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Identifying Barriers of Implementing BIM in Construction

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Abstract. New methods of construction projects to increase quality, reduce time and thus reduce costs have always been considered by construction engineers and stakeholders in the project. One of these new methods and technologies is building information modeling (BIM). The purpose of this study is to review and analyze the building information modeling (BIM) method and prioritize the factors affecting the challenge in establishing this system in the country. For this purpose, while determining the failure factors in the implementation of building information modeling system according to experts and through a questionnaire, the weight and importance of these factors were determined using the network analysis process (ANP) model and the factors were prioritized. The results obtained according to the opinions of experts and according to a binary comparison of the main criteria studied showed that the most factors that cause the failure of BIM in construction projects include technical, financial, human resources and time problems, respectively. Other results showed that four sub-criteria of information dispersion and lack of integrated system with a weight of 0.2277, complex program space with a weight of 0.1634, high design cost with BIM software with a weight of 0.1578 and the need for different office staff for a project weighing 0.1352 Sequence has been the most important and therefore the most influential in prioritizing the factors of BIM failure. By identifying the effective causes of the challenges of non-realization of BIM, preventive measures can be taken to prevent the failure of such projects and put them on the path to success. Considering the factors that have hindered the realization of BIM in construction projects, it can be said that building information modeling in construction projects needs the support of senior managers to implement it, which in itself depends on the reasons mentioned. Because by removing the obstacles in front of it, in order to optimally manage resources and time, etc., managers may be willing to use it.

Keywords: Building Information Modelling, Designers, Barriers, Construction

1-Introduction :

Today, with the advancement of technology, the use of computers to improve the design and documentation process between architects and other building-related engineering disciplines has increased significantly. In the meantime, the concept of BIM with building information modeling system is proposed as a new approach in master building based on modeling building components based on their data as a new approach at the level of developed countries. The building information model is a three-dimensional model that displays the physical and functional characteristics of the building digitally. This model is a common and reliable database for making appropriate decisions throughout the life cycle of a building. BIM information modeling technology, as a powerful tool in the hands of managers, improves project success metrics. Criteria such as cost, time and quality, despite the many benefits of this new technology, due to the island nature of conventional contracts, much of the potential lies in its use. Achieving sustainability in construction projects is not possible without modifying the construction design process and improving the quality of project products. At present, BIM technology is recognized as a modern and efficient tool in the field of building engineering that causes fundamental changes in all related fields. Has been under construction. Building information modeling technology

is a relatively new technology in the construction industry and can be a comprehensive answer to many problems facing the construction industry. This system, which uses the latest information and computer modeling methods to design, process and build software files for buildings, has created knowledge bases for buildings that, while producing virtual digital space, achieve Databases for buildings to facilitate and economical any possible change or repair and modification of the building in the future and during its operation (Ghamkhar, 2012).

This process is based on starting the design in the initial phases and the cooperation of different people involved in the project based on principles such as trust, transparency, efficient communication, open information sharing, team success equal to project success, equal risk and reward, decision based on values and The use of all technological capabilities and support is also formed. Finally, there is the possibility of better, faster and cheaper implementation, while reducing errors and wasting time and money during the project. The decision to use building information modeling is more commercial and business, protection or promotion of competitive position in the labor market, alignment and strengthening of business activities, are among the reasons that business managers generally defend the use of information modeling system Express buildings. For the successful use of the building information modeling system, the necessary arrangements must be made for the corresponding adaptation between this system and the culture of the community in the form of a cultural transformation strategy (Smith and Tardaev, 2007).

Successful managers of organizations and projects are well aware of the effect that building information modeling in the project can have on increasing productivity in the organization and accelerating project implementation. They have spared no effort. Considering the implementation structure of large projects, which is often done in the form of EPC and by a consortium of companies and organizations involved in project implementation, and the process model of project implementation, the importance of the need to use such systems makes clear to us. Regardless of the achievements and position of such systems in organizations and projects, the experience of deploying information systems, especially in this size, has been shown. The deployment of such systems has not always been successful and in many cases has failed and incurred huge costs to the organization and the project. Therefore, investigating the causes and factors affecting the failure and success of such projects is one of the solutions that can be a suitable model for other organizations to successfully establish building information modeling systems (Abedini and Maknoon, 2014).

