

Survey effect of big data on performance improvement and the role of knowledge management in banking industry

Abstract

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Nowadays, information is important in our lives and production of a large amount of information in various fields has turned the present into the age of information, and teaching information literacy is the most important way to transfer the necessary skills in empowering people in the society to live in an information society. The current research aims to investigate the effects of information literacy on job performance with an emphasis on the role of knowledge management among bank employees. Considering that the current research aims to describe a specific condition or phenomenon, therefore, in terms of its nature and method, it is a descriptive-survey type of research, and from the point of view of the goal, it is considered as an applied research. Since it seeks to examine the relationship between two variables, it is considered a type of correlational research based on the structural equation modeling method. In terms of time and execution, it is considered a cross-sectional study. The measuring tool of this research is a questionnaire that has been distributed among bank employees. The data obtained from the questionnaire in two parts of descriptive and inferential statistics were analyzed using social science statistical software. The results obtained from this study showed that based on the linear regression findings, all the hypotheses of the research have been confirmed and therefore it can be said, investigating the impact of big data on performance improvement with emphasis on the role of knowledge management in the banking industry is effective.

Keywords: *information literacy, big data, job performance, knowledge management, banking industry.*

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Introduction

In today's transformed world where organizations are competing with as much power as possible, a huge part of the organization's energy is spent on paying attention to its employees because it has been just found that the employees of the organization, among other resources, are the main factor in improving the performance of banks and keeping them in the competition scene. In the bank, every person needs to be aware of his situation to progress and achieve the set career goals which this awareness makes him aware of the strengths and weaknesses of his behavior and used the necessary arrangements for the effectiveness of his activities. On the other hand, banks need to recognize the capabilities of their employees to improve the human resources situation based on that and thereby improve their service delivery and create positive developments in the process of their movements. organizational resources are heterogeneously distributed throughout the organization and their transfer between organizations is always costly that tremendous changes with the advent of new technologies have been made in the use of resources and this has caused the employees to be immersed in the turbulent search for information and therefore, with an emphasis on knowledge management, They should understand the value of information and always seek to learn practical technologies and improve their performance in the bank. Hence in the present study, an attempt is made to investigate the impact of big data on performance improvement by emphasizing knowledge management in the banking industry.

Statement of the problem

Big data is characterized as information assets with high volume, speed, and variety, and to convert it into value, special technology, and analytical methods are needed. So, bank employees should be ready to teach colleagues and clients the necessary thinking, new intelligence, creative observations, and use of financial information and prepare them for how to learn hence they can be seekers and consumers of financial information throughout their lives. In addition, employees in all subjects should have a correct and formal attitude with an effort to ask the learner and the process of asking him scientific questions, so that they can properly benefit from knowledge management arrangements. This means the transfer of several responsibilities in acquiring knowledge from bank employees to each other and allowing them to develop knowledge and policies to search for answers and formulate the results (Angeles, R., & Purdue, J., 2001).

The importance of learning and attention to knowledge management has always been emphasized by researchers and experts in the field of banking. Meanwhile, despite the importance and need for employees' awareness, evidence has shown that they lack the necessary information literacy in big data to pass some of their job requirements, let alone become lifelong learners. Due to this issue, we should pay attention to the performance of the members of this organization. Hence, It is necessary to examine the impact of big data on bank employees. The researcher's question is To what extent is big

data related to the improvement of banks' performance by the proper use of knowledge management?

Necessity of research

Nowadays, as economic relations become more complex and the development of bank exchanges with special characteristics, activists of the banking industry need to have special knowledge and abilities to face the problems and phenomena that arise in this type of society. Therefore, a new and evolved type of data flow is proposed in the form of big data. The 21st-century society is a learning society and the necessity of the survival of organizations in such a society is to equip employees with learning tools. Considering that information is the basis for the formation of knowledge in humans and its development, the process of acquiring knowledge, along with the attitude towards information and the skill of retrieving it, are the main defining factors of the information society and information literacy is considered as the building block of the 21st-century learning society (Kapoun, 2004).

