' acceptance of technologies and the relationships between these factors (Sun & Zhang, 2006). On the other hand, using models easily helps organize the data, determine the relationship between them, and draw complex social issues (Kafashan, 2010). It seems that the issues related to the adoption of technology in a triple division (before the change, during the change, and after the change) are the same in all organizations; what differentiates the technology adoption process of one organization from another organization is the way of managing and implementing that technology (Saghafian, Laumann & Skogstad, 2021).

One of these models is the " Unified Theory of Acceptance and Use of Technology= UTAUT". This model's components affecting people's behavioral tendencies include performance expectancy, effort expectancy, social influence, facilitating conditions, and purposeful behavior (Figure 1). Also, in this model, four variables of gender, experience, age, and the optionality of using technology as moderating variables affect the main components of the model (Venkatesh, Morris, Davis & Davis, 2003).

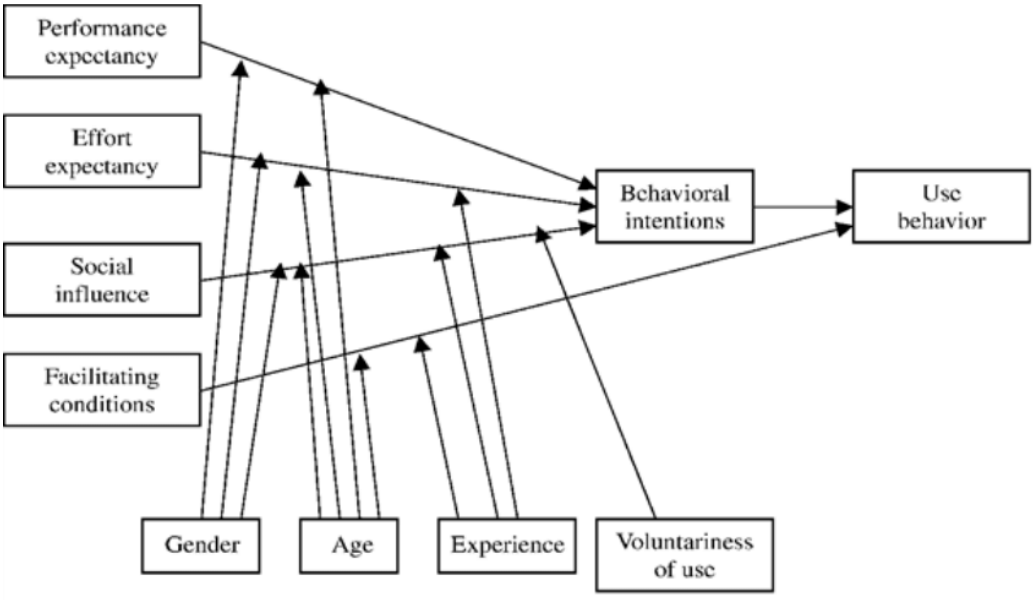

Figure 1: Unified theory of acceptance and use of technology (Venkatesh et al., 2003)

This model aims to find a unified view of the users' acceptance of technology. Since this model contains all the determinants of previous models, it can provide acceptable results in real samples and systems (Venkatesh et al., 2003; Kijsanayotin, Pannarunothai & Speedie, 2009).

Research hypotheses

In the present study, which aims to measure the impact of organizational maturity on the

Unified Theory of Acceptance and Use of Technology (Figure 2), we seek to test the following hypotheses:

The organizational maturity of public libraries affects the components of the :"performance expectancy," "effort expectancy, "social influence," "facilitating conditions," and "purposeful behavior" of library and information science experts working in these libraries to accept and use existing technologies

Research background

Although the "Unified Theory of Acceptance and Use of Technology" is a robust model that is widely recognized in the field of "information science" to predict the acceptance and behavior of information use, it also has some limitations (Moghavvemi, Salleh & Abessi, 2013).