Also, the high failure rate of information systems projects, which is also in the field of project implementation, has led many experts to look for the causes and factors affecting the failure of projects and the conditions that must be created for their success. Therefore, research on the failure of information systems deployment projects forms a significant part of the information systems management literature, especially in the last three decades, and this issue has been considered by many developed companies from different perspectives and dimensions. Research by Shah Hosseini et al. (2013) in this field indicates the complete success of a maximum of 20% of the information systems projects carried out in organizations during the two decades 1980 to 2000 AD, and in addition, 90% of technology investments. The information has not reached its intended purpose. Arzaghi and Sadatfar (2014), in a study discussed the concepts and functions of this technology in the country and some domestic projects. Khosroshahi and Araisi (2012), in their research, have examined the challenges and successes in establishing the building modeling information system of the Ministry of Health. Migilin Kass et al. (2013) in a study examined 22 key factors of corporate information systems in the project life cycle. Morrell et al. (2014) examined the success and key factors in building modeling information system and concluded that to improve the implementation of such a system, different levels of maturity should be considered in order to be able to Provided key performance indicators. Hyojo et al. (2015), in their research, examined the effective factors in the acceptance and proper use of building modeling information system and showed that among the various factors, the most important are management support, custom, adaptation to needs and soft existence. Is application software. In their research, Dongpin et al. (2015) examined the importance and necessity of using a building modeling information system in China and concluded that the success of using such a system depends on the project itself and, secondly, the support of the owner or Applicant, availability and type of desk software in China

have greatly influenced the success of this system. The purpose of this study is to review and analyze the building information modeling (BIM) method and how it relates to project management.

According to the US National Standards Organization, Information Modeling (IM) is the modeling of data in a design, including "digital representation of the physical features of the design" and a function of common features in all processes involved in the design to obtain complete information about Establishing a reliable center is the basis for decision-making throughout the life cycle of a project ”(Ham et al., 2020). Modeling, repairing, renovating, renovating, supervising the work of contractors, building installation services, appraisal, designing construction projects, etc., generally in a concept called "building information modeling" or "building data modeling" or "comprehensive structural configuration" In Latin terms, BIM refers to the modeling of building-related information that has been incorporated into scientific topics related to the construction industry in recent years and has made increasing progress. By definition, the data set that describes the construction and maintenance of a building over its lifetime is divided into a group of BIM-based systems. BIM fully covers geographic information, distance communication, geological information, building properties and capabilities, land use information, building maintenance and other related information. (Balstros et al., 2019). In other words, BIM must cover all the capabilities and capabilities related to the building throughout its life. In general, the structure of the building and the materials used in it, along with information related to the facilities used in the building are two major issues that are defined in the form of BIM (Sachs et al., 2018). The three branches of architecture, engineering and construction (AEC), which have always been separate, have gradually and over time, come together and created similar needs. This will save time and money in the construction of construction projects, will have a significant impact on improving the quality of the construction industry. Building information modeling is a term recently published by the AEC that models buildings in three dimensions (Kim et al., 2017). Building Information Modeling System (BIM) is an example of the latest 3D models to simulate the process of planning, design, construction and operation of construction projects that are used in the construction industry in many developed countries today. (Simply put: in this system, instead of conventional drawing, an example of a three-dimensional model including space, place and time in the design is made, which is used between all groups involved in a construction project. The main role is to create integration between the different teams involved in the project at all stages of the construction.This system helps architects, engineers and contractors to build what is to be built, first completely in one Create a virtual environment and overcome potential problems at any stage of construction such as design, implementation or operation (Zhang et al., 2018) 2. The concept of building information modeling (BIM) The concept of information modeling Building (BIM) is primarily the creation of a three-dimensional digital image of a building and the expression of its intrinsic properties. Information Modeling Building is the virtual process and function of designing and building a project throughout the life cycle of that project. All construction management activities, based on documents and contracts, are related to two categories of drawings and specifications, so that in these activities, the quantity of work is defined by drawings and its quality is defined by using technical specifications. (Dozi et al., 2019).