Today knowledge is the center of most activities of organizations and access to information and its effective use for the organization is considered a basic principle in professional life (Perirukh, 2016). Since the flow of information has always been a human tool to know and be aware of the environment around him and help him interact with the environment, knowledge management also realizes the possibility of using the information to advance the affairs of banks by using the abilities and capabilities of the individual (Sarafizadeh, 2008). Human capital is of particular importance to natural and financial resources and in this system of thought, knowledge, information, innovation, and creativity have been recognized as the real sources of economic value creation. Given that organizations are facing an ever-increasing volume of information, It is understood that accessing the required information from the multitude of available information requires special skills, which is defined as information literacy, and bank employees who do not have these skills are constantly confused in the vast ocean of information (Keisha et al., 2019).

The increasing complexity in the working environments of banks causes employees to face various information options in their workplace and daily life that increasing complexity in the working environments of banks causes employees to face various information options in their workplace and daily life (Ghasemi, 2007). Given that in the past decade, there have been a lot of actions in different countries across the world, especially in North America, Australia, and European countries in the field of information literacy (Poornaghi and Abazari, 2007), Information literacy education are meaningful and necessary; Because life long information literacy learning

makes a person powerful in the cycle of experiences and actions (Sharkey, 2006). A person with the proper utilization of data can take effective measures to have a proper financial performance which has been the focus of financial experts in recent years. Banks also need to identify the extent of employees' benefit from big data in line with their work assignments and proper job performance. Therefore, the results of current research can also be effective in improving the performance of banks and consequently discovering the existing shortcomings in the field of financial and credit activities.

Theoretical foundations of research

Big Data

Nowadays, big data has various uses, whether it is in the form of structured data sets, which also have similarities with old data, or even unstructured data, during which new communication technologies and user-oriented operating systems are excelled (Lasley and Langley, 2016). Therefore, Big Data is getting bigger and more widespread every day. Indeed, a big data system will be effective for business when it deals with extracting useful and efficient knowledge to support relevant decisions (Turban et al., 2015). Predictive analytics can be used at high levels of big data to facilitate program execution in the form of a hybrid solution that can use both data and advanced learning solutions available in the organization (Hazen et al., 2014). To use big data, researchers have used new techniques to record, process, analyze, and consult on large quantities of data in a limited processing time. These techniques include various fields of mathematics, statistics, optimization methods, signal processing, learning the data extraction machine and machine learning, visualization, and pure analysis methods of social work (Chen and Zhang, 2014). In designing big data systems, logical layers provide an approach to organizing components that perform specific functions and since layers are just logical elements of a collection, it doesn't necessarily mean that the support functions of each layer are executed on separate work processes. So it can be said that big data solutions may be used as useful applications for use in financial systems (Sharda et al., 2015).

However, the potential benefits of big data adoption are often influenced by emotions, as far as by 2015, they fully considered the challenges of big data in their information strategies, they will outperform unprepared competitors by 20% in all financial metrics (Bair, 2011). Following such considerations, researchers have stated the following challenges about big data literature.

1. **Vagueness:** Current definitions of big data are expressed with vague concepts. Big data is a weak and even misleading term (George Haas and

Pentland, 2014) because it often refers to different volumetric thresholds. Therefore, some researchers such as George Haas and Pentland (2014) believe that the value of Big Data lies in its intelligence which means the amount of insight that can be extracted from new data sources and volumes. Because of this vagueness, companies that want to include big data technologies in their activities are trying to better understand the concept and therefore get business value from big data (Fio Wamba et al., 2015).

2. **Lack of managerial focus:** There is no clarity regarding the possible relationship between big data and financial metrics. Besides the lack of any empirical confirmation of this relationship, one of the reasons for the lack of clarity could be that "Most of the big data that has been addressed is not the output of tools which are designed to produce valid and reliable data that can be analyzed scientifically (Lazer et al., 2014). Consequently, current assessments of the potential return on investment in the field of Big Data may be unreliable and biased, or at least premature, and definitely, more research is needed in this area.
3. **Minor importance:** The growing trend, high volume, variety, and speed of data, has led to the evolution of information and communication technology, and it should not be taken for granted. What is changing is the intensity of the speed which has created management problems related to the utilization of new data (Fan et al., 2014). Furthermore, the volume of data that we are trying to use today has the possibility of different interpretations and needs a more exploratory and experimental approach to yield value (Jakic et al., 2015).

