Design and Validation of Business Intelligence Model Based on Ambidexterity Approach

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Abstract

The purpose of this research is to design and validate the Business Intelligence Model (BIM) based on the ambidexterity approach. The research method is descriptive (non-experimental) and correlation research project is a structural equation type with the least squares. Participants in this study were employees of the Social Security Organization in Tehran. The participants in this study were the managers of the houses of municipality district of Tehran. In this research, the number of members of the statistical population is formed by 600 managers of the houses of municipality district of Tehran. Based on the Cochran formula, 234 managers of the houses of Tehran municipalities were selected as the statistical sample. In this research, a multi-stage cluster sampling method was used. To measure the variables of the research, a researcher-made questionnaire was prepared and adjusted. Research findings indicate that exploration management and organizational culture have a positive and significant effect on entrepreneurship orientation. Also, probe management and organizational culture have a positive and significant effect on flexibility. Further, the effect of entrepreneurial orientation and flexibility on exploratory intelligence is considerable as well as the impact of entrepreneurial orientation and flexibility on utilitarian intelligence.t. Having said that, however, the moderating role of technology absorption capacity in relation to entrepreneurial orientation and flexibility on exploratory intelligence and utilitarian intelligence is the subject that worth to be highlighted.

Keywords: Intelligence, Business, Ambidexterity Approach, District Houses.

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1. INTRODUCTION

Rapid population growth, coupled with urbanization, has created widespread problems in various countries, especially in developing countries. Lack of housing, unemployment, marginalization, traffic and other relevant problems are only some of the problems faced by urban managers. Solving these problems in the community requires the expansion of income sources of municipalities as the main pillar of city management. Today, one of the important issues of municipalities around the world is the creation of adequate sources of income and supplying the cost of urban services. In the meantime, urban management in most of our country's cities is also facing significant financial problems. The reduction or cessation of subsidies from the Ministry of the Interior, following the self-sufficiency law of the 60s, on the one hand, and the increase in demand for raising municipal incomes due to the rapid growth of the city, on the other hand, have caused instability in municipal revenue and their high dependence on the most volatile sources of income i.e. structural toll (Dasgupta & Lloyd-Jones, 2018).

Urban intelligence and the development of intelligent businesses can bring urban economics to the city of Sari. Intelligent growth means planning for the future. The world is full of examples of cities that have grown rapidly and without any special planning. The result of this lack of planning is, at best, anarchy and disorder, but this often prevents further development and brings low quality of life for citizens and, in turn, affects the environment. Therefore, urban managers should be futuristic and plan for demographic growth and change, and its effect on transportation, schools, hospitals and many other aspects of urban life. The term "intelligent city" has not been used extensively in the literature of spatial planning or urban researches, and it is still not fully possible to identify its various aspects as a principle for further elaboration of the details. It may be considered as technology, growth, or administrative laws and regulations. An intelligent city is more than a digital city. A city is intelligent when it is capable of linking physical capital with social capital in order to develop better services and infrastructure. When it is able to bring together technology, information, and political perspectives in terms of a coherent program and improve urban services. It is wrong to think that constructing intelligent cities need investment only in the field of IT (Information Technology); what cities need is the use of IT as a means of transferring local and national objectives and targets and levels (EU) (Sengers et al., 2018).

Intelligent businesses also grow within intelligent cities. In environments with high dynamics, there are characteristics such as rapid and discontinuous change in demand, competitors, technology, or laws and regulations that result in inaccurate and timely (EDITOR'S NOTE; do you mean 'untimely' here?) access to information, so that most of the information is inaccurate and obsolete. As a result, organizations need to rapidly develop their adaptive responses and expand the scope of data acquisition and gathering. Therefore, organizations are challenged by increasing the need for flexibility and agility measures; measures that start with the scanning, selection, and processing of information and continue to be

interpreted. Meanwhile, the increasing complexity of the environment requires organizations to consider heterogeneous factors and a wide range of actions, communications and interactions beyond the existing boundaries in their strategic decision-making (Dooley et al., 2018).

Business intelligence is a set of theories, methods, processes, architectures and technologies used to convert raw data into useful and meaningful information. Business intelligence is one of the management concepts that helps managers of organizations in the field of information management and realistic decision-making. Such systems, by analyzing the organization's information, can provide support and improve decision-making in a wide range of business activities (Pahlavan Nezhad, 2017). Today, business intelligence has become a valuable concept for organizations and companies that tend to increase the value of their decisions and gain competitive advantage. In fact, organizations align other paradigms with rules of business intelligence. One of the applications of business intelligence-based systems is the extraction and analysis of data from multiple sources such as enterprise resource planning systems, customer relationship management, supply chain management, administrative automation cycle, and business market intelligence to identify patterns and identify Issues (Melik Akhlagh and Haydar Niaye Kohan, 2013). Business intelligence is an active basic model and a vision-based strategy for discovering hidden cases, making large-scale decision-making on business data for better information in the business process (Cheng et al., 2018).