In fact, the criteria for evaluating the performance of contractors in construction projects are determined based on these two categories. Knowing that in the conventional method of construction management, on the one hand, plans and specifications are presented separately, and on the other hand, executive plans of different design groups are prepared separately but in coordination with each other, there may be many problems in All stages of the project will involve the teams involved in the project. The problems of this method are obvious to everyone and perhaps some of the worst of them are inconsistencies, mistakes and rework in the project, which in addition to increasing the cost of construction, will ultimately lead to lower quality of work (Dozi et al., 2019 One of the most exciting recent developments in the field of construction management is the introduction of construction information modeling technology. In general, the building information modeling system can be introduced in such a way that BIM adds 3D modeling components with special features to 2D drawings and their related specifications. Its special feature is that each member of the design shown in BIM, in addition to having a three-dimensional physical nature, carries with it an array of information about the various activities and tasks of construction management. This information is related to the whole life cycle of the project from the initial stages to its end, including the following: / Phase of explanatory

studies to conceptual design / Studies of the first and second stages / Procurement / Construction and installation »Launching 7 periods of operation and even the end Project (Ham et al., 2020).

Until the mid-nineteenth century, the general method of building design did not change much, and engineers used simple tools such as pens, paper, rulers, and calculators to design, calculate, and describe their buildings. However, with the advancement of evolutionary mathematics and computing on the one hand and the development of building materials on the other, the process of building design changed rapidly and improved rapidly (Kim et al., 2019). The Early Two-Dimensional CAD Method With the invention of the computer, two-dimensional CAD designs were adopted as a new design idea and tool in the AEC industry and developed rapidly. After World War II, American technology advanced rapidly in the field of civil engineering. The design page, or SKETCHPAD, was first developed by Ivan Sutherland, who was the root technology of CAD design (Azar et al., 2020). Initially, CAD technology emerged as the most popular design technology in modern times. However, with the advent of personal computers, the famous Autodesk company took a new step in the industry with the development of Autocad software. From now on, all architects and engineers around the world began to learn and use this type of design software in their projects (Azar et al., 2020). Beyond the 3D modeling system, the building information modeling (BIM) system has emerged as a powerful technology in the construction industry. Initially, this modeling system included all the functions of a 3D modeling system; 3D CAD modeling includes only a set of points, lines, 2D shapes and 3D volumes, while the concept of building information modeling, in addition to the geometric organization of a space, can be a symbolic concept with quantitative and qualitative data. Give that space. To compare the differences between older CAD documents and the building information modeling system, Leicht and Messner used these two methods to create and design a similar project called the Dixon School Building in the United States. Using this work, the many advantages of the BIM method over the old CAD modeling could be easily justified (Batikha, 2020). | With the approval and introduction of the building information modeling system, this modeling system quickly replaced other design systems in the construction industry. Building information modeling system is a new technology that has been adopted by some of the world famous construction companies in the design process. Today, the BIM system has become very popular among construction industry officials. In recent years, professional design companies and major builders of critical construction arteries such as the American Corporation (AIA), the American Society of Civil Engineers (ASCE) and contractors have been searching for the basic concept of using BIM for a better future. Technology has brought about a significant change in the design and implementation of construction projects (Badrick, 2020).

In general, in this study, we try to examine the factors affecting the challenge in establishing building information modeling systems (BIM) using the experiences gained in its deployment in similar companies, the weight and importance of factors Identified should also be considered to provide a model for other similar organizations that intend to use such systems. Because by identifying the effective causes of challenges, preventive measures can be taken to prevent the failure of such projects and put them on the path to success.

