

Designing a creative long-term pattern value in rail transportation projects (Case study: Rail transportation department of Mapna Group)

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Abstract

The origin of any project is identify in its requirement and this means value creation of a project, which should be measured according to how these needs, are satisfied. At the same time, it is important, as how efficient is a project and at what price can these needs be met? In its simplest form, value is defined as the relationship between expanses and benefit, or a measure of what one loses compared to what one gains. In this article, the data needed to answer the research questions collected using the questionnaire's tool, to analyze the collected data Descriptive statistics and inferential statistics methods utilized. In the descriptive analysis of this research from frequency table, and central and dispersion indices used in the inferential analysis part of the research, Friedman's ranking test also used. To answer the research questions firstly, we reviewed the articles and reports, also consultation with five experts from the rail transportation department thus, the main issues related to the creation of value and risk in the rail transport sector have been identified then, based on these issues, the questionnaire form compiled and distributed among 175 related employees of MAPNA's rail transport companies. The employee's replies to the questions asked through the questionnaire form have been coded and analyzed in SPSS software format. The findings of the research show that there are different solutions to manage and control the identified risks; these specified solutions and strategies presented in the final part of this study.

Keywords: Value creation, rail transportation projects, Mapna Group

1- Introduction

The capitalist economy, which before this, was only in pursuit of increasing consumption in any possible way; Today, there is a new look at the importance of creating productivity through the value chain as a macro solution. On the other hand, at the micro level, value creation in the business literature as the main goal of organizations have long been emphasized and has been welcomed by the thinkers for a long time. Many scholars have stated already that a company should create value for its shareholders while some insist that the value should be created not only for their shareholders but also for all beneficiaries involved thus, value means the capacity of a good, service or activity to satisfy a need or provide benefit towards a real

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personality or legal characteristic. Moreover, based on studies performed, value, in its simplest form is defined as the relationship between the cost and benefit, or a measurement of what one gives up for what one gains. In time, a company creates value for its shareholders when the shareholder equity returns are greater than the cost of capital (expected return on equity). In other words, when a company creates value during a year that improves expectations gradually (Fernandez, 2001) so, in this study, the concept of value creation in the form of the companies' goals or manufacturer is considered or intended therefore, from this point of view, it's necessary to consider a multi-dimensional concept of value creation in three dimensions form such as; financial, non-financial and time with the following characteristics

- Creating financial value such as profit, income, shares, ETC.
- Creation of non-financial value such as, reliable source of income and trustworthy as well as good reputation, ownership pride, ETC.
- Creating time value such as, stability and long-term financial security, investment in new products and technology, quality and human resources as well as long-term strategic partnership with various suppliers, ETC.

Since in this study, a long-term value creation in rail transportation's projects will be reviewed therefore, it is believed that the source of any project is to identify the required needs in line with it so; it means the value creation or creating the value of a particular project furthermore, the value creation of a project should be measured in terms of how to satisfy these mentioned needs also, at the same time finding importance of, how efficient is the project and at what price these needs could be met

2- Literature review and research background

Previous efforts to create value have been advertised as "value management". In the literature and theoretical foundations of this issue, there are two approaches that can be identified, the first one is based on the traditional value engineering narrative known as (aka Hard VM) and its primary goal is towards cost reduction. The second type which is the newer, is called soft value management (SVM) and its primary goal is achieving a common understanding of the value criteria related to a particular project. These two above mentioned approaches are criticized in terms of their underlying assumptions. Emerging literature in the field of value creation is also diverse, according to many researchers, value creation is a multi-stage, dynamic and ongoing process in the context of time, in each stage the nature of the created value is appropriate to that stage, and different interest groups are involved in this process, and each of them has roles They perform different (Lajevardi & colleagues, 2018). Jack Welch¹, the former CEO of General Electric, one of the advocates of maximizing the value of the organization, stated in a famous interview in 2009 that "The idea of prioritizing shareholder value is the stupidest idea in the world." Welch himself believes that shareholder value should be achieved as a result of the implementation of a strategy, rather than becoming a strategy itself. Welch's point out that we cannot state that our strategy is going to maximize the value of the organization, Because this statement will not lead to tangible results that will motivate the people of the organization. Rather, he believed that to create value you must implement successful strategies and VBM² can be considered a part of implementing that strategy. It should be noted that since the field of study of this research is specialized parent companies, therefore the category of value creation in these companies are different from independent companies. The first criterion for strategic decisions at the level of the parent company is to rely on the advantages of this company, while the basis of strategic decisions at the level of independent companies is to rely on competitive advantages. The steps of the strategy development process, such as the long-term value creation strategy at the parent company level, can be introduced as follows:

¹ Jack Welch

² Value-Based Management

- 1- Identifying and understanding the characteristics (points) of the mother company**
- 2- Identifying and understanding the characteristics (points) of subsidiaries**
- 3- Evaluating and identifying the strengths and weaknesses, competitive characteristics of the parent company**
- 4- Judging and recognizing the possibilities of any changes related to these factors in the future**

Of course, in the value creation paradigm of companies and projects, where the satisfaction of all stakeholders are considered, in fact, the identification and management of environmental changes are considered as the main point. Therefore, the value of a company could be directly related to the decisions that the company makes; Whatever projects to participate in and how to finance them and what profit sharing policy to adopt for it. As well as knowing, the kind of relationship, is the key to making the appropriate decisions which increase the value of the company towards wise financial restructuring (Damodaran, 2014). Mapna Railway Transportation Department with eight subsidiary companies including; **1) MAPNA Locomotive Engineering and Manufacturing Company (MLC) 2) MAPNA Railway Maintenance and Operation Development Company (MRM) 3) MAPNA Railway Construction and Development Company (MRC) 4) MAPNA Rail Technologies Company (MRT) 5) MAPNA Railway Fleet Development Company (MRFD) 6) MAPNA Wagon Pars 7) Mapna Ihya Sanat Company 8) MAPNA Multimodal Transportation Company (MMT) Company**, were established in order to develop the rail transportation industry in Iran, as well as export engineering equipment and services to neighboring countries and regional markets. With the aim of developing the infrastructure and localization of Iran's rail industry, Mapna Group entered in the field of rail transportation with huge investments hence, over the past 15 years and by completing the rail value chain, it has completed all the links needed to create a sustainable business in Rail transportation and with the idea of creating a permanent motion machine in the field of rail transportation economy, the rail department tried to maximize the profit and minimize the risk of its related business. In this regard, the MAPNA rail transportation department started a new business under the name MAPNA Multimodal Transport Company with the mission of creating demand for the production fleet of MAPNA Locomotive and Pars Wagon companies in the form of fleet purchase contracts, creating demand for services , repairs and maintenance and service of locomotives and private wagons and rental for two companies, repair and development of Mapna railway operation and revitalization of Mapna industry, and in the continuation of creating demand for the creation of new railway lines for Mapna railway construction and development company, in other words, has tried towards this idea, by creating a stable demand for the companies in the sector and will prevent them from stopping their performance during periods of demand reduction and market stagnation, and with this method, reduce the business risk to the minimum as possible. According to these points and the special nature of transportation projects with compression to other projects, the study of the value creation model for rail transportation projects has its own necessity and importance from both the theoretical and practical aspects. For example, transportation projects generally have the following characteristics.

