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Research Article

INVESTIGATING EFFECTS OF PROJECT MANAGEMENT INFORMATION SYSTEMS ON SUCCESS OF MANUFACTURING AND PRODUCTION PROJECTS: CASE STUDY OF MAPNA BOILER CO., MACHINESAZI ARAK CO. AND AZARAB CO.

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ABSTRACT
Today the use of project management information system (PMIS) is one of the major and influential factors in the timely and successful implementation of manufacturing projects so that by making proper flow of information to the managers such as project managers and executive managers help to the proper and timely implementation of projects. In the most of success models of information systems (IS), factors are being considered that influence on the use and user satisfaction. While manufacturing projects due to their complex and procedural nature, which at the same time are composed of several different activities, requires other important factors. Factors such as reporting, identifying the critical activities and their effect on the quality of information and quality of project management are considered to evaluate the effectiveness of information flow in the project. Accordingly, the aim of this paper is to present a model to study the effects of Project Management Information System on the success of manufacturing project. Therefore, after reviewing various models of PMIS and identifying the major and effective factors on efficient project management, the conceptual model presented and then relationships by using the structural equation modeling method and Lisrel investigated. Results of research on three large project-oriented company in Iran showed that information systems project management with consideration of factors such as "reporting costs", "updating", "identifying critical activities and limitation of resources", "providing comprehensible and graphical inputs", "quality of information", " project management quality" and finally "the success of manufacturing projects" is effective.

Keywords*: Project Management Information Systems, Success of Manufacturing Project, Project Management, Information Quality*

INTRODUCTION
In recent years, successful implementation of projects in project-based organizations, without regard to the flow and proper analysis of information is not possible. Having accurate and timely information on the event about the project including cost, risk, procurement, quality, etc. can help experts, project managers and executive managers to promote better implementation of project of manufacturing. Accordingly, having a powerful database system in addition to project management is a prerequisite for successful implementation of projects. Projects due to their nature of being diverse and new have a structure different from the current routine affairs in organizations. Accordingly, project management has been always more difficult than general administration of organization and requires more attention to the changing dimension of the project (Project Management Institute). Management to perform its main function, i.e. decision making in such a structure, requires accurate, rapid and efficient information to take his decisions based on reliable information. Project Management Information System (PMIS) is an information system that uses its own tools and techniques to gather, integrate, and disseminate the outputs of project management processes. This system supports all aspects of the project from the scratch to end and it has gotten both manual and automated systems. By definition, the first task of project management information system is collecting, processing and refining the raw data and providing the baseline and analyzed information required by management at all levels. By using this information with passage of time and after a few projects, the organizational knowledge creates. In addition to these tasks, facilitating tasks of project is the other duty of these systems. Most of projects with medium to large complexity to

plan and manage use data management system (Avazzadeh, 2008). Traditionally, project managers used it to advance sophisticated plans such as planning, resource management and project costing, but today their target has been widened and more complex systems are able not only to manage their own projects but also to manage completely and properly the project itself (Daire *et al.*, 2008).

Research's Background

More than 50 years have passed since the emergence of codified systems of planning and project management and the work of development, creation of different standards as well as making appropriate software in this field continues more rapidly. Fortunately, understanding of individuals and project-based organizations of the concept of project management in developing countries by entering into the 21st century has changed. Although, in the past having a project management system used to be considered a fantastic concept, but at present, existence of a scientific, efficient and effective project management system seems to be necessary for survival. In addition, if a comprehensive project management system established in an organization then organizations' long-term interests will be guarantees (Khanzadeh and Kanani, 2010). During the past years, many models and theories proposed for the success of project management information systems that one of the most successful models among them was the successful information systems by MacLaine and Delon.