2-Research history:

Following the formation of the International Alliance Working Group in September 1995, three versions of the Inter-Industry Cooperation (IFC) Guidelines, including the Construction Industry, were published to build interoperability across industries (IAI); This was the beginning of a standard way to model data based on object-oriented models. Standards that defined interoperability through object-oriented modeling information in the AEC industry. Although after the development of these guidelines, a new arena was opened in the construction industry, but their development required the full support of the world's major software companies to be able to express themselves as much as possible in the field of industry (Hong et al., 2017). For the first time, utodesk, the company that has extensively designed most of the computer drawing software used in the building design industry, such as Autocad, decided to launch Revit software to begin new building information system (BIM) courses. Appeared.

Building information modeling is a type of brand new design method that was defined in 2004 by Autodesk as follows:

Methodology of designing a building and documenting it by creating and using consistent, computable, continuous and appropriate information about a design and construction project "Building information modeling system including the use of 3D visualization techniques with time, information and imaging Object-based, which can be used as a useful tool in various industries (Chao et al., 2018), this system is able to greatly increase the user's ability to control and manipulate data and information in the project process. Information from paper to computer and its conversion into parametric data and information based on digital modeling, means that digital design in BIM system can be used to estimate costs, simulation process, planning, energy analysis, structural design, Use Geographic Information System (GIS) integration, construction, installation and equipment, and equipment management of a building, etc. Since all information in the BIM modeling system is dynamically interconnected and this information interacts with each other, thus increasing interest Laterality and efficiency in the project is one of the main advantages of this system Using a computer program for modeling, the designer is able to take responsibility for simple and general changes and even internal calculations in the project process.

2-1- Patterns of objects and components in a BIM model

BIM is based on patterns of two- and three-dimensional parametric components and objects to provide the most accurate model of a building's available information. In many cases, these patterns represent building components such as HVAC equipment and must be provided by manufacturers to provide the most accurate profile. While it is possible to use a general pattern, BIM is incomplete unless it is the exact pattern of the manufacturer. In general, manufacturer websites are a relatively good source for finding patterns and other items for BIM. But given the number of components and the number of manufacturers that produce those components, manually searching for BIM templates on a manufacturer's website is tedious. There are many websites that provide many templates and components for BIM through library resources. Popular websites for this purpose include BIMworld Autodesk or MHSN (Mcgraw Hill Sweets Network) (Lee et al., 2018).

2-2- Using building information modeling system (BIM)

Although architects and design engineers are known to be the main beneficiaries of the Building Information Modeling (BIM) system, it must be acknowledged that the new construction industry is also very interested in this area. This issue is becoming more widespread, especially in construction projects in developed European countries and the United States. The BIM system gives contractors a tremendous opportunity to plan their implementation methods and equipment before they start splitting the project site (Ham et al., 2020). Using this system, the entire executive team involved in the project, including the main contractor, subcontractors and project builders, can work together, using virtual simulation of the construction process, to practice execution sequences, scaffolding locations, elevators and management. Project site, etc. and evaluate the effects of their decisions before implementation. Before the 1970s, building plans were drawn in pencil, ink, and paper. In addition, calculations related to the structural part of a construction project were performed using a calculator. Therefore, correcting map errors was very difficult, and especially if the errors affected other dependent maps, the result was in some cases even terrible. In the above decade, two-dimensional computer drawing methods called CAD were developed that could only be applied to the graphical terminals of central computers (Park, 2020). In general, a BIM model is technically a CAD model that is connected to a database, so that any project-related information can be stored in it. Thus, a BIM model acts as a common source of information between the entire building design and construction team. The result of this information integration is increased coordination, reduced errors and waste, and ultimately increased quality of work. It should be noted that the following sections provide a more complete explanation of each of these advantages and differences between a three-dimensional BIM model and a two-dimensional model (Turn, 2018). 6- Design in building information modeling system (BIM) (As mentioned, the concept of BIM is beyond CAD and BIM model is actually a database-based modeling system. In BIM system, the design process by building a model consisting of intelligent components Which represent doors and windows, ceilings, beams, stairs, air conditioning, wiring, etc. These components know both