- 1) High infrastructure costs along with long-term operational costs
- 2) Existence of non-technical challenges along with technical challenges
- 3) Multiplicity of planning factors and multiple stakeholders related to transportation projects
- 4) The need for multiple specializations considering the nature of the projects and the need to consider different stakeholders
- 5) The appearance of new problems and the need for new ideas towards solving them
- 6) High limitations in transportation projects (especially time and space limitations)
- 7) The high impact of projects with each other (in this case ,is more severe in the case of transportation projects)
- 8) High sensitivity of citizens and users of transportation systems towards related projects & activities (high social and political sensitivities of projects)

Concerning project governance, in a literature review Ahola et al. (2014) distinguish between project governance as external to a specific project and internal to a specific project. Project governance as external to a project is typically found in project-based organizations with principal-agent relations between the organisation and its projects because the project manager may prioritise the project or herself on the organisation's expense. On the other hand, project governance as internal to a specific project aims for projects that meet the various stakeholders' goals and expectations. In the present research, the perspective on project governance is internal to a specific project. Project governance may increase the likelihood of project success. With respect to the definitions and explanations provided related to value creation as a criterion for the success of projects and the main goal of companies, as well as examining the challenges and characteristics of transportation projects, the necessity of introducing a model for value creation in rail transportation projects is determined. As a result, the research problem that refers to the theoretical and practical gap of the subject could be introduced as follows: What is the pattern of long-term value creation in the projects of Mapna's rail transportation sector?

3- Research method

This particular research is based on practical purpose and the type of research method of this study, which could be exploratory, descriptive, analytical or predictive according to the research of the questions. A descriptive approach is used for better understanding of what the value is, how it is created and what creates value (first research question). To explain and discuss the findings in order to identify and classify the elements or features that create value (the second question) from the explanatory and analytical approach and finally, to suggest ways to increase value creation in projects from the previous approach so, for this the prediction approach is used. The temporal scope of this study is single-section and includes the first half of year 1401, The geographical territory of the research is Mapna railway transportation department with its eight subsidiary companies. Considering the need to answer the research questions in a scientific way, therefore, according to each question, the method of data processing and analysis and specific information of that subject will be used as follows; In order to identify the dimensions and criteria of value creation in Mapna's Rail Transportation Group and after consultation with related experts and reviewing the various reports and articles, was decided that two questionnaires forms are appropriate for collecting data to be used. In the first questionnaire, participants in the research have been requested ,after completing their personal information such as (gender, age, education, work experience) based on the Likert scale would determine the status of Mapna's rail transport sector with respect to terms of each of the mentioned Furthermore, a total of 61 value creation indicators were classified in 8 different groups indicators. In the second questionnaire, participants in the research have been requested to compute the rate of the occurrence probability and to intensity of each risk that occurs in the value creation process of Mapna's rail transportation sector based on the Likert scale. The risks have been categorized in six main groups and include 49 different risks. In table (1), the reliability of dimensions related to value creation and value creation risks have been evaluated by using Cronbach's alpha coefficient thus, Since the value of Cronbach's alpha statistic for all variable dimensions of value creation and related risks are greater than 0.7, both research questionnaires have acceptable reliability.

Table 1. Reliability of measurement tools

The measurement variable	Dimensions	Cronbach's alpha	Number of objects
Creating value	Economic and financial	0,74.	14
	organizational	0,86	10
	Customer demand	0,72	12
	Marketing	0,71	5
	Pricing	0,93	3
	Technology	0,81	6
	Infrastructure	0,73	5
	Environmental and health	0,72	6
Value creation risks	Risks related to the market and competition	0,76	21
	Knowledge and technology	0,86	4
	Legal, Diplomacy and political	0,87	5
	Risks related to the supply chain and employers	0,71	15
	Risks related to safety, health and environment	0,72	4

4- Findings

4-1- Descriptive analysis of participants in the questionnaire

This section is dedicated to the descriptive analysis of the research sample. The research questionnaire was randomly distributed among 215 people from the Statistical community, of which 175 answered all the questions completely; as a result, the completion rate of research questionnaires is about 81%, of the total 175 people who answered the related questions in the stated questionnaire, 162 are men and 14 are women, which make up 92% and 8% of the sample, respectively (table 2).

Table 2. Distribution of the frequency of participants in the questionnaire according to gender

gender	The cumulative frequency	Relative abundance	absolute frequency
Man	0,92	0,92	162
Female	0,100	0,8	14

Of the total 175 people who participated in the research, 21.1% have high school educational degree, 29.1% have diploma educational degree, 25.1% have associate and bachelor educational degree, 16.6% have masters educational and 8% have doctorate educational degrees(table 3).

Table 3. Frequency distribution of participants in the questionnaire according to educational degrees

Education	The cumulative frequency	Relative abundance	Absolute frequency
High school	21,1	21,1	37
diploma	50,3	29,1	51
Associate and Bachelor	75,4	25,1	44
Masters	92,0	16,6	29
PhD	100,0	8,0	14

Nearly 90% of the people who participated in the research have less than 15 years of working experience, and about 10% had more than 15 years of working experience in the rail transport sector(table 4).

Table 4. Distribution of the frequency of participants in the questionnaire according to job experiences

Work experience	The cumulative frequency	Relative abundance	Absolute frequency
Under 5 years	16,6	16,6	29
years 5-10	53,1	36,6	64
years 11-15	89,7	36,6	64
years 16-20	93,1	3,4	6
years 21-25	95,4	2,3	4
Over 25 years	100,0	4,6	8

Of the 175 people who have participated in the research, 5.1% were under 30 years old, 24.6% were 30 to 35 years old, 42.3% were 36 to 40 years old, 18.9% were 41 to 45 years old, 2.3% were 46 to 50 years old, and 6.9% were over 50 years old (table 5).

Table 5. Frequency distribution of participants in the questionnaire according to age

Age	The cumulative frequency	Relative abundance	Absolute frequency
Under 30 years	5,1	5,1	9
years 30-35	29,7	24,6	43
years 36-40	72,0	42,3	74
years 41-45	90,9	18,9	33
years 46-50	93,1	2,3	4
Over 50 years	100,0	6,9	12

4-2- Analysis of the frequency of items and dimensions of value creation and risks related to it

In this section, using frequency table analysis, the distribution of people's responses to value creation components and related risks have been evaluated. In table (6), the relative frequency of the responses from the people present in the research to each of the items of value creation in the MAPNA's rail transportation department has been presented.

Table 6. Analysis of the frequency of items and dimensions of value creation and risks related to it

Dimensions of value creation	Item No.	Criteria	very good	Good	medium	weak	Very weak
Economical & financial	1	Effecting on domestic production and reduction of foreign currency	38,3	38,3	8,6	11,4	3,4
	2	Reducing the cost of travel for passengers	39,4	38,9	8,6	6,9	6,3
	3	Reducing waste and depreciation	47,4	30,9	8,0	12,6	1,1
	4	Efficiency	35,4	40,6	8,6	11,4	4,0
	5	Reduction of production cost	39,4	35,4	9,1	11,4	4,6
	6	Ability to increase production capacity	32	39,4	10,9	13,7	4,0
	7	Accessing to raw materials	42,9	29,1	11,4	12,0	4,6
	8	Existence balance in the available resources	42,3	29,7	11,4	12,0	4,6
	9	Accessing to the energy	42,3	36,6	6,9	8,6	5,7