High levels of uncertainty and unpredictability in the organization's environment require more scanning and continuous processing of information. Under these conditions, it is unclear what the ultimate goals and paths for achieving those goals are, so that the organization must be ready to change and choose the best way to achieve its goals based on a constant basis. Hence, organizational backgrounds that are associated with increasing ambiguity and uncertainty will have important organizational and strategic challenges, especially with regard to organizational adaptation. In addition, the slow and raw response to sudden environmental changes will impose negative outcomes in terms of losses and costs to the organization (Ramirez et al., 2018).

Urban and institutional intelligent growth, rapid and unplanned physical development of cities and the consequent immethodical use of motor vehicles have brought about many environmental challenges in these places that result in increased environmental pollution and the elimination of agricultural land and a raise in the cost of urban infrastructure. Therefore, for the purpose of organizing such growth, modern planning patterns such as the ambidexterity approach are used. The focus on utilization (efficiency), regardless of exploration (innovation), makes the organization a competence trap. Therefore, it is assumed that successful organizations implement ambidexterity services in terms of integration, separation, cooperation and control, and formality and non-formality, meaning that in successful organizations the ambidexterity approach is made in such a

way that both integration and separation are considered. Also, the importance of cooperation is as much as control and the degree of formality and lack of formality is considered uniformly (Roldán Bravo et al., 2018). Business intelligence in the form of any definition seeks to increase the profitability of the organization by making intelligent and accurate decisions, and in general, the following requirements can be stated for this new approach:

1. Determining the business orientations of the organization, which will enable the organization to focus on its macro and basic goals without wasting time, costs and energy in other ways.

2. Deep market analysis.

3. Market forecasting that could generate new benefits to the market before competitors develop their market share.

4. Raising the level of customer satisfaction can lead to business continuity and loss of this trust and satisfaction will have consequences for the firm.

5. Strategic and macro orientations can be made by identifying durable and loyal customers and following their behavior.

6. Segmenting customers and subsequently creating variety in dealing with each customer group.

7. Increasing the efficiency of the organization in internal affairs and clarifying the trend of key processes.

8. Standardization and creation of compatibility between organizational structures.

9. Facilitate decision-making, which is one of the fundamental goals of business intelligence.

10. Early detection of risks before exposing the organization to serious risk and identifying business opportunities before competitors seize it.

With regard to the above, it can be said that the sense of the need for business intelligence in the organization is felt for the first time at high levels of management and is transferred from the upper pyramid of the organizational structure to the lower parts, but to create it, one must start from the lowest levels and layers (Safardoost., 2016). Managers rely on business intelligence to allow them to have their fingers on the pulse of corporate affairs, along with the current state of affairs, and with the use of up to date incident reports, they can have more opportunities to respond to the conditions resulting from rapid changes in the market and lead the organization in crisis situations to the target. Business excellence, like other management tools, can help a company succeed in the management of the company if it's taken care of and supported by senior managers of knowledge enterprises. Otherwise, like many organizational paradigms and numerous procedures, with the exception of consuming the valuable time of management of the company and its employees, will not have any yield. (EDITOR'S NOTE; maybe, it will not have anything positive to offer' would be better here) In today's situation, in which the business and economic conditions are rapidly changing, using business intelligence can be an umbrella for immunity of the organization against economic storms (Malek Akhlagh and Haydar Niaye Kohan, 2013).

Neighborhood houses in the municipality have numerous cultural and educational

activities that can play an important role in empowering citizens and the urban economy. Educational and cultural activities of the neighborhood houses, including citizenship education houses, holding screening bases (blood sugar tests and blood tests and PFT) to raise the level of health of citizens, activity of health houses, activity of libraries, stadiums, activities of welfare centers and social services, to promote the health of the community and to prevent social and cultural harm and to visit and communicate with cultural, artistic and scientific centers of the region. Regarding the studies carried out in the background of business intelligence based on the ambidexterity approach, there is clearly a gap in systematic scientific research in this field. The fundamental issue of the present research is what the Business Intelligence Model based on the ambidexterity approach actually is. The innovation of this research is that:

1. We have developed some ideas and suggestions on a Business Intelligence Model for developing Municipality, with more specific characteristics oriented to the generation of financial resources that help researchers, public research centers and institutions, including the Social Security Organization in Tehran, develop specific research and development projects.

2. The Article of a Business Intelligence Model has a very important characteristic for developing Business Intelligence in the Social Security Organization in Tehran. It is a system of innovation projects, with two alternative modalities for the exploitation of innovations and a collection system for the Business Intelligence. This design seeks to simultaneously benefit local R&D in the Municipality sector and improve market competitiveness.