themselves and their relationship to other components in detail, so the designer and executor for information In the case of a specific component, such as a window, such as size, glass material, frame, etc., it is not necessary to turn over several plans, cuts, facades, etc., and it is enough to refer directly to the component itself. The component stores all the information about its features and adapts itself to the new design by making any changes in its properties. BIM acts as a central core in the production of the building and other related factors such as architects, civil engineers , Structures, mechanical and electrical systems, builders and executors of the project and finally the owners are considered as marginal elements using it and in coordination with It is related (Cat, 2020). Brown et al. (2020) state in their research that cost-management and use of BIM in the construction industry has proven that the contractor's construction management skills and any decision and performance at this time directly affect the project costs. Affects. Chou et al. (2019), in a study entitled Building Information Modeling in Project Management, analyze the construction capabilities of project systems, predict the cost and time of projects at any time using quantitative cost estimation software, and Using illustration and joint construction teams, he designs a big picture of the project. All of this is in line with what a project manager does on a different scale during a project life cycle. The purpose of this study was to show the relationship between building information modeling and the role of project managers in construction projects. This study emphasizes the importance of knowledge and experience of building information modeling for the success of project managers. Also in this research, the requirements of enriching the knowledge and experience of project managers about building information modeling were discussed. Gorla et al. (2017) define building information modeling in construction project management as value and compliance with specifications and estimation of customer expectations. Their studies also showed that organizational factors are more important than technical factors in the product quality of information systems projects. Edin (2017), in his research entitled "Life cycle of the construction project" in the results of this study has shown that 30% of construction costs are wasted due to errors, inconsistencies, waste and inefficiency of forces. Those involved in the construction process are constantly challenged to deliver successful projects despite limited budgets, limited manpower, fast schedules, and limited or conflicting information, and with the help of BIM, a capable contractor Is to better coordinate the project work activities, resulting in a safe environment with the least mistakes, rework and waste, as well as the highest profit and lowest cost.

2- Materials and methods

2-1-Research Methods

The present research is applied in terms of type and descriptive and survey in terms of implementation method. The purpose of this study is to investigate the factors affecting the failure of building information modeling in project-based organizations and is an applied research that can play an important role in implementing the building information modeling system in project-based organizations by determining these factors. . Also, this research is of exploratory type and library and field method (completing the questionnaire) was used to collect the required information and data. Interviews with construction project management information system experts were also used to identify the factors behind the failure of the establishment of building information modeling, and then the findings were described and designed using measurement tools and sent to experts to extract effective factors. The challenge of establishing a building information modeling system was created. The ANP network analysis process method was used to rank the factors agreed upon by the experts. In general, this study intends to investigate the failure factors in the implementation of building information modeling system and using the ANP technique to determine the weight and importance of failure factors in the implementation of BIM in the country and in fact by determining the weight of each factor Prioritize each factor in terms of degree of importance through the ANP network analysis process model.

2-2-Collect data and required information

Network analysis process is another series of decision-making techniques and if the criteria are not independent of each other, this method is used and can be used when the decision-making action is

faced with several competing options and decision-making criteria. The criteria proposed in the mentioned method can be quantitative and qualitative. The basis of this decision-making method is based on pairwise comparisons. The network analysis model, which is a generalization of AHP, was first proposed by Professor Saati in 1997. In cases where lower levels affect higher levels or elements that are on the same level and are not independent of each other, ANP is used instead of AHP and is a more general form, but does not require a hierarchical structure and in The result shows the more complex relationships between different levels of decision networking and considers the interactions and feedback between criteria and alternatives. The network analysis process consists of four main steps, which are:

1) Building models and structuring independent.