Dimensions of value creation	Item No.	Criteria	very good	Good	medium	weak	Very weak
	10	Energy consumption	41,7	32,0	8,0	11,4	6,9
	11	Maximum use of production capacity	34,3	36,6	12,0	13,7	3,4
	12	Employment	38,9	37,7	8,6	11,4	3,4
	13	Production flexibility	33,7	37,7	10,9	13,7	4,0
	14	Reduction in travel time	37,7	37,1	9,7	7,4	8,0
Organizational	15	Manpower interactions with each other	16,6	32,6	31,4	14,3	5,1
	16	Accumulation of knowledge and experience	32,6	29,7	24,0	11,4	2,3
	17	Group participation and willingness towards employee's cooperation	12,6	36,0	30,9	14,9	5,7
	18	Investment in social programs	14,3	35,4	31,4	13,7	5,1
	19	Skills and knowledge of employees	14,9	33,7	32,6	13,7	5,1
	20	Employee incentive plan	13,1	36,6	31,4	13,7	5,1
	21	Employee training program	13,1	36,0	30,9	14,9	5,1
	22	Long-term strategies	22,9	30,9	28,6	12,0	5,7
	23	Interaction & partnership with the government	24,0	32,0	28,0	12,6	3,4
	24	Interaction and partnership with suppliers	25,7	33,1	26,3	12,0	2,9
Customer requirement	25	Obtaining customer confidence and	44,6	24,0	17,7	10,3	3,4
	26	Providing quality products and services	40,6	32,0	18,9	8,0	0,6
	27	Providing products or services with innovative features	41,1	24,6	18,9	10,9	4,6
	28	Ensuring the customers easy access towards products and services at any time	34,9	30,3	18,9	11,4	4,6
	29	Customer satisfaction towards a quick and favorable response for their new orders	37,1	28,6	17,7	12,0	4,6
	30	Having continuous and favorable relationships with the customers	42,3	24,6	18,3	10,9	4,0
	31	Provide special offers towards customer's satisfaction	38,3	32,6	16,0	8,0	5,1
	32	Long-term relationships with customers	38,3	25,7	18,3	12,0	5,7
	33	Interaction with customers to provide a better service to them	40,6	25,7	21,1	8,0	4,6
	34	Quick response towards customer complaint	44,6	24,0	17,7	10,3	3,4
	35	presenting the best quality towards after-sales service	40,6	32,0	18,9	8,0	0,6
	36	Increase the level of services	41,1	24,6	18,9	10,9	4,6
Marketing	37	Distribution strategy	17,7	31,4	30,3	16,6	4,0

Dimensions of value creation	Item No.	Criteria	very good	Good	medium	weak	Very weak
	38	Marketing strategy	43,4	39,4	14,3	2,9	0,0
	39	Number of distribution channels	15,4	30,9	32,0	17,7	4,0
	40	Maintain and improve market share	47,4	34,3	16,0	2,3	0,0
	41	Covering a wide range of products and services	42,3	37,1	17,7	2,9	0,0
Pricing	42	Fair pricing policies for entire customers	29,1	37,1	25,1	7,4	1,1
	43	Consistent and accurate pricing policies	25,1	38,3	28,0	7,4	1,1
	44	Providing quality products and services at reasonable prices	38,9	29,7	23,4	6,9	1,1
Technology	45	Investment in R&D	17,1	52,6	29,1	1,1	0,0
	46	Technological capabilities	22,9	48,0	28,0	1,1	0,0
	47	technology management	20,0	49,1	29,7	1,1	0,0
	48	Use of new and up-to-dated equipment and technologies	29,1	47,4	23,4	0,0	0,0
	49	Cooperation with foreign companies and technology transfer	33,1	43,4	23,4	0,0	0,0
	50	Reverse Engineering	35,4	42,3	22,3	0,0	0,0
Infrastructure	51	Access to new ways	49,7	27,4	16,6	6,3	0,0
	52	Infrastructure features	42,3	29,7	18,9	9,1	0,0
	53	Ability to innovate and recreate	44,6	29,1	13,7	9,7	2,9
	54	Ability to expand related involved business activity	43,4	30,3	15,4	9,1	1,7
	55	geographical location	43,4	32,0	18,3	6,3	0,0
Health & Environmental	56	Reducing the production of carbon monoxide and other polluting gases	50,3	31,4	14,3	3,4	0,6
	57	Reduce noise pollution	42,9	30,9	21,7	4,0	0,6
	58	Reducing environmental degradation	49,1	36,6	12,0	1,7	0,6
	59	Reducing casualties caused by road accidents	52,6	32,0	14,3	1,1	0,0
	60	Waste management system	44,6	34,3	18,9	2,3	0,0
	61	Environmental Assessment	46,9	33,7	16,6	2,9	0,0

In table (7) , the relative frequency of responses of the people present in the research to the probability of occurrence of each of the, value creation risk items in Mapna's rail transportation sector has been presented.

Table 7. The relative frequency of responses regarding the possibility of value creation risks in Mapna's rail transportation sector

Type	Item No.	Risks	probability of occurrence				
			very much	much	medium	little	very little
Risks related to the market and competition	1	Delay in receiving claims	9,1	40,6	38,9	10,9	0,6
	2	The problem of accessing financial resources available abroad	7,4	37,7	41,1	12,6	1,1
	3	Disruption of the government's financial circulation due to the increase or continuation of the level of sanctions	10,9	38,3	38,3	12,6	0,0
	4	Increase in current expenditures and project overhead	13,1	35,4	45,7	5,7	0,0
	5	Reducing the balance in the type of available resources	9,1	34,3	43,4	12,0	1,1
	6	Cash flow problems	12,6	38,9	40,6	8,0	0,0
	7	Changes in credit rules	11,4	37,1	41,7	9,7	0,0
	8	Increase in loan interest rate	9,7	41,7	38,3	9,1	1,1
	9	Increase in exchange rate	9,1	44,0	36,6	9,1	1,1
	10	An increase in the exchange rate and the effect on the status of concluded contracts	10,9	44,0	38,3	5,7	1,1
	11	The dependence of the group's income on the financial and economic conditions of the government	10,3	36,0	42,3	11,4	0,0
	12	The willingness of suppliers to enter into a foreign exchange contract	9,7	41,7	37,1	9,7	1,7
	13	The possibility of part of foreign exchange resources being unavailable and limited for special purpose	9,7	41,1	37,7	9,7	1,7
	14	A dramatic increase in costs due to exchange rate fluctuations	9,1	41,7	37,7	9,7	1,7
	15	Changes in laws & regulations related to employers and contractors	1,7	28,0	48,6	20,6	1,1
	16	Prolongation of the clearance process of goods and raw materials needed due to banking problems, as well as changes in internal laws and liquidity issues	8,0	40,0	40,6	9,7	1,7
	17	Confinement the ability to finance towards the implementation of projects	5,1	34,9	38,3	20,6	1,1
	18	Extensive entry of competitors into the new energy market and capturing the market shares	6,4	28,0	49,1	14,9	0,6
	19	Increase in finish cost of goods and services	10,3	42,9	36,0	9,1	1,7
	20	Competitors' exploitation of regional conditions and Iran's conditions in the appropriate direction	6,9	25,7	49,7	14,9	2,9
	21	Removing or becoming expensive to participate in international tenders	6,3	22,9	49,1	20,6	1,1

Type	Item No.	Risks	probability of occurrence				
			very much	much	medium	little	very little
Knowledge and technology	22	Rapid changes in renewable energy technology	10,3	42,9	36,0	9,1	1,7
	23	Access restriction to international design software	10,9	35,4	37,1	15,4	1,1
	24	The company lagging behind the digital transformation in various industries	10,9	35,4	37,1	15,4	1,1
	25	Increasing the technology gap in the fields of goods and services and limiting the transfer of new technologies	9,7	34,9	40,0	14,3	1,1
Legal, policy and political	26	Possible problems in transferring money abroad	9,1	41,7	37,7	9,7	1,7
	27	Possible problems in project implementation in countries with high political risk	9,1	41,7	37,7	9,7	1,7
	28	Increasing economic and political instability	9,1	41,7	37,7	9,7	1,7
	29	The effect of currency price fluctuations on economic and financial calculations of projects	9,1	41,7	37,7	9,7	1,7
	30	Impossibility of importing equipment and parts needed by the group	9,1	41,7	37,7	9,7	1,7
Risks related to the supply chain and employers	31	Problems of verifying the status of supplies and parts provided from outside the vendor list of employers	5,7	27,4	46,3	17,7	2,9
	32	Restrictions in choosing suppliers due to boycott	6,9	29,1	44,6	18,9	0,6
	33	Loss of existing customers due to economic and political conditions	8,0	30,9	42,3	18,3	0,6
	34	Inability to provide optimal services by domestic contractors	7,4	29,7	43,4	18,9	0,6
	35	Non-acceptance of domestically manufactured equipment by some employers and the possibility of registering a defect due to employers' refusal to replace domestically manufactured equipment with foreign equipment built.	3,4	26,3	49,7	19,4	1,1
	36	The financial power reduction of contractors or internal supply sources	5,1	20,6	51,4	21,1	1,7
	37	The increase in the price of products and the difficulty with contractors due to the increase in the price of raw materials and annual inflation and the increase in inputs	5,1	21,7	50,3	21,1	1,7
	38	The willingness of employers to receive services from abroad and import parts	6,9	25,1	40,6	25,7	1,7
	39	Changing the demands, decisions and preferences of employers	5,7	34,3	41,7	16,6	1,7