The aforementioned cases can strengthen the effect of big data, limit the transparency about the potential role of big data and probably have a detrimental effect on the selection of big data as an effective tool to improve bank performance. The decision to continue or not to invest in innovative information and communication technology is often influenced by new technologies as well as the expectations of users (Thompson, 2011). Bank managers should try to avoid confusion by evaluating the capabilities of big data and minimizing possible distortions and biases at the time of its use (Collin et al., 2010). To align management efforts and use big data, it seems that approaches solely dependent on big data technology may be misleading. Undoubtedly, Big data involves the use of technologies, but if banks are to rely on advanced data-driven decision-making, they have made a critical decision not only at the strategic level but also at the operational level. However,

in such a situation, the approach of producing, collecting, and exploiting new data sources can be more appropriate.

Job Performance

In today's changing world in which banks and financial institutions compete with each other for the power to attract depositors' capital, a huge part of the organization's energy is spent on paying attention to the bank's employees, because it has been just received that the people inside the bank are the main factor in remaining in the competitive scene, and their desired organizational performance is the main factor of success of the organization in moving towards the set goals. Decisively, a bank is successful in performing its duties and achieving its goals if it has the best people in addition to establishing an effective and targeted management system (De Lucca, 2008). In an organization, every person needs to be aware of his position to progress and achieve the set career goals. This awareness will make him aware of the strengths and weaknesses of his performance and behavior and take the necessary actions to make his activities more effective in the bank (Berati, 2019). Therefore, Banks and financial institutions need to know the efficiency of their employees to improve the situation of their human resources and thereby, increase the volume of their services and create positive changes in the process of their movements. On the other hand, people's attitudes are very important for organizational management because these attitudes affect organizational behavior, especially the attitudes related to organizational professional performance and commitment are among the most useful subjects in the field of organizational behavior and human resource management (Payne, A. and Frow, P., 2012). Performance is defined by the overall values expected by the organization from the individual pieces of behavior that each person performs during a certain period. Performance is a collection of employees' overall satisfaction with the activity environment, type of responsibility, human relations, organizational relations, and the level of occupational and organizational contexts. Motowidlo, J. S.(2003) has distinguished between task performance and contextual performance. That part of the performance that is included in the official job description is called duty performance and that part of the performance that behaviorally contributes to the effectiveness of the organization through the effect on the psychological, social, and organizational contexts of work is called contextual performance (Motowidlo, J. S., 2003). In the case of job performance, different views are presented. Job performance refers to the sum of the behaviors that people show about their jobs, or in other words, the amount of product is an outcome or return that is obtained due to the employment of a person in his job (Rashidpur, M., 2000).

In general, the effective factors on organizational performance can be considered as including organizational structure, organization environment, policies, and procedures of the organization. The use of organizational structure divides, groups, and formally coordinates the work. When managers seek to plan the structure of the organization, they should pay attention to six factors or main elements. These include division of work, grouping of work, chain of command, the scope of control, attention to concentration and lack of concentration, and finally, the formalization of unlimited tasks. The organization's environment comprises all factors that exist outside the organization's boundary and has potential effects on all or part of the organization. The policies that an organization implements regarding human resources play an important role in the formation and behavior of employees or members of the organization. The methods of selecting people are training programs, performance evaluation, reward systems, and the existence of labor unions. The job performance of employees in the organization can be considered from two innovative and standard dimensions. Standard job performance is related to the degree to which employees perform assigned organizational tasks. An organization that depends only on these predetermined tasks, is considered a fragile social system. To confront competition and environmental uncertainty, managers should increase their standard work behaviors through creativity, development, and understanding of new conditions and ideas for organizational changes. Hence, innovative job performance is considered a critical case for creative action by the organization (Mozen et al., 2010).