2. THEORETICAL FOUNDATIONS

One of the basic ideas in organizational science is that the organization must be able to use its existing capabilities and at the same time seek new and essential capabilities, in addition to performing its previous tasks accurately. In initial researches that deal with this topic, the relationship between these two activities (exploration or utilization) is unacceptable, but in recent researches, ambidexterity organizations have pointed out that they can maintain their existing abilities, and at the same time, look for new opportunities. Marsh believes that utilization and exploration are two different learning activities where a company divides its attention and resources between the two. Utilization refers to activities such as "modification, productivity, selection, and implementation"; exploration refers to concepts along with "research, change, test, and discovery", and therefore, the necessity of exploration and utilization of organizational structures, are different strategies and organizational textures. Many scholars believe that there is an interaction between the organization's balance in utilizing abilities and exploring new abilities. Previous researches have usually claimed that achieving organizational measures that simultaneously explore and utilize is impossible, and so many of the contemporary management theories, have investigated the organizational phenomenon from the dimension of separate categories, and with

paradox and have forced companies to concentrate either on exploration or utilization (Reich and Birkinshaw, 2008).

In his article in 1991, Marsh holds the belief that the organization should be aligned with exploration and utilization simultaneously. Mere focusing on utilization may bring about short-term performance but can lead to the ability trap because the organization may not be able to adequately react to environmental changes, and, conversely, over-focusing on exploration can help the organization improve its knowledge base, but traps the organization in the endless loop of research and change. Levintel and Marsh (1993) conclude that long-term survival and success depends on the organization's ability to have "enough operation in the utilization of current organizational situations of the organization and activity in exploration to succeed in the future". Marsh's (1991) belief in the fact that successful companies are ambidexterity companies, led to a general shift in organizational research. Gibson & Birkinshaw (2004) defines ambidexterity organizations as an organizational capability in terms of alignment and efficiency in responding to market demands, while adapting to changes in the environment. They describe that at first, more attention was paid to structural ambidexterity. And now more attention is paid to the role of background history, informal networks and management-based background in ambidexterity.

Usually ambidexterity researchers are structurally investigated. According to Duncan (1976), who used this term for the first time, the organization manages the relationship between quasi-paradox demands by creating dual structures, so that business units focus on exploration, and other units focus on utilization. Duncan calls this mode a structural ambidexterity. Gibson & Birkinshaw (2004) believe that ambidexterity in organizational structure is enabled through "creating structural mechanisms to meet the quasi-paradoxical demands that the organization faces against equilibrium and its compatibility." Various opinions about the nature of these structural mechanisms are presented. One of these semi-structured views is that which enables the organizational unit to choose between two methods and the theory of complex structures that combine mechanical and organic structure components (Reich & Brikinsha, 2008). Recent studies point to the fact that ambidexterity can also occur in an organizational context (Gibson and Birkinshaw, 2004, Chang et al., 2009)

Jove (2011), in his research entitled "Success Key Factors for Business Intelligence Systems," reviewed factors influencing the success of business intelligence systems. The results of this study showed that management commitment, financial support, clear mission, developmental perspective, management of change, stable and flexible technical framework, and consistent and stable data quality are the main drivers of business intelligence success. A review of the determinants of the successful implementation of business intelligence dealt with the factors influencing the successful implementation of business intelligence. Their research results showed that the success factors of business intelligence are classified into three groups:

1- Organizational factors (management support and sufficient resources for functional and system support);

2- Project factors (employee participation, skilled team members and sufficient resources);

3- Technical factors (standard systems and development tools).

Issyk (2010) investigated the success factors of business intelligence in his research "The Success of Business Intelligence: The Empirical Assessment of the Role of Business Intelligence and the Decision Environment". The results of this research showed that two categories of factors affect the success of business intelligence:

1- Technological factors (data sources, data reliability, interactions with other systems and user access)

2- Organizational factors (flexibility, analysis and risk level)

Huang (2012) investigated the success factors of business intelligence in his research "Success Factors for Business Intelligence: Perceptions of Business Professionals". The results of this research showed that the two categories of factors affect the success of business intelligence:

1- Technical feasibility (organization technology, use of external data, appropriate hardware and software)

2- Operational feasibility (recognition and support of top management of the system, employee participation and coordination).

Olzak and Zimba (2012) in a study entitled "Success Key Factors for Implementing the Business Intelligence System for Small and Medium Sized Enterprises" in Poland, extracted criteria for successful implementation of these systems, which in order of importance are:

- Cost of system implementation
- Fit the needs of users
- Integration with operational systems
- Proper definition of business processes
- Ability to change and develop the system
- User friendly system
- The type of technology and its tools.

Issyk, Jones and Sidorova (2013) explored the success of business intelligence: the role of business intelligence capabilities and decision-making environments. The results showed that technological capabilities such as data quality, user access, and business intelligence integration with other systems are essential for the success of business intelligence. In addition, decision-making environments affect the relationship between the success of business intelligence and business intelligence capabilities.