Type	Item No.	Risks	probability of occurrence				
			very much	much	medium	little	very little
Risks related to the supply chain and employers	40	Lack of correct cost estimation of expenses and budgeting	5,7	25,1	47,4	20,6	1,1
	41	Delay in delivery, confirmation and payment by the employer	6,3	35,4	43,4	14,3	0,6
	42	Limited cooperation of employers in relation towards statements status verification, as well as Letter of credit documents verification for reimbursement of fund	5,7	22,3	49,7	21,1	1,1
	43	Fluctuation and long-term disruption of the supply chain from other countries due to the corona virus pandemic	5,1	20,6	51,4	21,1	1,7
	44	Reducing motivation of the employers towards advance Promotion of investment projects	2,9	30,3	50,9	14,9	1,1
	45	Delays and procrastination of governmental employers towards project invoices reimbursement	4,0	26,9	47,4	20,0	1,7
Risks related to safety, health and environment	46	Risks caused by human error	4,0	28,0	48,0	18,9	1,1
	47	Accident occurrences in facilities and existed equipment in projects	6,3	28,6	45,7	18,9	0,6
	48	Environmental pollution and destruction of it	10,3	29,1	43,4	16,6	0,6
	49	Spread of poisoning and disease in current projects	5,7	28,6	45,7	18,3	1,7

If in table (7), the relative frequency of "very much" and "a lot" responses are added together and the risk criteria are ranked based on that therefore, risk indicators that are most likely to occur based on the frequency of responses here, are going to be identified. In table (8), the relative frequency of the responses of the people present in the research to the intensity of the effect of each of the value creation risk items in Mapna's rail transportation sector is presented.

Table 8. The relative frequency of responses regarding the intensity of the impact of value creation risks in Mapna's rail transportation sector

Type	Item No.	Risks	Intensify of impact if it occurs				
			very much	much	medium	little	very little
Risks related to the market and competition	1	Delay in receiving claims	15,4	44,0	36,6	4,0	0,0
	2	The problem of accessing financial resources available abroad	10,3	51,4	32,0	6,3	0,0
	3	Disruption of the government's financial circulation due to the increase or continuation of the level of sanctions	23,4	40,6	31,4	4,0	0,6
	4	Increase in current expenditures and project overhead	16,0	46,9	29,7	7,4	0,0
	5	Reducing the balance in the type of available	19,4	42,9	29,7	7,4	0,6
	6	Cash flow problems	16,0	52,0	26,9	5,1	0,0
	7	Changes in credit rules	26,9	45,7	24,6	2,3	0,6
	8	Increase in loan interest rate	26,3	46,9	24,6	2,3	0,0
	9	Increase in exchange rate	29,1	45,1	22,9	2,3	0,6
	10	An increase in the exchange rate and the effect on the status of concluded contracts	16,6	48,0	32,6	2,9	0,0
	11	The dependence of the group's income on the financial and economic conditions of the government	17,1	46,3	29,7	6,9	0,0
	12	The willingness of suppliers to enter into a foreign exchange contract	25,1	41,1	29,1	4,0	0,6
	13	The possibility of part of foreign exchange resources being unavailable and limited for special purpose	26,9	40,0	29,7	2,9	0,6
	14	A dramatic increase in costs due to exchange rate fluctuations	30,9	41,7	24,6	2,3	0,6
	15	Changes in laws & regulations related to employers and contractors	5,1	34,9	50,3	8,6	0,6
	16	Prolongation of the clearance process of goods and raw materials needed due to banking problems, as well as changes in internal laws and liquidity issues	27,4	44,0	25,1	2,9	0,6
	17	Confinement the ability to finance towards the implementation of projects	5,7	38,9	47,4	8,0	0,0
	18	Extensive entry of competitors into the new energy market and capturing the market shares	8,6	37,7	44,6	9,1	0,0
	19	Increase in finish cost of goods and services	26,9	43,4	26,9	2,3	0,6
	20	Competitors' exploitation of regional conditions and Iran's conditions in the appropriate direction	5,1	37,1	47,4	9,1	1,1

Type	Item No.	Risks	Intensify of impact if it occurs				
			very much	much	medium	little	very little
	21	Removing or expensive to participate in international tenders	5,7	35,4	49,7	8,6	0,6
Knowledge and technology	22	Rapid changes in renewable energy technology	5,7	40,0	42,9	11,4	0,0
	23	Access restriction to international design software	6,3	44,0	38,3	11,4	0,0
	24	The company lagging behind the digital transformation in various industries	6,3	38,9	44,0	10,9	0,0
	25	Increasing the technology gap in the fields of goods and services and limiting the transfer of new technologies	16,6	41,7	32,0	9,7	0,0
Legal, policy and political	26	Possible problems in transferring money abroad	12,0	32,6	50,9	4,0	0,6
	27	Possible problems in project implementation in countries with high political risk	11,4	38,9	41,7	7,4	0,6
	28	Increasing economic and political instability	5,7	40,0	49,1	4,6	0,6
	29	The effect of currency price fluctuations on economic and financial calculations of projects	7,4	37,7	49,1	5,7	0,0
	30	Impossibility of importing equipment and parts needed by the group	6,3	49,1	41,1	3,4	0,0
Risks related to the supply chain and employers	31	Problems of verifying the status of supplies and parts provided from outside the vendor list of employers	3,4	45,1	44,6	6,9	0,0
	32	Restrictions in choosing suppliers due to boycott	9,7	30,9	48,0	11,4	0,0
	33	Loss of existing customers due to economic and political conditions	11,4	30,9	46,9	10,9	0,0
	34	Inability to provide optimal services by domestic contractors	12,6	29,7	46,3	11,4	0,0
	35	Non-acceptance of domestically manufactured equipment by some employers and the possibility of registering a defect due to employers' refusal to replace domestically manufactured equipment with foreign equipment built	3,4	36,6	50,3	9,7	0,0
	36	The financial power reduction of contractors or internal supply sources	4,0	36,6	49,7	9,7	0,0
	37	The increase in the price of products and the difficulty with contractors due to the increase in the price of raw materials and annual inflation and the increase in inputs	3,4	36,6	50,3	9,7	0,0
	38	The willingness of employers to receive services from abroad and import parts	6,9	40,0	45,7	7,4	0,0
	39	Changing the demands, decisions and preferences of employers	6,9	37,7	44,0	10,9	0,6

Type	Item No.	Risks	Intensify of impact if it occurs				
			very much	much	medium	little	very little
	40	Lack of correct cost estimation of expenses and budgeting	5,7	38,3	46,9	9,1	0,0
	41	Delay in delivery, confirmation and payment by the employer	6,3	38,3	46,3	8,6	0,6
	42	Limited cooperation of employers in relation towards statements status verification, as well as Letter of	4,6	38,3	48,0	9,1	0,0
	43	Fluctuation and long-term disruption of the supply chain from other countries due to the corona virus	4,0	34,3	51,4	10,3	0,0
	44	Reducing motivation of the employers towards advance Promotion of investment projects Promotion	4,6	35,4	50,9	9,1	0,0
	45	Delays and procrastination of governmental employers towards project invoices reimbursement	8,0	40,0	45,7	6,3	0,0
Risks related to safety, health and environment	46	Risks caused by human error	5,1	41,1	41,7	12,0	0,0
	47	Accident occurrences in facilities and existed equipment in projects	7,4	38,9	42,3	11,4	0,0
	48	Environmental pollution and destruction of it	12,6	38,3	39,4	9,7	0,0
	49	Spread of poisoning and disease in current projects	5,1	36,6	52,0	6,3	0,0

If in table 8, the relative frequency of "very much" and "a lot" responses are added together and the risk criteria are ranked based on that, the risk indicators that have the greatest effect based on the frequency of responses will be identified.