Knowledge management

Researchers have given many different meanings to knowledge management, on the one hand, it has been introduced as the organization of data, expertise, and experiences of employees; And on the other hand, they consider it as a balanced effort to obtain critical concepts, the ultimate goal of which it's ultimate goal will be to increase innovation, productivity, collaborations, serving customers and sharing knowledge and facilitating the flow of information, etc (Hosseini and Porasadi, 2010). The importance of the knowledge category has been growing in recent decades, which is due to the focus on knowledge as one of the organization's strategic resources. The ability of organizations to integrate and coordinate knowledge is considered one of the ways to achieve and maintain competitive advantages (Begum D., 2012). Drucker and colleagues (1999) consider knowledge as the most important resource in the 21st century. The first strategic step in knowledge management is to determine the amount and amount of business process data for its successful execution

(Lee, 2012). Blunt (2001) also believes that knowledge management is a process through which organizations use their collected information (Abtahi and Salvati, 2006). In general, the process of knowledge management can be considered to include knowledge identification, knowledge acquisition, knowledge development, knowledge sharing, knowledge exploitation, and knowledge protection. Studies in the field of comprehensive knowledge management indicate that knowledge management is a management science, not computer science, a knowledge system that connects people's real needs and goals, facilitates their real-world procedures, and their contacts and interactions have a higher chance of success than a system that follows workflow processes which opens a new path in knowledge management, towards collaborative management (Humes, 2005).

Knowledge is present at multiple levels of the organization. De Long and Fahy (2000) have divided it into individual, group, and organizational levels. Although people constitute only one level of the organization in which knowledge resides, Knowledge sharing among people is essential for creating, disseminating, and managing knowledge at all levels of the organization. Nonaka and Takeuchi (1995) acknowledge that without individuals, the organization cannot create knowledge, and without knowledge sharing among individuals and groups, knowledge will probably have a limited effect on organizational effectiveness. Lam (2000) defines individual knowledge as follows: A part of organizational knowledge that is based on the brain and physical skills of people includes all the knowledge that is under the ownership of people, but it can be used independently for special tasks. Because people have cognitive limitations in storing and processing information, individual knowledge tends to be specialized. At the individual level, Lavender, Rich, and Fasten Lacken (2001) introduce three types of knowledge that are important for creating value in organizations: Knowing how knowing why, and situational knowledge. Knowing how includes knowledge based on experience, which is abstract and implicit, and knowing why includes work-based knowledge that is objective. Situational knowledge is defined as individual knowledge that includes talent, ability, and competence.

Different types of knowledge management models

Determining how much knowledge a business process requires should be the first step in a supportive knowledge management approach. All knowledge management models can become the basic approach for knowledge analysis.

1. **Philosophical knowledge management models:** In the field of philosophers' research, philosophy investigates the nature of knowledge itself. Philosophical knowledge management models

consider knowledge as a separate entity created by the modeler.

2. **Ontology-based knowledge management models:** These types of models define knowledge exclusively through its relationships with a world of constructed discourses. They see knowledge as a black box with undefined inherent properties.
3. **Process-oriented knowledge management models:** These models focus on the characteristics of knowledge during its life cycle.
4. **Representative-centered knowledge management models:** These models focus on the characteristics of knowledge during its flow between people.
5. **Hybrid knowledge management models:** These models are based on the strength or weaknesses of two types of philosophy and ontology models.

Research background

The results of the studies of Soltani et al. (2012) Regarding the review of the performance evaluation system and the effect of cultural motivational factors on improving the performance of employees indicate that performance evaluation has had an impact on the performance of grain company employees in 12 regions of the country and also, the current evaluation system has acceptance and acceptability from the point of view of employees of grain company in 12 countries. In addition, The order of importance of motivational factors affecting the performance of grain company employees in the 12th region of the country is as follows: The priority: is the nature of the job, the second priority: is the identification factor, the third priority: the responsibility factor, the fourth priority: the growth and development factor, and the fifth priority: the success factor. Likewise, The order of importance of cultural factors affecting the performance of grain company employees in 12 regions of the country is as follows: The priority: is the factor of innovation, the second priority: is the factor of stability and stability, the third priority: the factor of attention to employees, the fourth priority: the factor of attention to results, the fifth priority: the factor of attention to the team, the sixth priority: the factor of attention to details and the seventh priority: the challenging factor.