Ho (2013) explored the factors influencing the use of the business intelligence system. The research participants were 339 Taiwanese electronics respondents. The results of structural equations showed that the ease of perceived use, perceived usefulness and adaptation have a positive and significant effect on the attitude toward the use of the business intelligence system. The influence of colleagues and the influence of the supervisor have a positive and significant effect on mental norms. Self-efficacy and facilitating conditions have a positive and significant effect on perceived behavioral control. Attitudes toward the use of business intelligence, mental norms and perceived behavioral control have a positive and significant effect on the intention to use

business intelligence. The intention of using commercial intelligence and perceived behavioral control have a positive and significant effect on the use of the business intelligence system.

Park et al. (2017) investigated the role of business intelligence and information technology on organizational agility. This study examines the role of business intelligence and communication technologies in how firms achieve organizational agility, agility of decision-making and action agility in different organizational and environmental conditions. In line with this approach, Fuzzy qualitative comparative analysis was used to analyze the data of field studies from different industries. The findings show that business intelligence has a significant effect on organizational agility, and the use of information and communication technology has a positive and significant effect on organizational agility.

Dooley et al. (2018) in a research identified a number of obstacles to business intelligence implementation. In this research, the failed projects of intelligent businesses were examined. The main objective of this study is to identify obstacles to the implementation of business intelligence in an organization, where suggestions are presented for further success through discovering previous and critical factors. The research findings indicate that factors such as business intelligence of company managers and employees, customer satisfaction and perceived value of the company play a role in implementing business intelligence. Jaklič et al. (2018) investigated the role of adaptation in predicting business intelligence and analyzing the use of intent. This study

examines the interplay of compatibility in predicting the use of business intelligence. The model is experimentally tested using the least squares approximation (PLS) through Structural Equation Modeling (SEM). The results show that adaptive perception has a direct positive effect on the goals, proves the effect of performance perceptions on goals, and the results also show that the use of intent in relation to compatibility and business intelligence plays an intermediary role. In brief, some of the two-dimensional effective studies can be identified according to the definition of the approach, the most important of which is presented in Table 1.

## 2.1. Source: Researcher Studies

In this research, after studying these researches, the conceptual model of the research has been developed (Fig. 1). As you can see, in this model, exploration management and organizational culture are considered as independent variables, and entrepreneurial orientation and flexibility as an intermediary variable, exploratory intelligence, and intelligent utilization as a dependent variable. The variable of technology absorption capacity plays a moderating role in the model.

2.2. Research Methodology

The methodology of the present research is descriptive (non-experimental) and the correlation research project is of structural equation type using the least squares because, in this research, relations between variables are investigated in the form of the causal model. Where there's a lot of data but there's not relatively adequate theoretical knowledge

Table 1. *Ambidexterity approach.*

Author(s)	Release year	Summary of results
Achrol	1991	Ambidexterity of access to innovation, flexibility and efficiency simultaneously
Tushman and O'Reilly	1996	The ability to manage gradual and sudden changes simultaneously indicates ambidexterity.
Benner and Tushman	2003	Ambidexterity is a kind of attitude in exploration and utilization innovations.
Gibson and Birkinshaw	2004	Ambidexterity based on conditions is known as adaptation and alignment.
O'Reilly and Tushman	2004	Structural ambidexterity is a kind of separation between exploration and utilization units.
Gratton and Erickson	2007	The leaders of task-oriented and relationship-oriented, dynamic environment
Sarkees	2009	Innovation, efficiency, mental security of human resources
Park et al.	2017	Use of business intelligence and organizational agility, organizational identity, absorption capacity
Dooley et al.	2018	Business intelligence of company managers and employees, customer satisfaction and perceived value of the company, participation in employee decision-making
Jaklič et al.	2018	Compatibility and perceptions of performance, management, market orientation
Wang et al.	2019	Intensity of competition, flexibility
Ortiz de Guinea & Raymond	2019	Technology absorption capacity, entrepreneurial orientation
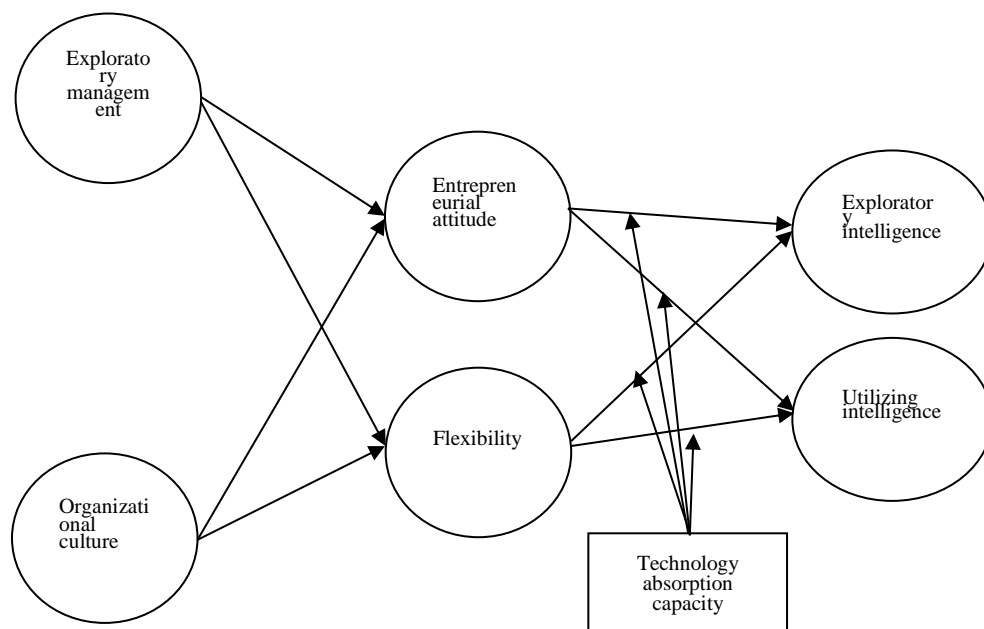
Fig. 1. Research model.