One of these limitations is that the role of external variables that potentially facilitate or inhibit a person's behavioral performance is not considered. This has led to numerous studies at home and abroad for measurement of the impact of these external variables on the purposeful behavior of users in the acceptance and use of technology (Bhatiasevi, 2015; Hsu et al., 2014; Alharbi, 2014; Venkatesh & Zhang, 2010; Venkatesh, Thong & Xu, 2012; Hamidfar, Limayem & Zegordi, 2008; Jahangir, Kiani & Talebzadeh, 2020; Jalali, Ashrafirizi, Soleimani & Afshar, 2017; Khadivar & Ebrahimpoor Arangi, 2016; Ghanei, 2014; Atafar, Khazai pul & Pur mostafa Khoshrudi, 2012; Najafi, Jafarpour & Hobbi, 2011).

On the other hand, the research findings demonstrate that the quality and quantity of acceptance and use of a technology justify the mere material and spiritual resources for its design and operation (Makkizadeh, Farajpahlou, Osareh, Sheniyailagh, 2012; Nazari, Khosravi & Nooshinfard, 2012; Koufaris, 2002). For this purpose, paying attention to an organization's long-term goals and plans and moving continuously toward a specific organizational vision is necessary. Organizational maturity is one of the factors affecting this movement. It is a component that enables organizations to achieve stability and success and outperform competitors through standardization in applying knowledge, skills, and proper management practices (Benbasat, Dexter & Mantha, 1991). A maturity model represents a pre-planned evolution path for a class of objects composed as a discrete stage or level. There for, the maturity model is an effective tool to assess the current capabilities and the future needs of an organization, process, or group (Tiwari & Madalli, 2021). This factor is significant in the organizational growth process and requires various infrastructures. Organizational maturity requires individual maturity. Individual maturity begins with employees' mental assumptions and is completed by changing their beliefs and attitudes. Ultimately, the maturity of an organization's employees results in organizational maturity. In this case, the structures, methods, and processes become agile, up-to-date, and simple, and the organization's adaptability to environmental and technological changes increases. After the maturation process in an organization has been completed, it is time to determine the level of organizational maturity. At this stage, the organization identifies its strengths and weaknesses and accordingly develops approaches appropriate to the level of maturity. Finally, it can be said that organizational maturity, as a reference point, helps the organization to be evaluated through self-evaluation and even through extra-organizational evaluation against the superior solutions of one or more special instructions (Soltani & Bahrami Nejad Joneghani, 2010).

Furthermore, electronic documents and document management systems (DMS) indicate an organization's maturity. The results showed that the maturity of an organization affects the

document management system cycle. Organizations that manage the DMS life cycle efficiently due to organizational maturity; cope more easily with digital transformation and issues related to e-commerce (Zabukovšek, Jordan & Bobek, 2023).

Public libraries are called the public university. Based on the guidelines of the *International Federation of Library Associations* and Institutions (*IFLA*), the role of public libraries is focused on the cultural and artistic growth of the community. The UNESCO Declaration also mentions public libraries as a highway for the cultural development of individuals and social groups. It introduces raising the awareness of individuals about cultural heritage and supporting cultural dialogue and cultural diversity as essential missions of these libraries (Biranvand & Nikkar, 2012). These definitions show the undeniable role of public libraries in creating culture, spreading ideas, attitudes, tools, and, most importantly, innovation in society. Suppose the development of technological tools is considered an innovative phenomenon of the present century, thus developing and expanding the correct and rational use of these innovations. In that case, we must start with public libraries and their specialized human resources, i.e., library and information science experts. On the other hand, as previously mentioned, growth and development in any organization are not achieved overnight and require passing the stages of organizational maturity. Public libraries are no exception. Research results by Tiwari & Madalli (2021) show that several domain-specific free and commercial maturity models can improve the library and information services. Library and information professionals should utilize the opportunity available in user training and community support for maturity models to foster information services. The literature review indicated that no research has specifically addressed the impact of organizational maturity on the acceptance and use of technologies available in libraries, and most of these studies have only re-tested this model in different settings and only presented the pattern of information technology maturity.