Beckham (2012) conducted research under the title of promoting media and information literacy, a case study of the public sector of Bangladesh. The findings indicated that 58% of the research community believed that setting up a big

Table 1: Test of research hypotheses

Research hypotheses	Standard coefficient	The coefficient of determination	significant number	result
Big data affects the job performance of bank employees.	0/816	0/74	0/000	confirmed
Big data affects the knowledge management of bank employees.	0/87	0/78	0/000	confirmed

competition and having awareness in educational institutions is a way to improve the level of media and information literacy of the people. They get 45% of the information they need from the Internet. The necessary infrastructures for promoting media and information literacy are not available in Bangladesh. Furthermore, the majority of the research society believed that the government should strengthen media and information literacy to achieve a digital Bangladesh in 2012.

As a result of his studies, Hanis (2001) considers knowledge management as a process based on four pillars: 1- Content: which is related to the type of knowledge (explicit and implicit). 2- Skill: acquiring skills for knowledge extraction. 3- Culture: The culture of organizations should encourage the distribution of knowledge and information. 4- Organization: organizing existing knowledge (Abtahi and Salvati, 2006). Knowledge management is defined as a systematic and comprehensive approach to the sustainable improvement of knowledge management at all levels of the organization (Apple, 2002). Professionals and business managers agree that Technological issues, processes, people, and content should focus on knowledge management to achieve success (Pamarja, 2003).

Research method

According to the nature of the subject and the desired goals, the current research is of an applied type and has been conducted in a survey manner. The information required to conduct the research was obtained by using a questionnaire. The statistical population of this study includes 663 bank employees according to Cochran's limited population formula, the sample size examined in this study is 243 people. The random sampling method is simple and to collect research data, a questionnaire has been used, which includes 5 general questions and 52 specialized questions; Questions 1 to 16 measure big data variables, questions 17 to 32 job performance variables, questions 33 to 52 measure knowledge management variables among bank employees.

Testing research hypotheses

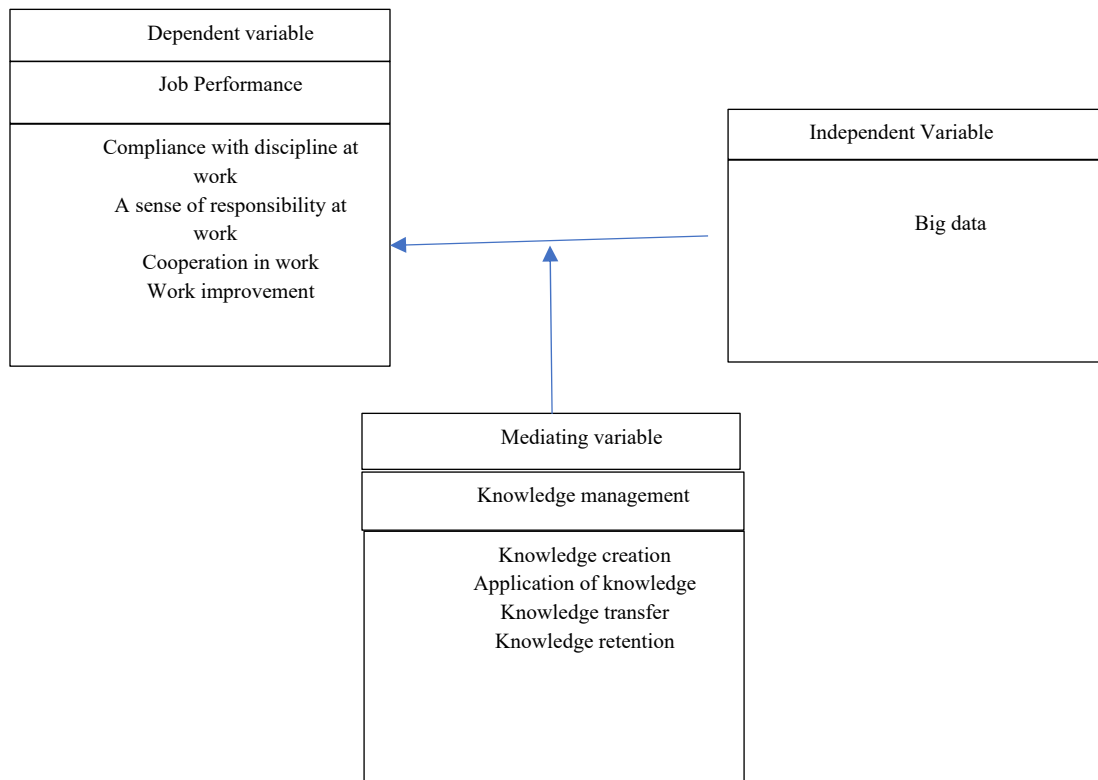
In the statistical review of the research data, the results related to the research hypotheses are shown in Table 1. These hypotheses are analyzed based on the statistics of the linear regression test and according to the significance level.