4-3-Descriptive analysis of value creation criteria and risk

All the analyzes presented in section 5 were based on the analysis of the frequency of responses. The problem with this type of analysis is, that it does not take into account other answers and the intensify of their scores. In the descriptive analysis, a more detailed analysis can be achieved by considering a single score for each of the options (score 1 to 5 for the Likert scale) and calculating the central and dispersion indices (table 9).

Table 9. Descriptive indices of the scores assigned to the dimensions of value creation in the rail transport sector of Mapna Group

Dimensions		Criteria	standard deviation	Average
Economical and financial	1	Affecting on domestic production and reducing foreign exchange	1,11	3,97
	2	Reducing the cost of travel for passengers	1,15	3,98
	3	Reducing waste ³ and depreciation	1,07	4,11
	4	Efficiency	1,12	3,92
	5	Reduction of production cost	1,17	3,94
	6	Ability to increase production capacity	1,15	3,82
	7	Accessing to raw materials	1,2	3,94
	8	Existence balance in the available resource	1,2	3,93
	9	Accessing to the energy	1,16	4,01
	10	Energy consumption	1,25	3,9
	11	Maximum usage of production capacity	1,14	3,85
	12	Employment	1,12	3,97
	13	Production flexibility	1,16	3,83
	14	Reduction in travel time	1,22	3,89
The whole dimension			0,55	3,93
Organizational	15	Manpower interactions with each other	1,08	3,41
	16	Accumulation of knowledge and experience	1,09	3,79
	17	Group participation and willingness towards employee's cooperation	1,06	3,75
	18	Investment in social programs	1,06	۳,۴
	19	Skills and knowledge of employees	1,06	3,39
	20	Employee incentive plan	1,04	3,39
	21	Employee training program	1,05	3,37
	22	Long-term strategies	1,14	3,53
	23	Interaction and partnership with the government	1,09	3,61
	24	Interaction and partnership with suppliers	1,07	3,67
The whole dimension			0,71	3,49
Customer requirement	25	Obtaining customer confidence and requirements	1,23	3,84
	26	Providing quality products and services	1,16	3,96
	27	Providing products or services with innovative features	0,98	4,04
	28	Ensuring the customers easy access towards products and services at any time	1,2	3,87

Dimensions		Criteria	standard deviation	Average
	29	Customer satisfaction towards a quick and favorable response for their new orders	1,17	3,79
	30	Having continuous and favorable relationships with the customers	1,19	3,82
	31	Provide special offers towards customer's satisfaction	1,18	3,9
	32	Long-term relationships with customers	1,15	3,91
	33	Interaction with customers to provide a better service to them	1,23	3,19
	34	Quick response towards customer complaint	1,16	3,9
	35	presenting the best quality towards after-sales service	0,96	4,14
	36	Increase the level of services	0,98	4,09
The whole dimension			0,56	3,92
Marketing	37	Distribution strategy	1,08	3,42
	38	Marketing strategy	0,8	4,23
	39	Number of distribution channels	1,07	3,36
	40	Maintain and improve marketing share	0,81	4,27
	41	Covering a wide range of products and services	0,83	4,19
The whole dimension			0,63	3,89
Pricing	42	Fair pricing policies for entire customers	0,96	3,86
	43	Consistent and accurate pricing policies	0,94	3,79
	44	Providing quality products and services at reasonable prices	1	3,98
The whole dimension			0,91	3,88
Technology	45	Investment in R&D	0,7	3,86
	46	Technological capabilities	0,74	3,93
	47	technology management	0,73	3,88
	48	Use of new and up-to-dated equipment and technologies	0,72	4,06
	49	Cooperation with foreign companies and technology transfer	0,75	4,1
	50	Reverse Engineering	0,75	4,13
The whole dimension			0,52	3,99
Infrastructure	51	Access to new ways	0,94	4,21
	52	Infrastructure features	0,99	4,05

Dimensions		Criteria	standard deviation	Average
	53	Ability to innovate and recreate	1,11	4,03
	54	Ability to expand related involved business activity	1,05	4,05
	55	geographical location	0,93	4,13
The whole dimension			0,7	4,09
Health & Environmental	56	Reducing the production of carbon monoxide and other polluting gases	0,87	4,27
	57	Reduce noise pollution	0,92	4,11
	58	Reducing environmental degradation	0,8	4,32
	59	Reducing casualties caused by road accidents	0,77	4,36
	60	Waste management system	0,83	4,21
	61	Environmental Assessment	0,83	4,25
The whole dimension			0,84	4,25

Table (9) shows the average and standard deviation of the scores assigned to each value creation criterion by the respondents. Considering that the items are graded on a Likert scale from 1 to 5, If the average score of each item is less than 3, it can be said that the status of Mapna's rail transportation sector is below average and weak in terms of this index, and if the average score is higher than 3, the status of Mapna's rail transportation sector will be above average in terms of that item. As can be seen in table (9), based on the opinions of the respondents, all the subjects in general scored higher than average, and therefore value creation in the Mapna railway complex was relatively favorable. The index of "reduction of casualties caused by road accidents" with an average score of 4.36 has obtained a higher score than other items, and as a result, according to the participants in the research, it has a greater impact in creating value. In order to prioritize risks in value creation, one must have a single measure of risk. Due to the fact that in the previous section, both the probability and intensity of the impact of risks have been questioned therefore, in order to obtain the total risk score, the probability score is multiplied by the impact intensity score to obtain the total risk score. The descriptive analysis of the total score of value creation risks is presented in table (10).

Table 10. Descriptive indices of the scores assigned to value creation risk items in the rail transportation sector of Mapna Group

Types of risk	Item No.	Risk	Standard division	Average
Risks related to the market and competition	1	Delay in receiving claims	4,1	12,86
	2	The problem of accessing financial resources available abroad	4,29	12,46
	3	Disruption of the government's financial circulation due to the increase or continuation of the level of sanctions	4,31	13,25
	4	Increase in current expenditures and project overhead	4,25	13,26
	5	Reducing the balance in the type of available resources	4,64	12,71
	6	Cash flow problems	3,84	12,14
	7	Changes in credit rules	4,13	12,22
	8	Increase in loan interest rate	3,77	12,01
	9	Increase in exchange rate	3,94	12,03
	10	An increase in the exchange rate and the effect on the status of concluded contracts	4,06	12,47
	11	An increase in the exchange rate and the effect on the status of concluded contracts	4,43	12,96
	12	The willingness of suppliers to enter into a foreign exchange contract	4,5	13,45
	13	The possibility of part of foreign exchange resources being unavailable and limited for special purpose	4,7	13,61
	14	A dramatic increase in costs due to exchange rate fluctuations	4,47	13,89
	15	Changes in laws & regulations related to employers and contractors	3,76	10,25
	16	Prolongation of the clearance process of goods and raw materials needed due to banking problems, as well as changes in internal laws and liquidity issues	4,34	13,54
	17	Confinement the ability to finance towards the implementation of projects	3,8	11,02
	18	Extensive entry of competitors into the new energy market and capturing the market shares	3,77	11,26
	19	Increase in finish cost of goods and services	4,68	13,89
	20	Competitors' exploitation of regional conditions and Iran's conditions in the appropriate direction	۳,۹۲	10,76
	21	Removing or becoming expensive to participate in international tenders	3,78	10,56
	22	Rapid changes in renewable energy technology	4,07	11,98