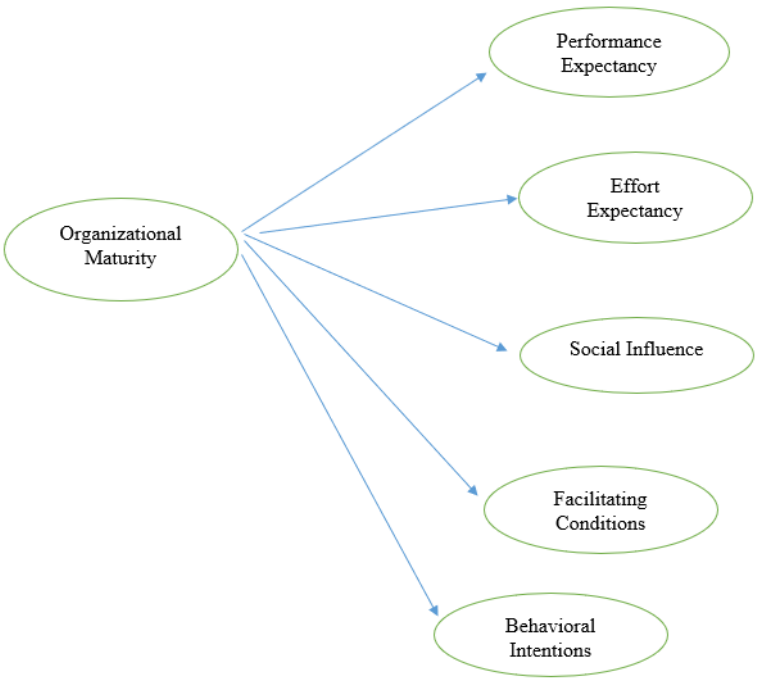

Figure 2: The effect of organizational maturity on performance expectancy, effort expectancy, social influence, facilitating conditions, and purposeful behavior

Materials and Methods

Since the current study investigates the impact of organizational maturity on performance expectancy, effort expectancy, social influence, facilitating conditions, and purposeful behavior, the research method used is applied in terms of purpose and descriptive-correlational research regarding the data collection method. The research statistical population included all library and information science experts in Mashhad (n = 86) who were selected as a research sample using random sampling. The questionnaire was used as the data collection tool (appendix). The research questionnaire consists of three parts, including the introduction, the demographic items, and the items for measuring the main variables of the research. 32 items were designed by combining questionnaires from other studies related to the research topic to measure the main research variables. The scale for measuring the variables in this research is the five-point Likert scale (from strongly agree to disagree strongly). Table1 provides the necessary information on how to design the questionnaire items.

Considering that this research questionnaire was developed based on the questionnaires and research of other researchers and its validity has already been measured, it can be said that the research questionnaire has the necessary validity. However, face content validity was used to determine the validity of the research questionnaire. To this end, the designed questionnaire was provided to several university professors and experts in the field of information science, and they were asked to comment on the validity of the questionnaire. After collecting comments, the final questionnaire was designed. Cronbach's alpha coefficient was used as the most common method of assessing the questionnaire's reliability to measure the reliability of the research questionnaire. If Cronbach's alpha coefficient for all variables is higher than 0.7, it implies an appropriate coefficient, suggesting that the reliability of the research tool is at an appropriate level. The average variance extracted (AVE) index was used to assess the validity of the questionnaire items, and the composite reliability (CR) coefficient was used to assess the questionnaire's reliability. Table 1 shows the results of the validity and reliability indexes of the questionnaire.