Knowledge management affects the job performance of bank employees.	0/73	0/6	0/000	confirmed
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According to the findings of the regression test for the first research hypothesis, the significance value is less than 0.05 and indicates the existence of a linear relationship between the use of big data by banks and job performance and in this way, big data has an impact on job performance. According to the standard path coefficient (β), the amount of macro impact on job performance per unit of increase in information literacy, and job performance; will increase in the same direction as 0.74 units. Hence, it can be concluded that recognizing information needs and effective use of big data by bank employees have an effect on compliance with work discipline and refrain from wasting time. The results of examining the second research hypothesis indicate the existence of a linear relationship between big data and knowledge management. The value of the adjusted coefficient of determination shows that big data explains 78% of job performance variation. So it can be said that diagnosing information needs and obtaining

Chart 1: Conceptual model of research

information effectively and efficiently is effective on the efficient and creative use of existing ideas and skills in identifying suitable solutions for upcoming issues in Sanandaj Municipality. The results of the regression test show a linear relationship between knowledge management and job performance and knowledge management affects job performance according to the standard path coefficient (β) equal to (0.6) which shows that for one unit increase in knowledge management, job performance; It will increase in the same direction as (0.6) units. Therefore, the third hypothesis of the research is confirmed, and identifying and allocating employees according to their expertise, skills, and availability for new projects has an effect on the job performance of employees and the sense of responsibility of employees towards the matters assigned to them in Sanandaj Municipality.