Types of risk	Item No.	Risk	Standard division	Average
Knowledge and technology	23	Access restriction to international design software	4,12	11,71
	24	The company lagging behind the digital transformation in various industries	4,02	11,57
	25	Increasing the technology gap in the fields of goods and services and limiting the transfer of new technologies	4,46	12,5
Legal, policy and political	26	Possible problems in transferring money abroad	3,84	12,14
	27	Possible problems in project implementation in countries with high political risk	4,13	12,22
	28	Increasing economic and political instability	3,77	12,01
	29	The effect of currency price fluctuations on economic and financial calculations of projects	3,94	12,03
	30	Impossibility of importing equipment and parts needed by the group	4,06	12,47
Risks related to the supply chain and employers	31	Problems of verifying the status of supplies and parts provided from outside the vendor list of employers	3,8	10,87
	32	Restrictions in choosing suppliers due to boycott	3,93	10,96
	33	Loss of existing customers due to economic and political conditions	4,22	11,27
	34	Inability to provide optimal services by domestic contractors	4,22	11,19
	35	Non-acceptance of domestically manufactured equipment by some employers and the possibility of registering a defect due to employers' refusal to replace domestically manufactured equipment with foreign equipment built.	3,44	10,4
	36	The financial power reduction of contractors or internal supply sources	3,37	10,23
	37	The increase in the price of products and the difficulty with contractors due to the increase in the price of raw materials and annual inflation and the increase in inputs	3,38	10,24
	38	The willingness of employers to receive services from abroad and import parts	4,02	10,73
	39	Changing the demands, decisions and preferences of employers	3,63	10,97
	40	Lack of correct cost estimation of expenses and budgeting	3,51	10,66
	41	Delay in delivery, confirmation and payment by the employer	3,91	11,4

Types of risk	Item No.	Risk	Standard division	Average
	42	Limited cooperation of employers in relation towards statements status verification, as well as Letter of credit documents verification for reimbursement of fund	3,45	10,47
	43	Fluctuation and long-term disruption of the supply chain from other countries due to the corona virus pandemic	3,46	10,15
	44	Reducing motivation of the employers towards advance Promotion of investment projects Promotion	3,41	10,65
	45	Delays and procrastination of governmental employers towards project invoices reimbursement	3,59	10,85
Risks related to safety, health and environment	46	Risks caused by human error	3,68	10,66
	47	Accident occurrences in facilities and existed equipment in projects	4,02	11,01
	48	Environmental pollution and destruction of it	4,55	11,81
	49	Spread of poisoning and disease in current projects	3,48	10,79

According to table (10), the index "The sudden increase in costs due to the changes in exchange rate" with an average score of 13.89 has obtained a higher score than other items, and as a result, according to the participants in the research, the greatest risk related to value creation is related to this component. Risks related to the market and competition with an average score of 12.79 have the greatest impact on the value creation process in the Mapna rail transportation department, followed by legal, policy and political risks; risks in the field of knowledge and technology; Risks related to safety, health and environment & risks related to the supply chain and employers are ranked second through fifth.

Table 11. Descriptive indicators of scores assigned to the risk dimensions of value creation in the rail transportation department of Mapna Group

	Average	Minimum score	Maximum score	standard deviation
Risks related to the market and competition	12/79	7/43	16/48	1/78
Knowledge and technology	11/87	20/25	20/25	3/56
Legal, policy and political	12/17	19/00	19/00	3/20
Risks related to the supply chain and employers	10/74	15/47	15/47	1/65
Risks related to safety, health and environment	11/07	19/75	19/75	2/92

4-4- Investigating the existence of a significant difference between the average indices of value creation and risk (Friedman's test)

Table (12) shows the results of the Friedman test for value creation items. Using the results of this test, it can be concluded that the differences between the average ranks of the value creation indicators are statistically significant at the 95% level, and according to the average rating, the reduction of casualties due to road accidents is ranked first, followed by the reduction of environmental degradation. , reducing the production of carbon monoxide and other greenhouse gases, maintaining and improving market share, and environmental assessment are ranked second to fifth.

Table 12. Examining the differences between the average ranks of value creation indicators in the rail transportation department of Mapna Group

Dimensions of value creation		Criteria	Average grade
Economical and financial	1	Affecting on domestic production and reducing foreign exchange	36,97
	2	Reducing the cost of travel for passengers	37,43
	3	Reducing waste and depreciation	39,28
	4	Efficiency	36,03
	5	Reduction of production cost	36,7
	6	Ability to increase production capacity	33,6
	7	Accessing to raw materials	36,16
	8	Existence balance in the available resource	36,11
	9	Accessing to the energy	37,97
	10	Energy consumption	36,27
	11	Maximum usage of production capacity	34,15
	12	Employment	37,18
	13	Production flexibility	34,04
	14	Reduction in travel time	36,06
The whole dimension			31,57
Organizational	15	Manpower interactions with each other	25,69
	16	Accumulation of knowledge and experience	32,76
	17	Group participation and willingness towards employee's cooperation	24,42
	18	Investment in social programs	25,2
	19	Skills and knowledge of employees	25,19
	20	Employee incentive plan	24,9
	21	Employee training program	24,76

Dimensions of value creation		Criteria	Average grade
	22	Long-term strategies	28,38
	23	Interaction and partnership with the government	29,21
	24	Interaction and partnership with suppliers	30,31
The whole dimension			24,76
Customer requirement	25	Obtaining customer confidence and requirements	34,47
	26	Providing quality products and services	36,86
	27	Providing products or services with innovative features	37,18
	28	Ensuring the customers easy access towards products and services at any time	34,91
	29	Customer satisfaction towards a quick and favorable response for their new orders	33,03
	30	Having continuous and favorable relationships with the customers	34,11
	31	Provide special offers towards customer's satisfaction	35,73
	32	Long-term relationships with customers	35,57
	33	Interaction with customers to provide a better service to them	33,53
	34	Quick response towards customer complaint	35,15
	35	presenting the best quality towards after-sales service	39,22
	36	Increase the level of services	38,15
The whole dimension			32,63
Marketing	37	Distribution strategy	25,79
	38	Marketing strategy	40,54
	39	Number of distribution channels	24,62
	40	Maintain and improve marketing share	41,41
	41	Covering a wide range of products and services	39,56
The whole dimension			31,94
Pricing	42	Fair pricing policies for entire customers	32,87
	43	Consistent and accurate pricing policies	31,25
	44	Providing quality products and services at reasonable prices	35,84
The whole dimension			32,93
Technology	45	Investment in R&D	31,46
	46	Technological capabilities	33,04

Dimensions of value creation		Criteria	Average grade
	47	technology management	32,15
	48	Use of new and up-to-dated equipment and technologies	36,09
	49	Cooperation with foreign companies and technology transfer	37,03
	50	Reverse Engineering	37,79
The whole dimension			33,28
Infrastructure	51	Access to new ways	40,21
	52	Infrastructure features	36,95
	53	Ability to innovate and recreate	37,53
	54	Ability to expand related involved business activity	37,6
	55	geographical location	38,27
The whole dimension			35,81
Health & Environmental	56	Reducing the production of carbon monoxide and other polluting gases	41,63
	57	Reduce noise pollution	38,19
	58	Reducing environmental degradation	42,43
	59	Reducing casualties caused by road accidents	43,15
	60	Waste management system	40,1
	61	Environmental Assessment	40,92
The whole dimension			41,07

According to the results of the Friedman test, in order to improve the value creation in the railway sector of Mapna Group, the primarily Focus could be on safety standards as well as, increasing the quality level of the rail fleet production; Because the improvement of this particular issue would definitely affect the reduction of road casualties. Furthermore, considering the significant role of environmental factors in creating value in Mapna Group's rail complex, all measures will lead to the improvement of environmental conditions and reduction of waste and air, pollution will have an effective role in creating value. Table (13) shows the results of Friedman's test to check the existence of a significant difference in the average rating of the risk criteria of value creation. By using the results of this particular test, it can be concluded that the differences between the average ratings of value creation risk criteria are statistically significant at the 95% level hence, The dramatic increase in costs due to the changes in the exchange rate is ranked first, then followed by the increase in the cost price of production items and services, the prolongation of the clearance process of goods and raw materials required due to banking problems , thus changes in domestic laws and liquidity issues and the possible case of unavailability of a portion of foreign exchange resources abroad and as well as being restricted towards special purposes are ranked second to fifth.