Success Model of Information System Management

Success model of information system by MacLaine and Delon proposed in 1970s and 1980s. The model is mainly created by using the communication theory of Shannon and Weaver as well as findings of communication systems of Mason. The model was based on the principle that there is a specific and measurable process model that explains the way of acceptance and use of the information system by user (Raymond and Bergeron, 2008). The model was consisted of two main factors: system quality and information quality. Users and managers by using the system practically gave their satisfaction or dissatisfaction as feedback. Based on the model, the use of this system affects the way of user to do their job and effects of this individual may ultimately lead to organizational effectiveness. After the publication of research by MacLaine and Delon, other people criticized his model and gave suggestions to improve the original model. MacLaine and Delon to meet these criticisms, in another study presented a generalized model. The most important result of new model for success of information system was addition of service quality as one of the major factors indicating further importance of supporting user in the new model. Therefore, MacLaine and Delon by combining organizational and personal interests defined a new structure with name of the net benefits to measure the success in the complex and various information systems. Moreover, they considered the tendency to use the model as another factors in model. Generally, model of information system success requires a particular domain of adoption, which means definition of success dimension and structures directly related to the configuration of information system. However, MacLaine and Delon tried to provide a comprehensive model that in most organizations with different structures to be measurable and executable. Therefore, the results could be comparable and examined in terms of feasibility. MacLaine and Delon Modified model and other models from similar researches are shown in figures 1 to 3 (Daire *et al.*, 2008; Khanzadeh and Kanani, 2010; Raymond and Bergeron, 2008; Farhang, 2005).

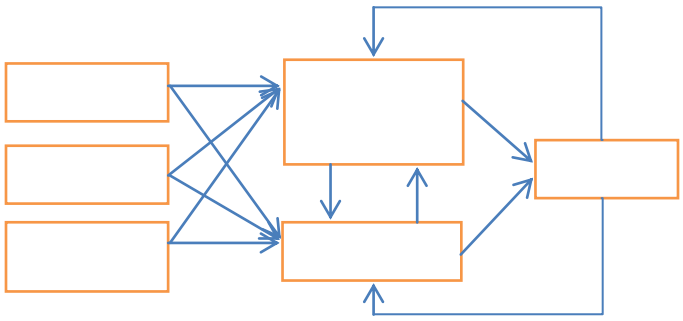

Figure 1: Success model of MacLaine and Delon (Raymond and Bergeron, 2008; Farhang, 2005)

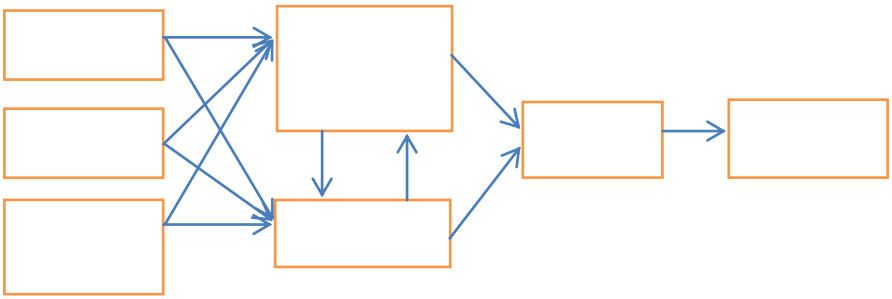

Figure 2: Success model of Pit, Watson and Kevan (Farhang, 2005)

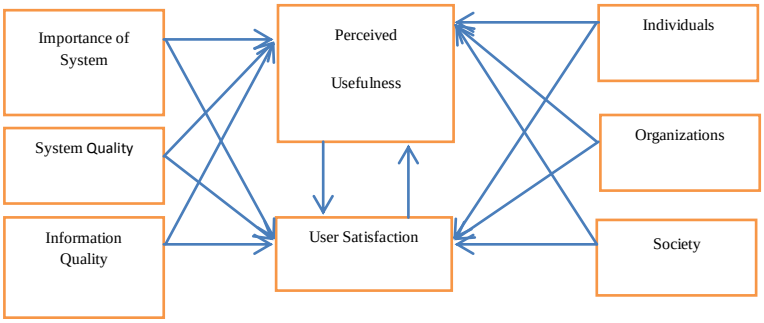

Figure 3: Success model of Seddon and Kiew (Farhang, 2005)