and suitable measuring tools China, Marcoline and Newstad (1996) suggest using this approach in various management attitudes, due to their high flexibility and lower limitations than the Lisrel method. In the present study, the least squares method is used due to the advantages of a covariance-based approach. Also, due to the applicability of the present study, according to China, Marcoline and Newstad (1996), the least squares method is more suitable for the purpose of this study. The participants in this study were the managers of the houses of municipality district of Tehran. In this research, the number of members of the statistical society is formed by 600 managers of the houses of municipality district of Tehran. Based on the Cochran formula, 234 managers of houses of Tehran municipalities were selected as the statistical sample. In this research, a multi-stage cluster sampling method was used. In this method, the main elements were selected in several steps. At first, several districts were randomly selected from Tehran, and then from each district, several neighborhood houses were determined, and then the sample elements from each unit were randomly selected. Generally speaking, in step-by-step sampling, at each step, a condition is placed on members of the community, thus choosing the sample. Based on this, 5 parts of Tehran, north, south, west, east and center of the neighborhood's houses of districts 2, 6, 8, 11 and 19 were selected.

To measure the variables of the research, a researcher-made questionnaire was prepared and adjusted. Fornell and Larcher (1981) propose three criteria for the study of the reliability of structures: 1) the reliability

of each of the two elements; 2) the composite reliability of each structure; and 3) the average variance extracted. Concerning the reliability of each item, the factor load of 0.6 and more of each item in the confirmatory factor analysis indicates the suitability of each of the components of that structure. Also, the factor load of the items should be at least at a level of 0.01 (Giffen and Eshtrab, 2005). To calculate the t-statistic, a Bootstrap test (with 500 subsamples) was used to determine the significance of factor loads. The Dillon-Goldstein coefficient (ρ_c) was used to investigate the composite reliability of each of the structures. Acceptable values of ρ_c should be 0.7 or greater. The third criterion is the reliability of the extracted mean variance (Fornell and Larcher, 1981). Fornell and Larcher recommend AVE values of 0.50 and more, which means that the structure explains about 50% or more of the variance of its markers (Chin, 1988). In Table 2, the factor loads, ρ_c, and AVE research variables are presented. The values of these tables indicate the sufficient reliability of the structures.

To assess the validity or divergent validity of structures, Chin (1988) recommends two criteria: 1. The items of a structure should have the highest factor load on its structure. That is, they should have a little cross-sectional load on other structures. Giffen and Eshtrab (2005) suggest that the factor load of each element on its structure should be at least 0.1 more than the factor load of the same item on other structures. The second criterion is that the square root of AVE of a structure should be more than the solidity of that structure with other structures.

Table 2. *Factor loads, combined reliability and extracted mean variance of the factor analysis of variables of the research.*

Measurement index	Exploratory management	Organizational culture	Entrepreneurial orientation	Flexibility	Technology absorption capacity	Exploratory intelligence	Utilitarian intelligence
Cronbach's alpha	0.80	0.89	0.89	0.85	0.90	0.88	0.79
ρ_c	0.87	0.82	0.90	0.80	0.79	0.84	0.86
AVE	0.65	0.58	0.65	0.57	0.56	0.59	0.63