Table 13. Examining the differences between the average ratings of value creation risk criteria in the rail transportation's sector of Mapna Group

Type of risk	Item No.	Risks	average rank
Risks related to the market and competition	1	Delay in receiving claims	32,53
	2	The problem of accessing financial resources available abroad	32,24
	3	Disruption of the government's financial circulation due to the increase or continuation of the level of sanctions	31,38
	4	Increase in current expenditures and project overhead	31,24
	5	Reducing the balance in the type of available resources	30,92
	6	Cash flow problems	30,31
	7	Changes in credit rules	29,88
	8	Increase in loan interest rate	29,14
	9	Increase in exchange rate	28,99
	10	An increase in the exchange rate and the effect on the status of concluded contracts	27,89
	11	The dependence of the group's income on the financial and economic conditions of the government	27,51
	12	The willingness of suppliers to enter into a foreign exchange contract	27,51
	13	The possibility of part of foreign exchange resources being unavailable and limited for special purpose	27,48
	14	A dramatic increase in costs due to exchange rate fluctuations	27,32
	15	Changes in laws & regulations related to employers and contractors	26,68
	16	Prolongation of the clearance process of goods and raw materials needed due to banking problems, as well as changes in internal laws and liquidity issues	26,68
	17	Confinement the ability to finance towards the implementation of projects	26,5
	18	Extensive entry of competitors into the new energy market and capturing the market shares	26,5
	19	Increase in finish cost of goods and services	26,29
	20	Competitors' exploitation of regional conditions and Iran's conditions in the appropriate direction	26,29
	21	Removing or becoming expensive to participate in international tenders	26,16

Type of risk	Item No.	Risks	average rank
Knowledge and technology	22	Rapid changes in renewable energy technology	26,16
	23	Access restriction to international design software	25,87
	24	The company lagging behind the digital transformation in various industries	24,71
	25	Increasing the technology gap in the fields of goods and services and limiting the transfer of new technologies	24,33
Legal, policy and political	26	Possible problems in transferring money abroad	24,33
	27	Possible problems in project implementation in countries with high political risk	23,9
	28	Increasing economic and political instability	23,42
	29	The effect of currency price fluctuations on economic and financial calculations of projects	23,19
	30	Impossibility of importing equipment and parts needed by the group	23,05
Risks related to the supply chain and employers	31	Problems of verifying the status of supplies and parts provided from outside the vendor list of employers	22,96
	32	Restrictions in choosing suppliers due to boycott	22,42
	33	Loss of existing customers due to economic and political conditions	22,30
	34	Inability to provide optimal services by domestic contractors	22,26
	35	Non-acceptance of domestically manufactured equipment by some employers and the possibility of registering a defect due to employers' refusal to replace domestically manufactured equipment with foreign equipment built.	22,03
	36	The financial power reduction of contractors or internal supply sources	21,99
	37	The increase in the price of products and the difficulty with contractors due to the increase in the price of raw materials and annual inflation and the increase in inputs	21,97
	38	The willingness of employers to receive services from abroad and import parts	21,89
	39	Changing the demands, decisions and preferences of employers	21,65
	40	Lack of correct cost estimation of expenses and budgeting	21,42
	41	Delay in delivery, confirmation and payment by the employer	21,21

Type of risk	Item No.	Risks	average rank
	42	Limited cooperation of employers in relation towards statements status verification, as well as Letter of credit documents verification for reimbursement of fund	21,15
	43	Fluctuation and long-term disruption of the supply chain from other countries due to the corona virus pandemic	21,07
	44	Reducing motivation of the employers towards advance Promotion of investment projects Promotion	20,94
	45	Delays and procrastination of governmental employers towards project invoices reimbursement	20,57
Risks related to safety, health and environment	46	Risks caused by human error	20,56
	47	Accident occurrences in facilities and existed equipment in projects	20,21
	48	Environmental pollution and destruction of it	20,18
	49	Spread of poisoning and disease in current projects	19,77
580,26	Chi-square statistic		
0,000	Significance level		

In order to manage and controlling identification risks, there are different solutions, these solutions and strategies are presented in table (14).

Table 14. Suggested strategies for risk management and control

Type of risk	Risk	Proposal solutions and strategies to deal with risk
Risks related to the market and competition	Delay in receiving claims	Obtaining loans and transferring loan interest to claims from employers
	The problem of accessing financial resources available abroad	Making more usage of the capacities of the international field
	Disruption of the government's financial circulation due to the increase or continuation of the level of sanctions	Cash flow management
	Increase in current costs and project overhead due to the corona virus pandemic	Stopping the project, In case of employer failure
	Reducing the balance in the type of available resources	Negotiating with the government to facilitate the conversion of resources
	Cash flow problems	Internal manufacturing incensement of the main important equipment (with the aim of reducing the price)

Type of risk	Risk	Proposal solutions and strategies to deal with risk
		Optimal management of expenditures and liquidity
		Review the structure of the organization according to the existed conditions in order to increase the productivity
		Negotiating with the government towards bartering and clearing the debts and claims
	Changes in credit rules	reduce financing costs and expenses with respect to management control
	Increase in loan interest rate	Diversity in financing tools through the capital market
	Effects on exchange rate increase	Anticipation of Rial /currency adjustment clause in contracts
	An increase in the exchange rate and the effect on the status of concluded contracts with the contractors	Concluding currency contracts with employers and predicting guidelines for the adjustment of the Rial portion based on government approvals
	The dependence of the group's income on the financial and economic conditions of the government	Defining new projects as B2C and concluding contracts with the private sector and using intra-group investment
	The willingness of suppliers to enter into a foreign exchange contract	Signing a foreign exchange contract with the employer
	The possibility of part of foreign exchange resources being unavailable and limited for special purpose	Examining parallel strategies for currency transfer and concluding contracts with foreign companies without the need for currency transfer
	A dramatic increase in costs due to exchange rate fluctuations	Increasing internal construction as well as increasing the Rial part of the project.
	Changes in laws & regulations related to employers and contractors	Consultation with the top officials of the mentioned organizations
	Prolongation of the clearance process of goods and raw materials needed due to banking problems, as well as changes in internal laws and liquidity issues	Obtaining special permits for clearance with regard to the facilities towards removing production obstacles and pursuing solutions for bartering the debts of the customs import duties with the demands of the Mapna group from the government.
	Limitation of the group's ability to finance To implement projects with a financing commitment	Trying to attract the participation of domestic and foreign financiers