Project Management and Information System

Creating a planning system is with the aim of achieving to the objectives of the project, which realizes through optimizing the duration of the project, the cost of implementation and the quality of the results. Projects are among the most important human activities in order to bring about economic transformation, earning money and making national and international reputation. The project consists of a set of activities with dependent relationships and specific time designed to achieve a specific objective (Jadidi and Esbati, 2008). Project management is the application of knowledge, skills, tools and techniques in project activities to meet the fundamental requirements and demands of the project (Jabalameli *et al.*, 2008). Project management processes are generally composed of three parts: planning, implementation, monitoring and evaluation. Accordingly, the purpose of the planning and control system is gathering, processing and analyzing data from various stages of project and creating reports for decision-making by project manager (Jalali and Roghani, 2005). Nowadays, information in organizations is a valuable asset and implementation of an intelligent system is the goal that organizations follow to make appropriate use of this valuable asset. Information management department in any organizational collect all information and with respect to the need of every manager put them to themselves. At this point of time, due to the existence of competitive environment and the need of project managers to access to intra-organization information, their analysis and reporting different reports on the project, the importance of design of project managers information systems (PMIS) reveals further (Pit, 2005).

Given the effectiveness of information flow in effective project management, existence of an integrated project management system to identify factors affecting the planning and control of projects is essential. Design of an integrated system follows three main aims: to increase reliability, to focus to achieve goals and objectives, creating a tool for control. According to the definitions of management of integrity of project, which is the first standard of PMI (Project Management Institute), we have: the set of integrated systems with the task of recording, classifying and summarizing data and provision of managerial reports provides based on specific requirements of the project. Numerous and complex relationships between components of the executive organization of project and the need for regulation of this communications through establishing procedures and integrated information systems is possible. Reasons for using a continuous system summarizes as follows: 1) Data integration; 2) Standardization of processe; 3)

Standardization of information; 4) Elimination of time and place constraints of access to information as much as possible; 5) Eliminating of unnecessary and repetitive operations; 6) Income-expenditure analysis; 7) Providing the power of managerial decision; 8) Storage of project information as the basic information needed for decision-making.

By recognition of organizational processes through gathering of recording of project's information such as internal and external factors of the organization, risks, opportunities etc., we can provide an overall attitude to the trend of work and performance of that organization and simulate execution of that organization's projects based on the operating records of the organizations. For example, the recognition of life cycle of a project and factors influencing in the trend of project and identification of the time required to perform each activity causes numerous problems for the implementation of project in the future to decrease and by detection of delays prevents them as far as possible. Over time, in addition to access to better outcomes, planning conducted for the project becomes closer to reality and its realization requires an integrated system for record and measurement of that factors. This integrated system by identification of influencing factors in decision-making, which will be effective in future implementation of projects, provides the requirements for implementation of project management. Therefore, a thorough understanding of the project's stages requires an information system for acquisition, storage and information processing (Khanzadeh and Kanani, 2010).

Existence of various elements of three and in large projects with four factors with the management of and different methods of carrying out assignments until the completion of these projects requires each element from the contractor to the employer be aware of the duties, obligations, conditions and regulations governing the contracts to act within the framework of them. Mainly, since the project elements are not aware enough about the conditions, commitments and regulations governing the contract or do not act in accordance with them, difficulties during the project implementation, and generally at the end of them do occurs, which agreed on a definitive solution to solve would be complex and sometimes even impossible. In these situations, the project contractor usually does not receive part of the cost his functioning or contractor pay more than cost of the resulting outcome in the quality or quantity and sometimes the project do not implement completely (Sabzeparvar, 2010).

Management information systems certainly can have important contribution to the contractors and project-focused enterprises for the complete understanding of the various stages of the project to help them in this field, known as "claims management" in the manufacturing projects. Nowadays, the application of project management information systems, including manual or computerized ones in the projects, is vital. Currently, however, all managers, especially, project managers use information systems for affairs such as salary payments, orders, accounting and inventory control. The main difference of PMIS with such systems is that PMIS is only associated with the tasks of project management. Since most MISs designs for repetitive and current tasks, they cannot meet all the needs of project management. In addition, project managers need to have a system that help them in decision making as well as to use of it as a means of aligning the timing, budgeting and control (Seifi, 2008).