2) Paired comparisons and priority vectors that in the network analysis method as well as the method of hierarchical analysis of decision elements in each part or due to their importance in benchmark control are compared in pairs and the parts themselves according to their impact on the goal. Paired faces are compared.

3) Formation of a hyper matrix

4) Choose the best option.

Variables studied and how to measure variables

Causes and factors of failure and success of organizational projects include intra-organizational factors and extra-organizational factors are research variables. In the present study, after studies on the project management information system and building information modeling, the factors affecting the challenge around the mentioned topics have been investigated. After identifying the factors affecting the failure of building information modeling in project-oriented companies, the final extraction of effective factors with the opinion of experts and building information modeling through a questionnaire to examine the significant relationship between factors with failure of building information modeling and then prioritizing Factors were analyzed through network analysis process (ANP) model and the data collected in Super Decision software were analyzed.

Methods and tools of data collection

In order to collect information, library studies, interviews, questionnaires and field visits have been used. The statistical population in this study included managers and experts in the field of establishing building information modeling in project-oriented construction organizations, which was done in a targeted (unlikely) and chain-based manner with the participation of people who have knowledge and expertise in research. . Also, the data were quantified using Likert scale at a distance and to identify and prioritize the measures taken in several projects implemented in civil engineering projects, simple random sampling was performed. To describe and analyze the information and after preparing the initial model, to assess its validity, a questionnaire and specialized comments of selected experts were used and reviewed and applied by the network analysis process method. For this purpose, a structured interview was conducted with 10 experts and by examining their opinions, the most important factors were categorized. For ANP analysis, 15 experts and specialists were used to compare pairs and determine the weight of factors.

3- Results

3-1 Determining the factors of non-realization of BIM in construction projects

According to the studies conducted and the supervision of relevant experts in this study, the factors of failure and non-realization of BIM in construction projects were divided into two parts: main criteria and sub-criteria, which are shown in Table 1.

Table 1- Main criteria and sub-criteria for non-realization of BIM in construction projects

Sub-criteria	The main criteria
High design cost with BIM software	Financial
The cost of training key and relevant people within the workshop	
Dispersion of information and lack of integrated system	Technical
Increasing project reset in execution phase and decreasing decision accuracy	
Complex application space	
Introduction of new technologies in the field of construction	
Increasing tensions between employer and contractor	
Need different office staff for the project	human resources
Need for project management and control personnel	
Reduce reporting speed, check status and project delays	Time

3-2 Determining the criteria and calculating the weight and rank of the criteria

After determining and specifying the main criteria and sub-criteria for non-fulfillment of BIM, it is necessary to determine the relationship between these factors (main criteria and sub-criteria), for which the opinions of experts are used. Unlike the AHP hierarchical analysis process, in which the relationship between criteria, sub-criteria and options is hierarchical and one-way, in the network analysis process, in addition to hierarchical communication, in some parts of the model criteria and sub-criteria may be related to each other. And be interdependent, as in this example where criteria and sub-criteria are interrelated.