Table 1

Research variables and sources for extraction of items and results of reliability of data collection tool (questionnaire)

Variable	Number of items	Source	AVE	CR	Cronbach's alpha
Organizational maturity	13	Soltani & Bahrami Nejad Joneghani, (2010)	0.589	0.949	0.942
Performance expectancy	4	Venkatesh et al. (2003)	0.692	0.900	0.857
Effort expectancy	3	Venkatesh et al. (2003)	0.678	0.863	0.784
Social influence	5	Venkatesh et al. (2003)	0.774	0.911	0.854
Facilitating conditions	3	Venkatesh et al. (2003)	0.662	0.907	0.871
Purposeful behavior	4	Venkatesh et al. (2003)	0.579	0.845	0.764

Fornell and Larker (1981) proposed using the AVE criterion to calculate convergent

validity. If AVE is at least 0.5, it indicates the good convergent validity of variables. This means that a latent variable can explain more than half of the variance of the indices of its observed variables on average. Given that the AVE index in the present study for all research variables is above 0.5, then the convergent validity of the model variables is confirmed. The composite reliability coefficient (CR) and Cronbach's alpha coefficient measure the reliability of the measurement tool as shown in Table (1). Considering that the value of the composite reliability coefficient (CR) and Cronbach's alpha coefficient for all research variables are greater than 0.7, the reliability of the items of the questionnaire is appropriate and acceptable.

The structural equation modeling method (partial least squares method) was used with Smart PLS software to test the hypotheses and the conceptual model of the research. The reason for using Smart PLS software is that the present study has a low number of samples, and the conceptual research model cannot be tested with LISREL and AMOS software that is sensitive to the number of statistical samples.

Results

Descriptive statistics were used to analyze the research data and the demographic variables. The highest gender of respondents was females (87.4%), the highest age of respondents was 30 to 40 years (90.8%), the highest working experience of respondents was 10 to 15 years (39.1%), and the highest education level of respondents was BA (79.3%).

Testing the research conceptual model

Structural equation modeling using Smart PLS software measured the conceptual model and research hypotheses. Figure 3 shows the research model for estimating standard path coefficients. All research variables are divided into two categories: latent and observed variables. Observed (rectangular) variables are measured directly by the researcher, while latent (elliptical) or unobserved variables are not measured directly, rather, they are inferred based on relationships or correlations between the measured variables. Latent variables represent a set of theoretical constructs that are not directly visible and are constructed and observed with other observed variables.