Hypotheses and Conceptual Model

According to the above context, the conceptual model includes several factors. In the following, we have introduced these factors and the model assumptions.

1) Cost Reporting

The word "cost" literally means expenditures and in terms of the economy means the total payment that a productive unit pays for capital, land, labor and management (Kaise and Ahlemann, 2010). One of the most important issues in project cost management is the definition and the concept of cost. According to the definition, the cost is the paid or promised payment leading to the completion of the project. Report is associated to the physical and programming progress of the project at every level of activity and the comparison between physical and monetary development of projects carries out at every level. In addition, sums of the total project costs as well as all the absorbed credits will be determined (Seifi, 2008). Regarding the importance of reporting the costs in the quality of the information provided and the management of costs, the first and the second hypotheses defines as follows:

Hypothesis 1: Reporting the costs of project has significant positive effect on the project information quality.
Hypothesis 2: Reporting the costs of project has significant positive effect on the project management quality.

2) *Updating*

All organizations operating in the project, offering a variety forms and formats of reports is common. Proposing these reports is critical in the analysis of system performance, because institutional attitudes develops regarding the carrying out the projects in the future and thus project improvement can be identified and defined.

For example, the reports related to the consultants and contractors contracts, e.g. contract amount, actual progression and progression of program, influence on the performance of contractors and consultants and they can be evaluated (Khanzadeh and Kanani, 2010). Updating reports and information relevant to the project can provide the readiness that at any given time to provide management with a total view with detailed outlines about the project (Seifi, 2008). Accordingly, other hypotheses define as follows:

Hypothesis 3: Updating project's activities reports has significant positive effect on the project information quality.
Hypothesis 4: Updating project's activities reports has significant positive effect on the project management quality.

3) Identification of Critical Activities and Resource Limitations

Identification of critical activities and resource limitations carries out through a variety of reports, which include the following cases:

- Reports indicating projects delays in different years and most important reason for delays, which would be helpful in further understanding the issues related to the project.
- Reports relating to the causes of delay and related times. These reports in most companies and project-based organizations in which achievement to delay reasons and related times are not easy and is often difficult, could be useful.

Recording these delays in a computerized information system that is able with spending less time and labor to extract information and provide the relevant reports in less time can be very important and useful. For example, the effect of bad weather conditions in a year. The delay of a few percent of the total project delays and that this factor is included each year. For example, the effect of adverse climate conditions in every year on the delay amount of project and the fact that this factor includes a few percent of delays in each year can help to identify the system performance and identifying the internal and external factors of organization, which led to delay in the project. By recognizing risks that affect the project, we can provide more precise scheduling for the beginning and conduction of the project (Khanzadeh and Kanani, 2010).

Hypothesis 5: Identification of critical activities and resource limitations has a significant positive effect on the project information quality.
Hypothesis 6: Identification of critical activities and resource limitations has a significant positive effect on the project management quality.

4) Providing Comprehensible and Graphical Data

Providing physical reports and simple and understandable data in different layers, especially managerial reports to executives, senior managers and other levels for policy-making, is an effective factor (Khanzadeh and Kanani, 2010). Thus, providing comprehensible and graphical data can be an important factor in the effectiveness of project management information system.

Hypothesis 7: Graphical and understandable data has significant positive effect on the project information quality.
Hypothesis 8: Graphical and understandable data has significant positive effect on the project management quality.

5) Information Quality

Information is of high quality if provide the needs of user and to be useful and understandable for them (Moghadam and Erfanian, 2011). The aim of information systems is to provide useful decision-making

information for individuals and groups through storing, processing, remanufacturing and management of information resources. The value of these systems reveals when prepared information to be used in operations (Kilee and Ho, 2012). Swanson claimed that the quality of information is a key factor that determines the success of information systems. The quality of information depends upon the quality of outputs of product's information system, which can be as reports or online observation. There are various parameters to assess the quality of data. For example, Ballou and Pazer in their study considered four parameters for the quality of information: accuracy, completeness, sustainability, and appropriateness and being timely. Nelson *et al.*, used parameters such as manufacturing accuracy, completeness, prevalence and format for information quality.