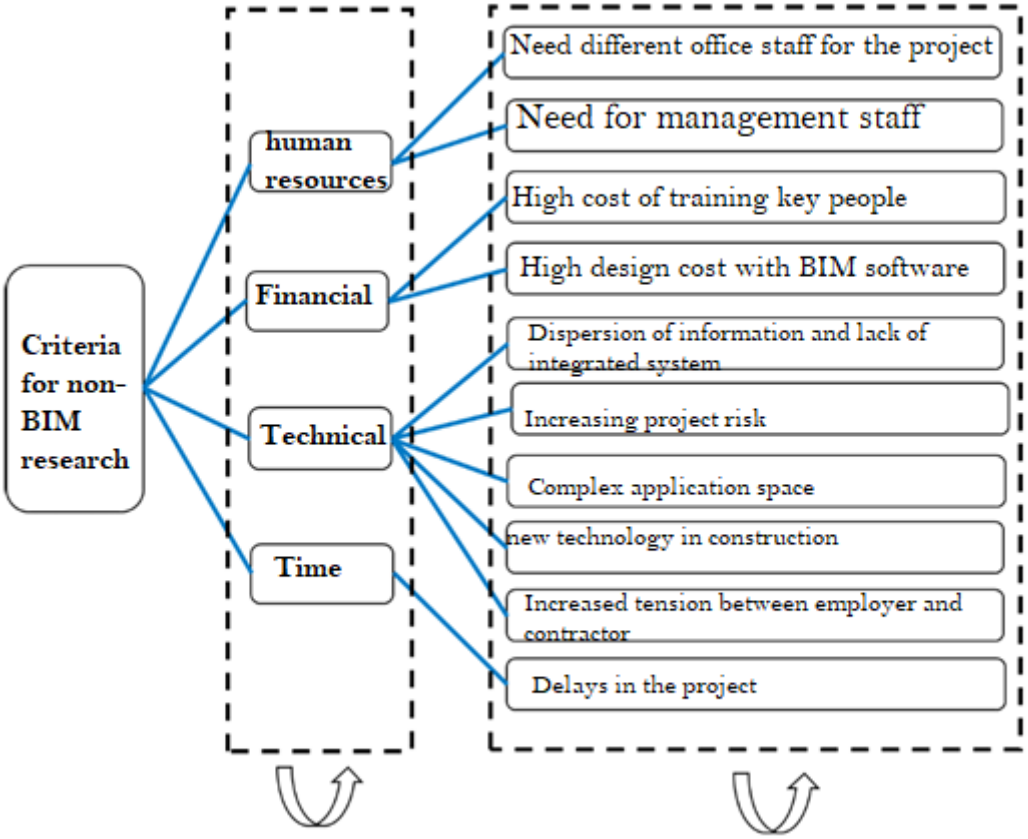

Figure 1 - Relationships and dependencies between criteria and sub-criteria in Super Decision software

3-3 - Determining the criteria and calculating the weight and rank of the criteria

According to the opinions of experts and studies conducted in this study, according to the binary comparison of the main criteria (Tables 2 and 3), respectively, the most factor that causes the failure of BIM in construction projects is technical problems (technical criteria) . For example, the lack of an integrated system and the lack of comprehensive BIM software in all contracting companies are the main reasons for the non-realization of BIM in construction projects. The next influential factor is financial problems (financial criteria) such as the high costs that human resources receive for designing with BIM software. The third factor in the non-realization of BIM in construction projects is human resource problems (human resources criterion). For example, the lack of specialized personnel in working with BIM software, which is a sub-criterion of the main criterion of human resources, is one of the challenges facing the realization of BIM. After prioritizing the above and determining the priority of the influential factors in the occurrence of problems and creating challenges in the realization of BIM in construction projects, the next factor and the fourth priority according to the classification done in this research, time standard time problems such as time consuming information integration In different parts of the design.

Table 2 - Binary comparison results of the main criteria studied

Special vector (M)	**Time**	**Technical**	**Financial**	**human resources**	Target
0.180	-	-	-	1	human resources
0.309	-	-	1	→ 1.9	Financial
0.381	-	1	→ 1.3	→ 2.2	Technical
0.129	1	↑ 2.7	↑ 2.3	↑ 1.6	Time

Table 3 - Prioritization of the main criteria studied in the present study

In BIM construction projects, the degree of priority of the impact on non-realization	**Special vector (M)**	Criteria and purpose under consideration
3	0.180	human resources
2	0.309	Financial
1	0.381	Technical
4	0.129	Time
-	1	total

Based on the results of studies conducted in the field of determining and prioritizing the criteria for non-fulfillment of BIM in construction projects and according to the results of weighting the studied criteria (Tables 4 and 5), four sub-criteria of information dispersion and lack of integrated system with Weight 0.2277, complex program space with a weight of 0.1634, high design cost with BIM software with a weight of 0.1578 and the need for different office staff for a project with a weight of 0.1352, respectively, the most important and therefore the most effective in prioritizing the factors of failure They will have BIM.