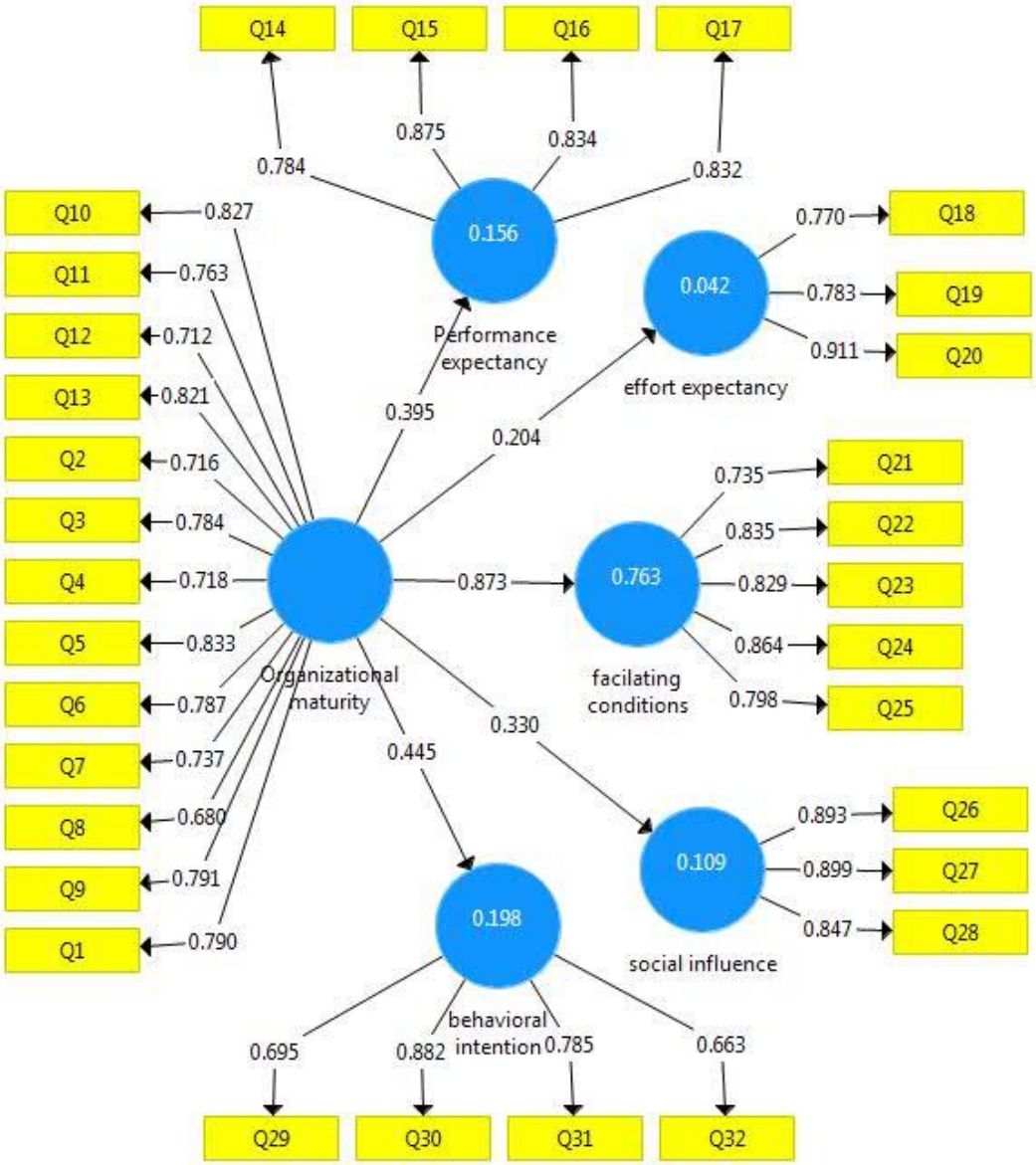

Figure 3: Confirmatory factor analysis, measurement, and structural model with values of standardized coefficients

The numbers inside the elliptical shapes are the coefficient of determination (R^2) index. The coefficient of determination investigates to what extent the independent variable describes the variance of a dependent variable. Thus, it is natural that this value is zero for the independent variable and above zero for the dependent variable. The larger this value, the higher the impact factor of the independent variable on the dependent. Therefore, it can be said that the organizational maturity variable describes 0.156 of the variances of performance expectancy, 0.042 of the variances of effort expectancy, 0.763 of the variances of the facilitating conditions, 0.109 of the variances of social influence, and 0.198 of the variance of purposeful behavior variables. The remaining percentage is related to the prediction error and may include other factors affecting this variable that have not been considered in this study.

Figure 4 illustrates the research model in absolute values of significance coefficients (t-value). This model tests all measurement equations (factor loads) and structural equations (path coefficients) using the t-statistics. According to this model, if the t-statistics value for paths is larger than 1.96, the path coefficient and factor load are significant at the 95% confidence level, and if the t-statistics value for paths is smaller than 1.96, then the factor load with the path coefficient is significant. Besides, if the value of the statistics is larger than 2.58, then the path coefficient and factor load are significant at the level of 99% confidence.