Table 3. *Crossover factor burdens to verify the validity of questionnaires.*

Question/ Variable	Exploratory management	Organizational culture	Entrepreneurial orientation	Flexibility	Technology absorption capacity	Exploratory intelligence	Utilitarian intelligence
Q1	**0.83**	0.38	0.25	0.37	0.37	0.29	0.25
Q2	**0.92**	0.45	0.29	0.38	0.41	0.37	0.41
Q3	**0.84**	0.43	0.28	0.33	0.55	0.31	0.47
Q4	0.39	**0.87**	0.47	0.37	0.32	0.32	0.33
Q5	0.31	**0.82**	0.38	0.40	0.34	0.26	0.30
Q6	0.44	**0.81**	0.44	0.38	0.33	0.30	0.19
Q7	0.14	0.41	**0.84**	0.35	0.19	0.28	0.17
Q8	0.18	0.44	**0.72**	0.30	0.13	0.17	0.35
Q9	0.18	0.36	**0.72**	0.36	0.17	0.18	0.34
Q10	0.31	0.26	**0.67**	0.31	0.35	0.27	0.32
Q11	0.38	0.38	0.36	**0.80**	0.27	0.28	0.31
Q12	0.34	0.38	0.31	**0.82**	0.18	0.28	0.32
Q13	0.32	0.45	0.39	**0.78**	0.22	0.24	0.35
Q14	0.35	0.48	0.41	**0.85**	0.41	0.30	0.38
Q15	0.31	0.30	0.37	0.23	**0.80**	0.29	0.34
Q16	0.32	0.33	0.41	0.19	**0.86**	0.33	0.32
Q17	0.35	0.32	0.43	0.27	**0.84**	0.27	0.37
Q18	0.36	0.30	0.47	0.44	**0.87**	0.29	0.13
Q19	0.33	0.36	0.18	0.28	0.26	**0.69**	0.41
Q20	0.44	0.40	0.25	0.25	0.30	**0.84**	0.43
Q21	0.40	0.30	0.27	0.20	0.14	**0.85**	0.18
Q22	0.37	0.32	0.32	0.32	0.45	0.39	**0.79**
Q23	0.32	0.32	0.33	0.31	0.30	0.37	**0.85**
Q24	0.34	0.38	0.31	0.30	0.37	0.23	**0.81**

Table 4. Solidarity and ratio matrices eng variance extracted research variables.

Variable	1	2	3	4	5	6	7
Exploratory management	0.78						
Organizational culture	0.40**	0.79					
Entrepreneurial orientation	0.32**	0.41**	0.76				
Flexibility	0.35**	0.38**	0.42**	0.78			
Technology absorption capacity	0.36**	0.42**	0.39**	0.37**	0.76		
Exploratory intelligence	0.35**	0.29**	0.37**	0.41**	0.37**	0.77	
Utility intelligence	0.42**	0.39**	0.50**	0.43**	0.34**	0.31**	0.79
Average	3.42	3.21	3.87	4.02	3.12	3.54	3.54
Standard deviation	0.84	1.01	0.87	1.25	0.94	1.02	1.02

This indicates that the correlation of that structure with its markers is greater than its correlation with other structures. In Table 3, the cross-sectional load of items has been reported on research structures.

According to Table 3, all dimensions have the most factor load on their structure, and the least distance between the load factors for their structure is more than 0.1, which shows that the research structures have a proper validity.

3. RESEARCH FINDINGS

In Table 4, the results of the correlation study and the second criterion of the validity, i.e. the square root of average variance extracted are reported.

According to Table 4, the average mean square of variance extracted from all research variables is greater than their correlation with other variables. Therefore, the second criterion of the diverging validity of research variables is established. In addition, the numbers are reported below the diameter of the correlation matrix to examine the relationship between the variables. As seen, the coefficient of correlation between variables is positive and significant.

4. STRUCTURAL EQUATION MODELING TEST

In order to predict exploratory intelligence and utilitarian intelligence, the proposed conceptual model was investigated through structural equation modeling and according to the research hypotheses, the least squares method was used for model estimation. The Bootstrap method (with 500 sub-samples) was used to calculate T-values for determining the significance of path coefficients. The numbers in the circle of variance are explained by the variables of the research.