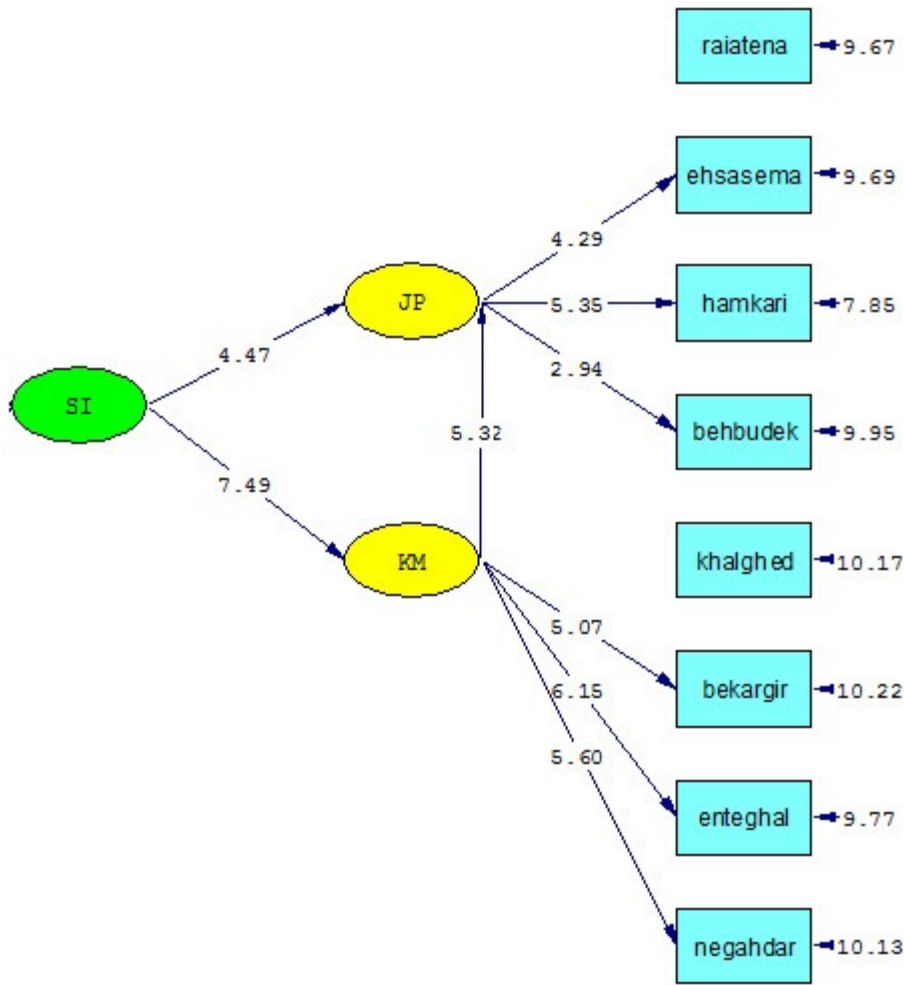
Examining model fit indices

The primary purpose of the utilization of the structural equation model is to find a theoretical model that has practical and statistical meaning. The general criterion for the partial least squares method is the GF criterion. The indicators of this

measure have a limit from zero to one and they are divided into four absolute, relative, internal and external model indicators. The internal model is the relationship between current variables or path coefficients and the external model is the estimation of factor loadings and factor analysis. Relative and

absolute goodness of fit indexes is both descriptive indices. If these indices are greater than or equal to 0.5, the model is

appropriate. As you can see, the relative goodness of fit index of this model represents the model's good fit.