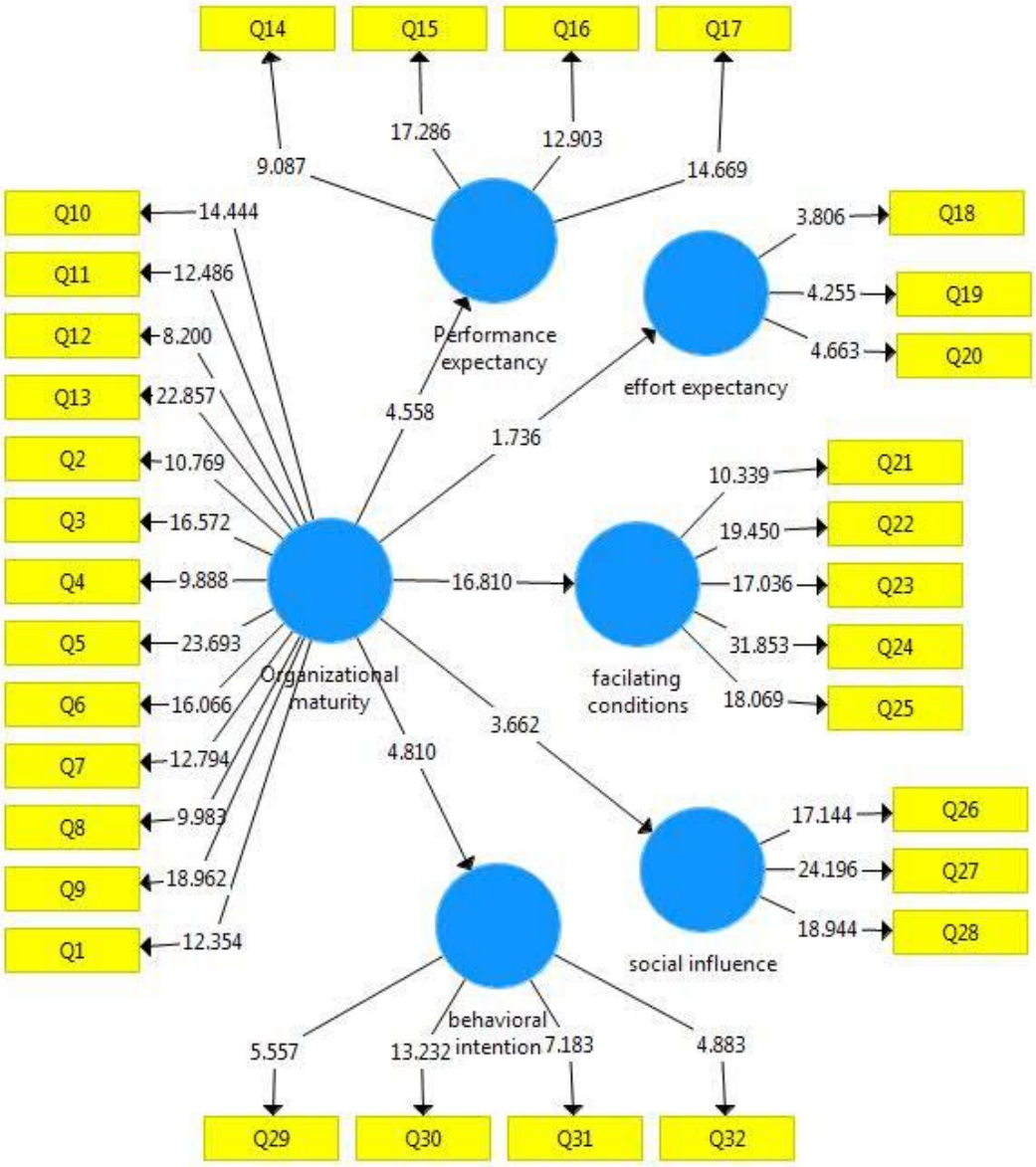

Figure 4: Confirmatory factor analysis, measurement, and structural model with values of significance coefficients (t-values)