Accuracy uses often as accuracy in the creation of the map of stored information for an appropriate state in the real world, which information is relevant to it. Completeness means that all values for a specific variable are recorded. This concept investigates that whether all the values for the variables are recorded or not. Prevalence refers to the up-to-date being information or the degree of information appropriateness for the current state. Appropriateness and being timely explains that recorded values are usable for the current time and date of their usage has not expired. In fact, updated data should be available for effective decision-making. A strategic planner may use the information of several years ago, but a production manager needs to the recent data. Template refers to the degree to which the information in an understandable and explainable are proposed for use, which helps to the termination of the work. Data connection depends to the functionality of data on a specific issue with a specific user. Data connection could be directly used to solve a business problem (Farhang, 2005).

6) Quality of Project Management

Since 1981 with the efforts of Project Management Institute (PMI), project management became as an independent profession. This institute provided a program known as PMP, which included the volunteers with enough education and expertise and who by participating in Project Management Body of Knowledge (PMBOK) classes obtained the required experience. PMBOK is composed of the following nine topics:

1) Scope: Monitoring project through goals and outcomes desired by the employer,
2) Cost management: Monitoring on project costs through gathering, organizing and analyzing data and finally presenting the financial reports,
3) Time management: planning, scheduling and monitoring the project to achieve time objectives,
4) Human resource management: strategy and coordination of people participating in the project,
5) Relationship Management: Continually dissemination of information and data among project team members and project managers,
6) Quality Management: Achieving quality standards to improve the efficiency of project,
7) Contract/procurement management: selection, negotiation and preparation and purchase of materials, tools and services,
8) Risk management: Facing with uncertainty degree which is available in projects through experience and knowledge in a particular condition,
9) Project Integration Management: Correct homogenizing of all components and functions of a project (Avazzadeh, 2008; Daire *et al.*, 2008; Khanzadeh and Kanani, 2010; Raymond and Bergeron, 2008; Farhang, 2005; Jadidi and Esbati, 2008; Jabalameli *et al.*, 2008; Jalali and Roghani, 2005; Pit, 2005; Sabzeparvar, 2010; Seifi, 2008; Kaise and Ahlemann, 2010; Moghadam and Erfanian, 2011; Kilee and Ho, 2012; ISO, 2009).

In addition to the above cases and according to ISO standard, one of the most basic elements of quality in every process is customer satisfaction. User satisfaction as a customer of information system has effective effect on the proper preformation of activities and plays key role in increasing the quality of the projects (Delone and Mclean, 2003).

On this basis, in this study user satisfaction is another dimension of management quality, which according to Maclean and Delon Research is effective on the success of project. Consent of the user in terms of a customer of system is the result of his emotional attitudes towards the use of management information

system and his evaluation according to the real use that in this evaluation factors such as the effectiveness and efficiency will play a role (Daire *et al*., 2008).

7) The Success of Manufacturing Projects

The success of projects is the result of a comprehensive project management that implements two factors of effectiveness and efficiency over the life of the project. Thus, a successful PMIS must emphasize on the efficient management and effectiveness of the project. Efficiency means working without wasting or spending the minimum time, effort and costs, while effectiveness means doing the right tasks. Project management can be very efficient in doing their tasks, but due to lacking effectiveness may not achieve to their desired goals. In fact, effectiveness means achieving the desired results, which plays an important role in achieving the objectives (Farhang, 2005).

a) Effective Manufacturing Management

Emphasis of effective management in manufacturing projects is on the implementation of doing of project tasks as success factors for the project. Cost, time and quality are key factors for the success of the project. Additionally, due to the importance of two obligatory factors of safety and environmental that has recently received attention in the manufacturing; they were also added to the key success factors. Indeed, effectiveness of the success of the project management is an arena having PMIS as its feeding, which stems from effective management of projects (Farhang, 2005).

b) Efficient Manufacturing Management

If effective manufacturing management is relevant to the success factor of the projects, efficient manufacturing management is relevant to the factors affecting the success of the project. In fact, the efficient manufacturing management refers to the tasks, e.g. improving communication between staff and executers, speed and accuracy, of project managers. Factors influencing the success of the project consist of two categories:

1) Uncontrollable factors such as type of project, type of contract which are pre-determined,

2) Controllable factors including project management competencies, support system, speed and so on (Farhang, 2005).