Type of risk	Risk	Proposal solutions and strategies to deal with risk
	Providing diverse offers by the competitors to the market with an emphasis on providing financing solutions for projects, especially in foreign markets	Creating and formation towards specialize center for financial solutions
	Extensive entry of competitors into the new energy market	New investment enhancement, partnership with other competitors
	gain in finish cost of goods and services	Management of finished cost and profit margin
	Competitors' exploitation of regional conditions and Iran's conditions in the appropriate direction	Participating in tenders in the form of a consortium along with powerful foreign competitors and participating in less attractiveness markets with competitors.
	Removing or Mapna's participation in expensive international tenders	Reviewing new foreign target markets with less restriction from a financial and technical point of view and with stronger presence in those markets
Knowledge and technology	Rapid changes in renewable energy technology	Strategic outsourcing of technology change management in this area through Joint Venture
	Rapid changes in renewable energy technology	Providing internal design software; buying software through intermediary companies
	The company lagging behind the digital transformation in various industries	Investing in digital products with considerations of cybersecurity
	Increasing the technology gap in the fields of goods and services and limiting the transfer of new technologies	Development of technological capabilities; Full definition and implementation of the technology management process and partnership with foreign research and development centers
Legal, policy and political	Possible problems in transferring money abroad	Implementation of alternative solutions
	Possible problems in project implementation in countries with high political risk	Monitoring environmental conditions and close communication with embassies
	Increasing economic and political instability	Review and improve the definition process, creating and implementing projects with domestic and foreign clients; defining new businesses according to competitive advantages and the capabilities of the group; Redefining current businesses (exiting or continuing business activity)
	The effect of currency price fluctuations on economic and financial calculations of projects	Detailed or precise review by using experienced advisors to meet the short- and medium-term effects on exchange rate fluctuations

Type of risk	Risk	Proposal solutions and strategies to deal with risk
	Impossibility of importing equipment and parts needed by the group	Trying to build domestically within the company or identifying small knowledge-based enterprise and supporting them to build domestically
Risks related to the supply chain and employers	Problems of verifying the status of supplies and parts provided from outside the vendor list of employers (as necessary)	Obtaining the employer's approval regarding to supply items outside the vendor list attached to the contract on a case-by-case basis at the time of implementation by the project manager
	Restrictions in choosing suppliers due to boycott	Identifying and using knowledge-based enterprise
	Loss of existing customers due to economic and political conditions	Expansion of customer-oriented culture and improving the quality of products and services in order to increase the level of satisfaction;
	Inability to provide optimal services by domestic contractors	Replacing the contractors who are unable retrieve themselves; Monitoring the key contractors' statues and assisting them to survive.
		Reinforcement of manufacturing by the Factories of the company's complex
		Maximum avoidance of the new investments and usage of the existing infrastructure
		Considering contractual or non-contractual financial facilities to assist domestic manufacturing replaced by the contractor's, import department
	Non-acceptance of domestically manufactured equipment by some employers and the possibility of registering a defect due to employers' refusal to replace domestically manufactured equipment with foreign equipment built.	Review the long list of suppliers for future projects and contract new domestic manufacturers in it; negotiating with previous employers to accept new domestic manufacturers.
	The financial power reduction of contractors or internal supply sources	The program of compiling financial packages to contractors in accordance with the conditions of the projects in a win-win manner; Using the capabilities of knowledge-based industrial and manufacturing enterprise
	The increase in the price of products and the difficulty with contractors due to the increase in the price of raw materials and annual inflation and the increase in production inputs	Planning and providing the resources needed for the cumulative purchase of raw materials and foreign accessories and parts

Type of risk	Risk	Proposal solutions and strategies to deal with risk
	The willingness of employers to receive services from abroad and import supplies and parts	Logically increasing the quality of services and products; Real attention to customer orientation from the beginning to the end of the life cycle of the products; rationalizing the import tariff in order to support domestic production; Partnership with foreign competitors and owners of advanced technologies
	Changing the demands, decisions and preferences of employers	Inserting a contractual clause to compensate for expenditure and time
	Lack of correct cost estimation of expenses and budgeting	cost management and control and expenditure minimization; implementation of risk management before the conclusion of the contract, during the implementation of the project
	Delay in delivery, confirmation and payment by the employer	Taking the necessary measures when signing into a contract; Application and development of planning and control requirements in the contract; observing the proportionality of the physical progress of projects with their financial progress
	Limited cooperation of employers in relation towards statements status verification, as well as Letter of credit documents verification for reimbursement of fund	Anticipating the items in the contract and, if necessary, stopping the activities until receiving the amount of the documents
	Fluctuation and long-term disruption of the supply chain from other countries due to the corona virus pandemic	Replacing the vendors or the domestic manufacturing of accessories and parts
	Reducing motivation of the employers towards advance Promotion of investment projects Promotion	Active bargaining and trying to play a role in policy-making within the framework of the interests of the parties
	Delays and procrastination of governmental employers towards project invoices reimbursement	Negotiating with the employer and obtaining the necessary guarantees
Risks related to safety, health and environment	Risks caused by human error	Culture building at the operational level Use of professional evaluators outside the company.
	Accident occurrences in facilities and existed equipment in projects	Carrying out protective and preventive control measures -Creation of MS-HSE system - Elaboration of the evaluation mechanism of projects in the field of HSE
	Environmental pollution and destruction of it	Creation of MS-HSE system =Establishment of Total HSE system -Creating a waste management system -Environmental assessments

Type of risk	Risk	Proposal solutions and strategies to deal with risk
	Spread of poisoning and disease in current projects	<ul style="list-style-type: none"> -Creation of MS-HSE system -Salmet’s control and inspection system -Conduct periodic tests and examinations -Preparation of the protocol and implementation method of preventive measures to prevent the spread of the disease caused by the corona virus pandemic

5- Conclusions and suggestions

Value management or value-based management emphasizes on setting specific goals, increasing productivity and innovation, improving organizational performance and ultimately return on investment. Of course, what is considered value in value-based management differs depending on the individual or stakeholder group. Value-based management is based on four principles, which are:

- strengthening value orientation,
- Using contemplation thinking,
- Using a structured comprehensive approach,
- Managing complexity, risk and uncertainty.

The Four motives of common management style, positive human dynamism, consideration of the internal and external spaces, and finally the correct usage of methods and tools definitely would support these four principles. In short, it can be said that value management creates sustainable value. This value may be at the product level, project, process, or even will be at organizational or social level. In this study, Value management is considered at the project level in the rail transport sector of Mapna Group. Based on the results obtained in this study, long-term value creation means the final realization of the potential of Mapna Group's rail transportation's sector projects. So that the interests of the beneficiaries and owners and even their contribution to the society depend on the creation of long-term value. The characteristics of value creation in railway projects can be basically categorized into four general subcategories: economic, social, environmental and physical. In the first step, a framework should be defined on the quality of the project itself, on the governance of the project and the participation of owners and users during the initial planning. However, controlling the risks of improving the value creation of the project requires the use of solutions, the main solutions of which are presented in table 14 of this article (suggested strategies for risk management and control). According to the results of the Friedman test, in order to improve the value creation in the railway sector of Mapna Group, we can focus primarily on improving the safety standards of production trains and increasing the quality level of the rail fleet; because the improvement of this issue will definitely affect the reduction of road casualties. In addition, considering the significant role of environmental factors in creating value in Mapna Group's rail complex, all measures to improve environmental conditions and reduce waste and air pollution will have an effective role in creating value. According to the average ranking of the effective factors in value creation, the sudden increase in costs due to the change in the exchange rate is ranked first, followed by the increase in the finished cost of production items and services, the prolongation of the clearance process of goods and raw materials required, due to banking problems. , changes in domestic laws and issues of liquidity provision and the possibility of a part of foreign exchange resources being unavailable and limited for special purposes are ranked second to fifth. In line with the answer to the third question of the research (how to increase value creation in Mapna rail transportation's projects?), based on the findings of the research, the suggested activities and measures to be taken have been introduced. Based on the results of the research, both the findings of the existing literature and the findings through the questionnaire can be used as a conceptual framework to increase value in rail projects. Strategies such as, strategic analysis (such as stakeholder analysis, uncertainty

analysis, goal, procurement, project delivery model, contract model, project objectives priorities), Selection of value team: ("value team" refers to the project team prepared with focus), Identifying the value and value proposition and developing the plan, validation, implementation (after validation, contractors prepare a plan for action and production), launch and transfer, and finally value evaluation can be considered by value creation management. Finally, we recommend that the technical contractors' importance—from the early phase through the planning and construction phases—especially interesting and puzzling.

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