Model fit indexes are one of the most important steps in structural equation modeling analysis. These indexes aim to answer whether the represented data model confirms the research conceptual model. To assess the fit of the measurement model and the internal consistency of

the measurement items, coefficients such as Cronbach's alpha coefficient, composite reliability, and the average variance extracted index should be taken into account, the relevant data presented in Table 1. The index used to evaluate the overall structural model in PLS software is the GOF index. This index is calculated by taking the chi-square root of the average intersection for all constructs and the mean R^2 for endogenous constructs. Based on specified R^2 and using a minimum value of 0.5 for the intersection rate, the GOF criterion is 0.25 is regarded as acceptable according to the sample, and values larger than 0.36 suggest a strong fit of the model (Wetzels, Odekerken-Schroder & Van Oppen, 2009). The calculated GOF value for the research model is 0.409, which indicates a very high fit of the model.

The main research hypotheses were tested by extracting confirmatory factor analysis data. According to the results obtained from standard path coefficients and significance coefficients with t-statistics (Figures 3 and 4), it can be stated that the organizational maturity variable has a significant and positive effect on performance expectancy at a 99% confidence level. However, since the coefficient between organizational maturity and effort expectancy is 1.736, it cannot be said that there is a significant relationship between organizational maturity and effort expectancy. It can also be said that the organizational maturity variable significantly and positively affects facilitating conditions at a 99% confidence level. In addition, according to the obtained coefficient between organizational maturity and social influence, it can be said that organizational maturity has a significant and positive effect on social influence at the 99% confidence level. Regarding the relationship between organizational maturity and purposeful behavior, considering that the significance coefficient or t-statistic value is 4.810, it can be said that organizational maturity has a positive and significant effect on purposeful behavior. Table 3 summarizes the test results of the main research hypotheses.

Table 3
Test of the main research hypotheses

Test result	P-value	Calculated t-value	Standard path coefficient	Path
Supported	<0.01	4.558	0.395	Organizational maturity > performance expectancy
Rejected	<0.01	1.736	0.204	Organizational maturity > effort expectancy
Supported	<0.01	16.810	0.873	Organizational maturity > facilitating conditions
Supported	<0.01	3.662	0.330	Organizational maturity > social influence
Supported	<0.01	4.810	0.445	Organizational maturity > purposeful behavior

Discussion

The Technology Acceptance Model (TAM) has been traced since 1989 (Yaseen & Zayed, 2012), and in this research, acceptance and use of technology among library and information science experts was the main aim of the research, and nowadays, the use of technology is an integral part of all individual and social activities.

It seems that in today's society, paying attention to technology and using it as much as possible is considered one of the indicators of sustainable development. In addition,

concentration and effective use of technology have led to more attention to the variables affecting the acceptance and use of technology in all fields of science. In the last two decades, Libraries and information centers, as social institutions, have tried to provide quick and easy access to information and resolve users' information needs by using various technological tools, such as OPACs, mobile applications, social networks, and Websites. The use of new technologies such as the Internet of Things and intelligent systems using artificial intelligence algorithms and natural language processing to better and more effectively communicate libraries with their users is a reason for this claim.

Although technology adoption and use in libraries seem acceptable, different variables can affect this situation. One of the variables that can have a significant impact on the acceptance and use of technology is organizational Maturity. Like other organizations, attention to organizational maturity is very important at libraries as social organizations. The process of organizational growth and maturity is rooted in the individual maturity of employees (Soltani & Bahrami Nejad Joneghani, 2010); and the commitment and obligation of individuals towards the organization (which have a significant impact on the performance and productivity of the organization's employees) also have an effect (Makhavarpour, et al., 2019); It can also be considered as an influential variable on librarians' behavior in accepting and using technologies available in libraries.

As observed from the research data, the organizational maturity of public libraries influences "performance expectancy, social influence, facilitating conditions, and purposeful behavior" components of library and information science experts working in libraries to accept and use existing technologies.