According to the above context, data quality not only influences on the project's success, but also on the quality of project management. Therefore, the next assumptions are as follows:

Hypothesis 9: The information quality has significant positive effect on the success of the manufacturing project.

Hypothesis 10: The project management quality has significant positive effect on the success of the manufacturing project.

Hypothesis 11: The information quality has significant positive effect on the project management quality.

Based on the assumptions presented, the conceptual model is as in Figure 4.

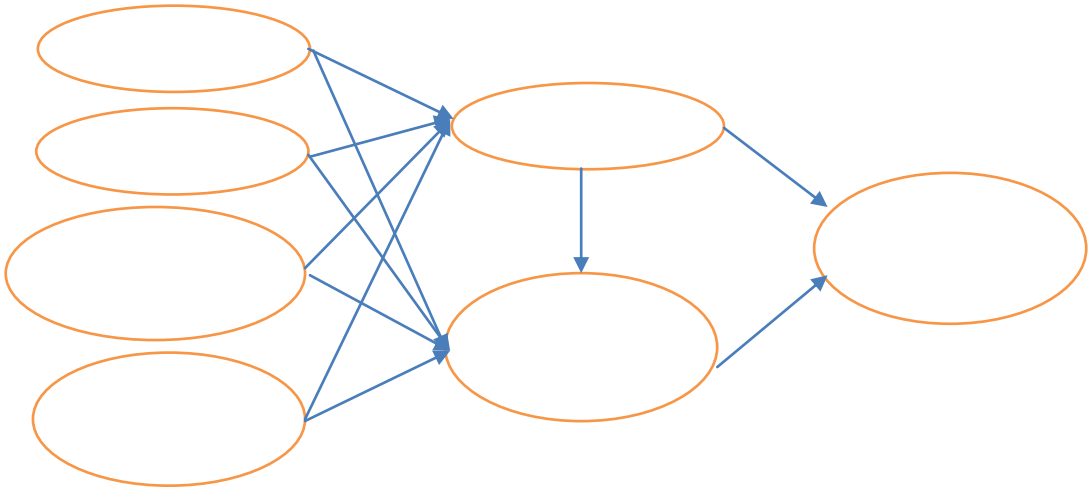

Figure 4: Conceptual model of the research

Research Article

This study aims to evaluate the effect of project management information system in the success of manufacturing project based on the conceptual model of the research and thus it places in the category of causality of cause-effect researches. To collect data, we used the field method and a questionnaire consisting of 39 questions. Questions related to information quality and the success of the project extracted from the questionnaire designed by Kay and HuYu and other questions regarding the mentioned topics extracted from the valid resources (Farhang, 2005). To rate items, ordinal scale and a five-item range of Likert from "strongly disagree" to "strongly agree" was used. To increase the validity of questionnaire, comments of 10 experts of the field, including professors and experts of management, used and structural problems of the first questionnaire resolved to provide the content validity. Questionnaire distributed among experts, project managers and executive administrators of 42 projects in three manufacturing contractors: Mapna Co., Machinesazi Arak Co. and Azarab Co. Demographic data and duration of projects' implementation are shown in Table 1 and Table 2 respectively. To determine the sample size, first 30 questionnaires distributed that given the sample variance, the confidence level of 95% and allowable error of 0.05, sample size according to Formula 1 determined equal to 130.