Table 4 - Weighting of criteria for non-realization of BIM in construction projects

Limited weight	Normalized weight	Ideal weight	Sub-criteria
0.157806	0.157806	0.69286	High design cost with BIM software
0.048551	0.048551	0.21317	Increasing tensions between employer and contractor
0.089471	0.089471	0.39283	Increasing project risk in the implementation phase and decreasing decision accuracy
0.16344	0.16344	0.7176	Complex application space
0.041014	0.041014	0.18008	Need for project management and control personnel
0.135293	0.135293	0.59402	Need different office staff for the project
0.053653	0.053653	0.23557	The cost of training key and relevant people within the workshop
0.024625	0.024625	0.10812	Introduction of new technologies in the field of construction
0.22776	0.22776	1	Dispersion of information and lack of integrated system
0.058387	0.058387	0.25636	Reduce reporting speed, check status and project delays

According to the normalized weights of the studied sub-criteria extracted from Super Decision software, prioritization in terms of importance and determining the priority and effectiveness of the mentioned sub-criteria in non-fulfillment of BIM has been examined and the results are presented in Table 5. As mentioned above, according to the results (Table 5), the sub-criteria of information dispersion and lack of integrated system is the first important and effective priority in the non-realization of BIM in construction projects. Therefore, this challenge facing the building information modeling system (BIM) in construction projects should be further investigated and necessary measures should be taken to address this and other problems with subsequent priorities.

Table 5 - Prioritization of sub-criteria for non-realization of BIM in construction projects

Priority	Normalized weight	Sub-criteria
1	0.22776	Dispersion of information and lack of integrated system
2	0.16344	Complex application space
3	0.157806	High design cost with BIM software
4	0.135293	Need different office staff for the project
5	0.089471	Increasing project risk in the implementation phase and decreasing decision accuracy
6	0.058387	Reduce reporting speed, check status and project delays
7	0.053653	The cost of training key and relevant people within the workshop
8	0.048551	Increasing tensions between employer and contractor

9	0.041014	Need for project management and control personnel
10	0.024625	Introduction of new technologies in the field of construction

5- Discussion and conclusion

Considering the factors that were considered by experts and specialists about the factors of BIM failure in this research, by removing the obstacles in front of the building information modeling system (BIM), managers may be willing to use it for optimal resource management and Time and ... will be. In this study, barriers such as financial barriers, human resources, time and technical issues were evaluated and selected from specialists and experts and the factors were prioritized. According to the results of the study, the following effective criteria in the non-realization of BIM and determining the degree of importance of each of them, the biggest obstacle to BIM is the dispersion of information and the lack of an integrated system that has the greatest impact on non-realization of BIM. In the next categories, respectively, the complex program space and the high cost of design with BIM software are factors that have a significant impact on the non-realization of BIM. In the next priorities, respectively, the need for different office staff for the project and increasing the project risk in the implementation phase and decreasing the accuracy of decision-making were among the factors that had a high impact on the non-realization of BIM. Also, reducing the speed of reporting, the cost of training key and related people within the workshop, increasing tensions between the employer and the contractor, the need for management and project control forces, the introduction of new technologies in the field of project construction are in the next ranks, respectively. Is. Therefore, in order to upgrade the building information modeling system, you should think of a solution to reduce the obstacles. Considering the factors that have hindered the realization of BIM in construction projects and determining the most important factors from the perspective of experts in the field, it can be said that modeling building information in construction projects needs the support of senior managers to implement it. The matter itself depends on the reasons mentioned. Because by removing the obstacles in front of it, in order to optimally manage resources and time, etc., managers may be willing to use it.

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