Although there has been no similar research in Iran about evaluating the impact of organizational maturity on technology acceptance models, it was impossible to compare the results of the present study with similar studies. As Daghighi Masouleh and Allahyari (2017) showed, the variable of organizational maturity has a direct effect on the variables of electronic readiness (organizational culture and structure). The other hand, the electronic readiness of the organization can be considered as a prelude to the acceptance and use of technology by the organization; it can be consequent that the results of the mentioned research in confirming the results of research indicate the effect of organizational maturity variable on the acceptance and use of technology.

Also, the variables of performance expectancy (the degree of personal benefit from using technology), social influence (other's expectations from the person to use technology optimally), facilitating conditions (provided infrastructures for using the technology), and purposeful use (or exactly actual use) depends on the individual and his characteristics and abilities. As mentioned above, organizational maturity is rooted in individual maturity, and individual maturity is derived from the abilities and skills that people in the organization acquire for growth and excellence, so, the effect of organizational maturity variable on the mentioned variables of the acceptance model and technology can be explained and justified.

Soltani & Bahrami Nejad Joneghani's (2010) results also indicate the effect of organizational maturity on organizational excellence and excellence. Considering that the use of technology is viewed as the fourth pillar of today's organizations, it can be concluded that organizational maturity affects the use of technology. These results can confirm the results of the present study. Also, Hassanzadeh Samarin, Habibi, and Saberi (2020) acknowledge in their research that the variable of organizational maturity is a mediating variable that affects

organizational performance and its internal and external strategies. These findings also confirm the results of our research regarding the influence of organizational maturity on library performance.

However, the organizational maturity of public libraries does not influence the component of "effort expectancy" of library and information science experts working in these libraries to accept and use existing technologies. It seems that the main reason is related to the subjectivity of this variable against the other variables that exist in the model of acceptance and use of technology.

The human mentality undergoes changes and transformations in different situations and times, on the other hand, the effort expectancy variable is the expectation and mentality of individuals from the ease of use of technology, so, as a variable rooted in capabilities and objective criteria of individuals and organizations, it seems that it cannot influence on organizational maturity.

Also, most respondents were 30-40, with 10-15 years of working experience and MA academic degrees. These factors are a strong reason for the appropriate conditions for the acceptance and operation of technology. These factors denote the appropriateness of conditions to accept and use technology. These conditions are the best platform for expanding the correct and rational use of innovations in public libraries and information science experts with organizational maturity.

Organizational maturity is an influential variable that affects the theory of acceptance and use of technology at library and information science centers, so investment in human staff to empower them to be rich and powerful causes the improvement of library and information science centers.

Conclusion

Since the elements of technology and human resources are an organization's main pillars, paying attention to human resources' capabilities in using technology can make an essential contribution to organizational growth and maturity. Saberi (2017) found that the skills variables of information literacy and digital literacy have a significant role in the acceptance and use of technology by influencing the cognitive variables of users. Accordingly, attention to improving the information literacy and digital literacy skills of librarians working in public libraries and determining the impact of these variables on organizational maturity can be considered by other researchers.

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Appendix: The questionnaire used in the research

		Almost Never True	Rarely True	Occasionally True	Usually, True	Almost Always True
1	The library director makes Processism on Business center					
2	Workers in the entire library are interested in Processism and try to advance this goal.					
3	The library director does his/her work in a process way					
4	The library director leads within the framework of the vision					
5	Teamwork with clients and partners has become a culture.					
6	Workers meet the client's needs through cooperation with each other.					
7	Workers are committed to providing services that exceed the client's expectations.					
8	Workers consider transformation inevitable.					
9	The library has units and groups to manage open design and transformation projects.					
10	Planning for change and innovation have become critical skills in the library.					
11	The model library has extended its transformation process to business partners' activities.					
12	The library's high committee is responsible for the progress of the process and the library's transformational performance.					
13	The mother organization cooperates with its librarians to coordinate between the businesses of the clients and the content providers					