$$n = \frac{Z^2 . SD^2}{d^2} \quad (1)$$

Table 1: Demographic Data

Gender	
Female	25%
Male	75%
Education level	
BSc.	69%
MSc.	31%
Position	
Expert of project	55%
Head of Project	18%
Project manager	15%
Executive manager	12%

Table 2: Duration of the project

Life Cycle of project	
Less than 2 years	49%
2-5 years	43%
6-10 years	8%

To investigate reliability of the questionnaire, Cronbach's alpha was used. Its value for reporting is 0.931, for updating is 0.992, for identification of critical activities and resource limitations is 0.892, for the graphical and understandable data is 0.889, for data quality is 0.943, for the quality of project management is 0.966 and for the success of manufacturing projects is 0.903. These results reveal that the reliability for each construct exceeds the general recommended criteria of 0.7 and meets the requirement of reliability. Overall Cronbach's alpha coefficient for all questions was determined 0.988. For data analysis and examining the effect of independent variables on the dependent variables, the structural equation modeling and LISREL software has been used.

RESULTS AND DISCUSSION

Results

To test model's hypotheses, we used standard structural equation modeling (SEM), which is a multivariate regression model. In this method, model's hypotheses the relationship between observed

variables, i.e. proposed questions, and latent variables, i.e. considered factors, examined. In fact, this method assuming a linear relationship between observed and latent variables, examines their causal relationships. Thus, the model consists of two parts: the measurement model and the structural model, which both of them tested by LISREL software. The measurement model suggests that how latent variables measures by the observed variables and structural model specifies the causal relationship between latent variables. Loading factors and t-vale of questions are shown in Table 3, which all of them have a significant distance from zero and indicate the good proportion of the measured model. Before testing the hypotheses, the overall fitness of the model should be evaluated. The model fitness indices are given in Table 4. The resalts exhibited a good fit of the measurement model with the data collected (Jung *et al.*, 2011).

Table 3: Summary of results for measurement model

Questions	**α**	**Loading factor (t-value)**	**Questions**	**α**	**Loading factor (t-value)**
Costs reporting	**0.931**		**Information quality**	**0.943**	
1		(12.66) 0.86	19		(-)0.81
2		(12.86) 0.87	20		(13.03) 0.84
3		(12.57) 0.86	21		(13.07) 0.8
4		(12.59) 0.86	22		(13.10) 0.84
5		(13.01) 0.88	23		(13.57) 0.86
Updating	0.992		24		(13.12) 0.83
6		(12.28) 0.84	25		(13.16) 0.85
7		(12.19) 0.82	Project Management Quality	0.966	
8		(12.13) 0.83	26		(-)0.87
9		(12.25) 0.81	27		(14.53) 0.86
10		(12.36) 0.85	28		(15. 4) 0.89
Identification of critical activities	0.892		29		(14.67) 0.86
11		(12.3) 0.86	30		(14.47) 0.86
12		(11.93) 0.79	31		(14.36) 0.83
13		(12.36) 0.8	32		(11.55) 0.8
14		(12.74) 0.88	33		(12.85) 0.85
Graphical data	0.889		34		(12.24) 0.83
15		(12.67) 0.87	Success of manufacturing project	0.903	
16		(12.71) 0.85	35		(-)0.82
17		(13.01) 0.89	36		(14.42) 0.87
18		(13.02) 0.89	37		(12.93) 0.85
			38		(12.14) 0.83
			39		(12.32) 0.84

Structural equation model determines causal relationships of latent variables and causal effects. The results of these calculations and research hypotheses testing are summarized in Table 5.