Figure 3 shows the coefficients of the research path. T coefficients above ±1.96 to ±2.58 are significant at the level of 0.05 and t-coefficients above ±2.58 are significant at the level of 0.01. Also, in Table 5, the estimated path coefficient and variance explained by the research model have been reported.
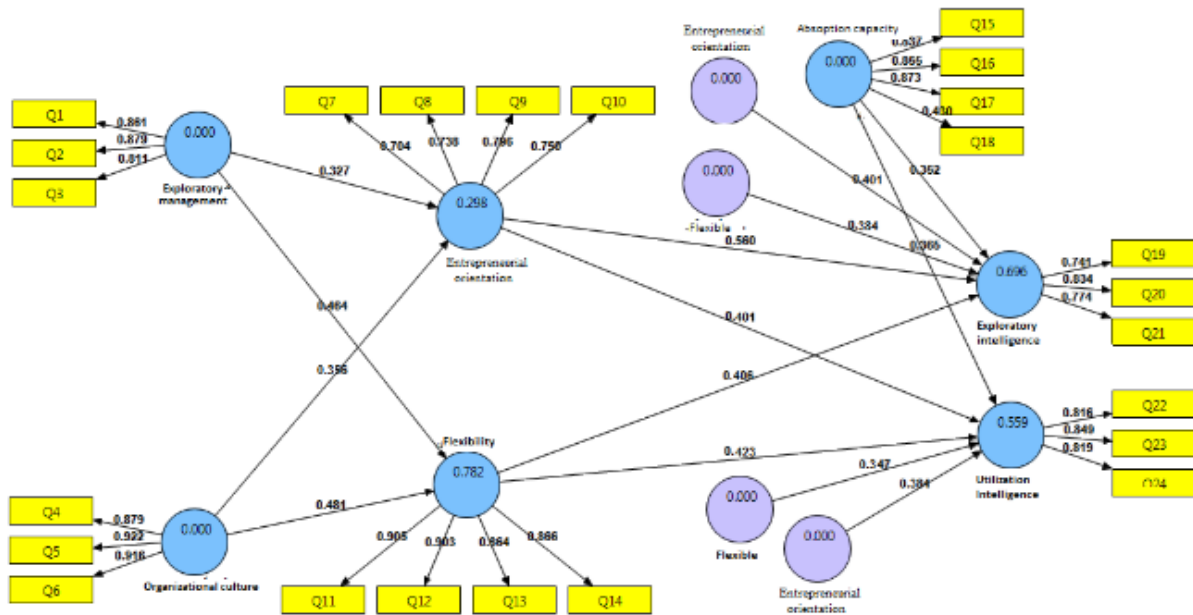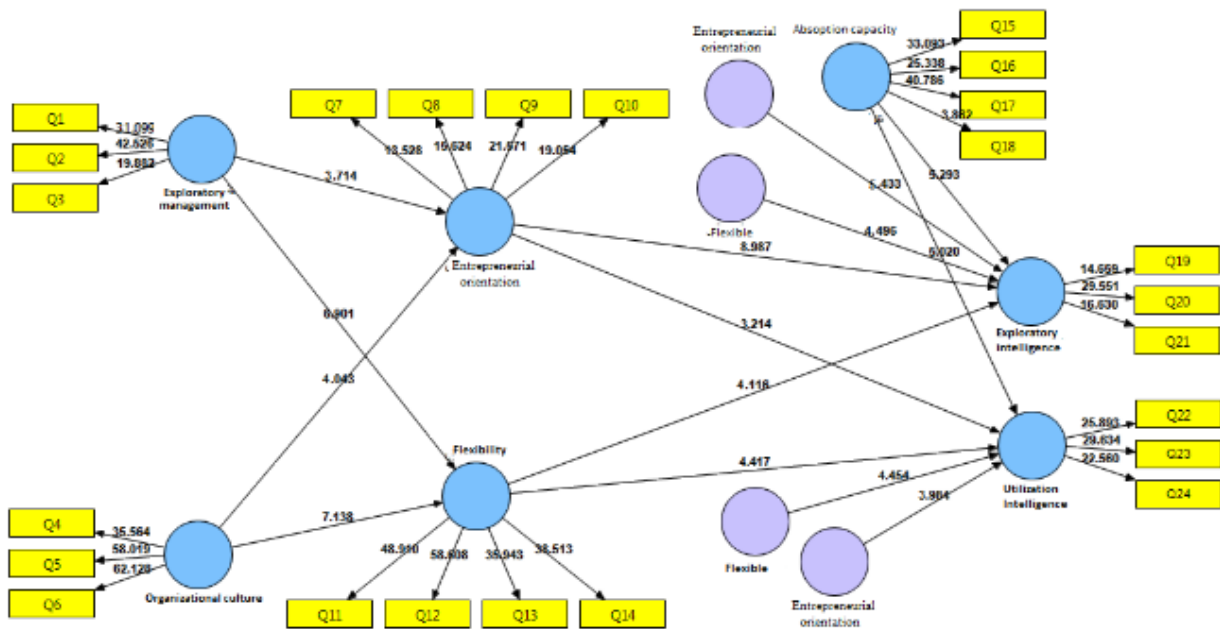
Fig. 2. Standardized research mode.

Fig. 3. The tested pattern of the research in significant t-mode.

According to Table 5, exploratory management and organizational culture have a positive and significant effect on the entrepreneurial orientation. Also, exploratory management and organizational culture have a positive and significant effect on flexibility.