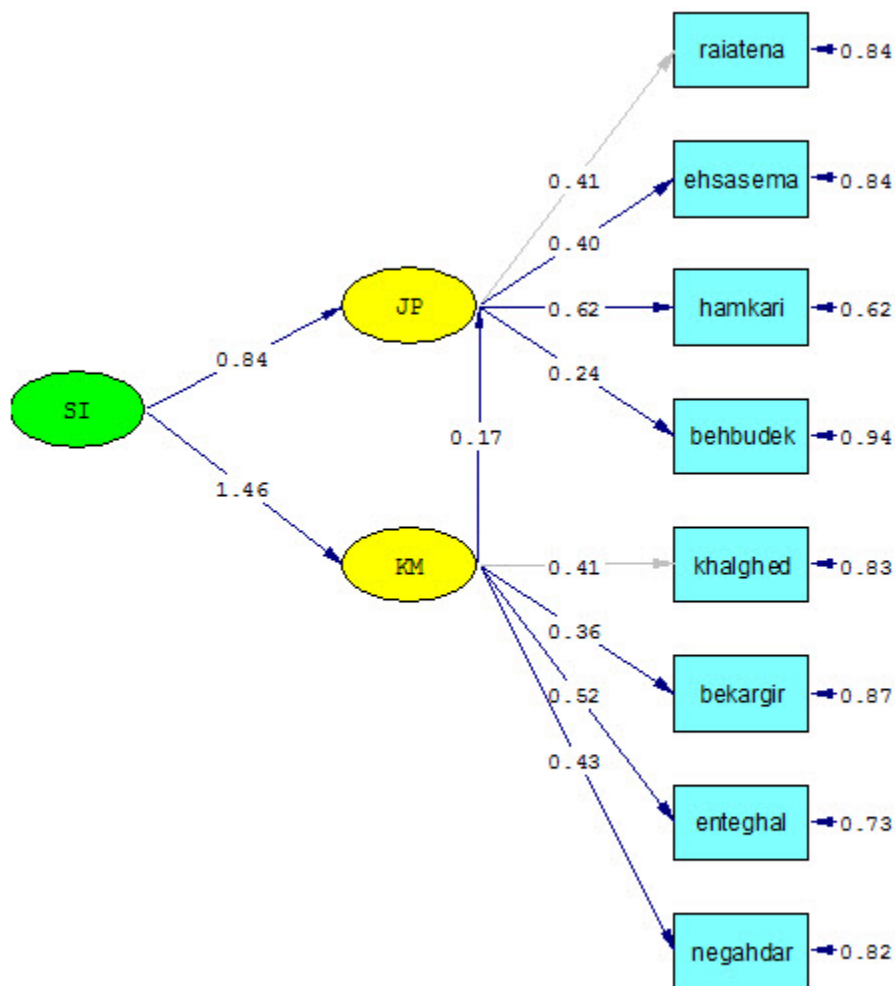


Chi-Square=102.56, df=51, P-value=0.05012, RMSEA=0.069

Chart (2). Significant numbers of the structural model of the research
Source: research data

In the chart above, significant numbers indicate the structural model. As shown in the chart, all the parameters estimated in the structural model are at the significant level and the signs of these parameters are all positive and show that the relationship between the latent variables with each other as well as with the observed variables is in the same direction which is pre-defined

according to hypothetical relationships. According to the obtained significant numbers and the values of the fit indicators; The model and data have an acceptable fit and thus, the validity of the assumed model of the research is confirmed. In chart 3, the standard estimation coefficients of the structural model are presented and show the effect of the variables on each other.



Chi-Square=102.56, df=51, P-value=0.05012, RMSEA=0.069

Chart (3). Standard estimation coefficients of the structural model
Source: research data

Results and suggestions

In the competitive world with the current stressful economy, achieving maximum productivity in the field of financial performance is not an ideal but a necessity, and banks, regardless of their size, to achieve this necessary goal have to improve their human performance and as a result their organizational performance. Researchers in the field of economics consider the increase in the efficiency of banks dependent on the increase in the efficiency of human resources. Increasing the efficiency of human resources also is subject to training, developing knowledge, and skills, and creating favorable behaviors for working. Effective and goal-based training and investment in bank employees lead to performance improvement. Job performance as one of the important attitudes in the studies of organizational behavior refers to efficiency and effectiveness in assigned tasks along with some personal data such as change and slowness in work.

In banks, each person needs to be aware of his position to advance and achieve the established career goals. This awareness makes him aware of the strengths and weaknesses of his behavior and takes the necessary arrangements to make his efforts more effective. Banks also need to recognize the efficiency of their employees to improve the situation of human resources based on that and thereby increase the volume of their products and services and create positive changes in the process of their movements. Multiple studies show that employees perform best in challenging, rich, and resourceful work environments, as well as environments that increase their enthusiasm. This means that banks should provide their employees with sufficient resources such as feedback, social support, and the opportunity to acquire diverse skills. Considering the role of human resources in bank productivity, examining and determining their job performance status, and knowing the factors that influence it has an important role in identifying the challenges ahead and improving the

performance of the organization. Human resources as the most important and valuable resource play a great role in the success of banks and can train employees and improve and change performance. Efficient human force can realize the goals of the organization and bring the organization to perfection by performing the assigned duties correctly it is not possible to maintain and survive the organization by continuing the wrong methods, the inefficiency of the managers, and the lack of motivation of the employees. Therefore, based on the results obtained from the research hypotheses, it is suggested to provide facilities for the employees to identify information needs, they will get to know information centers and be able to get a proper diagnosis of the nature of information sources, so that in this way waste of time is avoided in doing work, and occupational discipline is observed. Moreover, Due to the importance of the efforts of the bank employees in their efforts to comply with job discipline and maintain job secrets, it is suggested to establish a kind of friendly relationship between managers and employees and to prevent one-sided prejudices of managers during the evaluation of job performance to create this mindset in employees that their performance evaluation is done to improve their performance, not to reprimand them. Managers of different municipal departments should also pay attention to this variety of skills, autonomy, the speed of providing feedback, and giving importance to the assigned task can improve the job performance of bank employees through challenging and make comfortable working conditions and roles.

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