Table 4: Proportionality indices of measurement model

Index	Valve
$\chi 2$	1609.56
df	690
GFI	0.92
CFI	0.95
NFI	0.93
RMR	0.07
RMSEA	0.08

Table 5: Structural model paths

Paths hypotheses	Correlation	t-value	Test result
Hypothesis 1: Reporting the costs → project information quality	0.85	1.45	Not Supported
Hypothesis 2: Reporting the costs → project management quality	0.9*	5.18	Supported
Hypothesis 3: Updating → project information quality	0.98*	6.22	Supported
Hypothesis 4: Updating → project management quality	0.86	0.72	Not Supported
Hypothesis 5: Identification of critical activities → project information quality	0.84	1.23	Not Supported
Hypothesis 6: Identification of critical activities → project management quality	0.94*	12.21	Supported
Hypothesis 7: Graphical and understandable data → project information quality	0.99*	11.88	Supported
Hypothesis 8: Graphical and understandable data → project management quality	0.71	0.56	Not Supported
Hypothesis 9: Information quality → success of project	0.97*	9.85	Supported
Hypothesis 10: project management quality → success of project	0.99*	10.56	Supported
Hypothesis 11: Information quality → project management quality	0.82*	8.75	Supported

*$P < 0.001$

As shown in Table 5, updating and graphical data had a significant positive effect only on the quality of data and hypotheses 4 and 8 were rejected.

Reporting and identification of critical activities and resources limitations had a positive and significant effect only on the quality of project management.

Thus, hypotheses 1 and 5 were not supported. Furthermore, as expected, the quality of information had affected on the quality of project management and both of these factors had significant positive effects on project success. Thus, hypotheses 10 and 11 were supported. Accordingly, approved research model is presented in Figure 5.

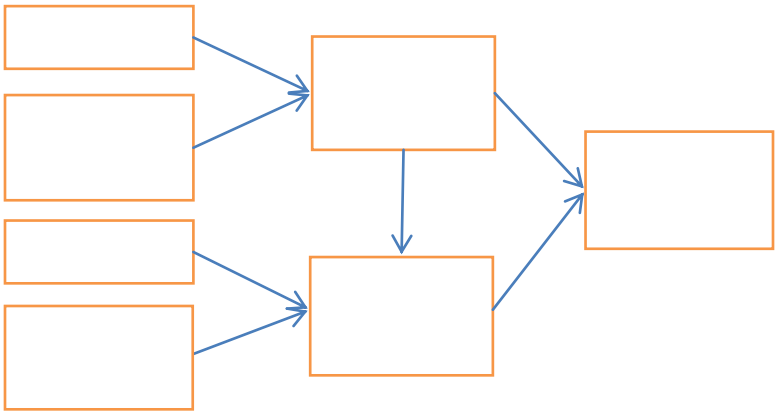

Figure 5: Approved research model

Importance of information systems (IT) in all industries has grown increasingly in the last decades. Information system of project management as one of the application keys of IT plays important role in the process of manufacturing management. It is because that PMIS is a system for collecting information, uniting them and sending the output of management processes to the people participating in the project, which is used to cover all aspects of a project from the beginning to the end. To increase the efficiency of PMIS, identification of key factors that contribute to the successful implementation of project in organization is necessary. The study states that the costs of reporting, comprehensible and graphical data, updating and identification of critical factors are important and effective factors in the information system of the project management. Accurate and timely identification of critical tasks, identification of resource limitations and having accurate and timely reports have always been very important for the project managers and has helped them to take the correct decisions on the project. Providers or developers of information system software should take into consideration the key factors in the design of a management information system for project-based companies that to enhance increasingly their efficiency in these organizations and provide satisfaction of the project managers and experts. A successful and efficient information system can facilitate the simultaneous management of multiple projects and by establishing the correct flow of information to assist the implementation of knowledge management in the organization.

Given the limitations of this study and importance of the success model of PMIS, there are many subjects for future studies in this field. For example, we have referred to the following ones:

1- In addition to the four factors considered in this study, i.e. reporting, identification of critical tasks and resources limitations, providing simple, graphical and understandable data, and updating, there may be other factors that we can add to the model and along with other factors to evaluate and test the hypotheses.

2- Because of the limited budget and time, the present study in two provinces of Tehran and Markazi was done and since the aim of study is generalization of PMIS to the level of national projects, it is better that similar studies be done in all public and private companies across the country.

3- Proposed model studied in manufacturing projects of the oil, gas and power generation equipment, but we can also do it in other sectors of industry as well as in construction projects.

4- It suggests investigating the effect of information systems of project management on the satisfaction of the project's owners.

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