Table 5. *Path coefficients and variance explained.*

Variables	Direct coefficients	Indirect coefficients	Variance explained
On the entrepreneurial orientation from:			
Exploratory management	0.32**	-	0.29
Organizational culture	0.35*	-	
On the flexibility from:			
Exploratory management	0.46**	-	0.78
Organizational culture	0.48**	-	
On exploration intelligence from:			
Entrepreneurial orientation	0.56**	-	
Flexibility	0.40**	-	
Technology absorption capacity	0.35**	-	0.69
Exploratory management	-	0.17**	
Organizational culture	-	0.20**	
On utilitarian intelligence from:			
Entrepreneurial orientation	0.40**	-	
flexibility	0.42**	-	
Technology absorption capacity	0.36**	-	0.55
Exploratory management	-	0.15*	
Organizational culture	-	0.19**	
On exploratory intelligence from:			
The role of absorbing capacity moderator in relation to entrepreneurship orientation with exploratory intelligence	0.4034**	-	-
The moderating role of absorption capacity in relation to flexibility with exploratory intelligence	0.38**	-	
On exploratory intelligence from:			
The role of absorbing capacity moderator in relation to entrepreneurship orientation with utilitarian intelligence	0.34**	-	-
The moderating role of absorption capacity in relation to flexibility with utilitarian intelligence	0.38**	-	

Also, the effect of entrepreneurial orientation and flexibility on exploratory intelligence has a significant effect. The effect of entrepreneurial orientation and flexibility on. entrepreneurial intelligence is significant. Also, the role of moderating technology absorption capacity in relation to entrepreneurial orientation and flexibility on intelligence and utilitarian intelligence is important as well

There are methods to examine the validity of the model in PLS. These methods,

which are referred to as cross-validation, include a CV-Communality examination index and a CV-redundancy examination index. CV-Communality index measures the model quality of each block. The CV-Redundancy index, also called the Q^2-Stone-Gaser, measures the quality of the structural model for each inbound block, taking into account the measurement model. The positive values of these indices indicate the appropriate and acceptable quality of the measurement and structural model. As shown

in Table 6, the positive values of the validity of the CV-Communality and CV-Redundancy for all variables in the present study indicate the appropriate and acceptable quality of the measurement and structural model.

In addition to the indices in Table 6, the index of pattern general Goodness of Fit in PLS is the GOF index and can be used to evaluate the validity or quality of the PLS pattern in general. This index examines the overall predictive ability of the model and determine whether the tested model is successful in predicting the endogenous hidden variables or not. In the present study, for the tested model, the GOF absolute fitting index, the value of 0.47 is obtained which indicates a goodness of fit for the test pattern.

5. CONCLUSION

Business intelligence facilitates communication within the organization and provides timely information for analysts at any horizontal and vertical level within and outside the organization. Business intelligence is the result of a thorough analysis of detailed business data which includes databases and applied technologies, as well as analytical measures. Business intelligence is technically wider and entails knowledge management, enterprise resource planning, decision support systems, and data mining. The purpose of this study was to design and validate the Business Intelligence Model based on the ambidexterity approach. The results showed that exploratory management and organizational culture have a positive and significant effect on entrepreneurial orientation. Also, exploratory management and organizational culture have a positive and significant effect on flexibility. Also, the effect of entrepreneurial orientation and flexibility on exploratory intelligence has a significant effect. The influence of entrepreneurial orientation and flexibility on

Table 6. *Validity of CV-communality and CV-redundancy of variables.*

Research variables	CV-Redundancy	CV-Communality
Exploratory management	-	0.821
Organizational culture	-	0.729
Entrepreneurial orientation	0.598	0.705
Flexibility	0.632	0.785
Technology absorption capacity	-	0.594
Exploratory intelligence	0.501	0.614
Utility intelligence	-	0.625
Flexibility * Absorption capacity	-	0.524
Flexibility * Absorption capacity	-	0.536
Entrepreneurial orientation * Absorption orientation	-	0.524
Entrepreneurial orientation * Absorption orientation	-	0.620

entrepreneurial intelligence should be taken to the account as well at the role of moderating technology absorption capacity in relation to entrepreneurial orientation and flexibility on intelligence and utilitarian intelligence. O'Reilly and Tushman (2008) believe that the perseverance and common vision of employees throughout the organization is a powerful factor in their participation in achieving ambidexterity goals, and this can be followed up and achievable when each person, in the organization, offers value to his customers in the context of his function, but at the same time it cares for changes in their work environment.

Confirmation of the role of the moderator of technology absorption capacity is consistent with the results of the research of Data (2011), and thus it is justified that technology absorption capacity focuses on identifying and absorbing knowledge outside of organization and along with concentrating on knowledge beyond the information available in the organization to identify the knowledge requirements needed by the firm from the environment for the organization. Dooley et al. (2018) in a study also identified obstacles to business intelligence implementation. The research findings indicate that factors such as business intelligence of company managers and employees, customer satisfaction and perceived value of the company play a role in implementing business intelligence. Jaklič et al. (2018) investigated the role of adaptation in predicting business intelligence and analyzed the use of intent. The results show that adaptive perception has a direct positive

effect on the use goals, proves the effect of performance perceptions on fixed goals, and the results also show that the use of intent in relation to compatibility and business intelligence plays an intermediary role.

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