



Interpretive Structural Modelling of Attitude Change Based on Cognitive Dissonance (Railway Transportation Industry)

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ARTICLE INFO

Article type:
Research Article

Article History:
Received 02 March 2022
Revised 02 December 2022
Accepted 07 December 2022
Published Online 09 September 2023

Keywords:
Consumer attitudes,
Consumer behavior,
Cognitive dissonance approach,
Railway transportation.

ABSTRACT

When individuals encounter conflicting cognitions, the motivation to mitigate the dissonance can result in a modification of one of their cognitions. Altering attitudes is one approach to achieving this objective, serving as a strategy to alleviate cognitive dissonance by adjusting cognitions associated with the attitude. This study aims to construct an interpretive structural model of attitude change grounded in cognitive dissonance within the railway transportation industry. Employing a mixed research design, the qualitative phase involved semi-structured interviews with experts, while the quantitative phase encompassed the development and distribution of a paired questionnaire among the statistical population of the railway transportation industry. During the qualitative phase, the theme technique yielded 6 overarching themes and 36 organizing themes. These themes were subsequently subjected to analysis using the interpretative structural modeling technique, categorizing them as autonomous, dependent, linked, and independent variables. One of the limitations of this study is the absence of similar research conducted in Iran.

Cite this article: Ashouri, F & Azad, N. (2023). Interpretive Structural Modelling of Attitude Change Based on Cognitive Dissonance (Railway Transportation Industry). *Iranian Journal of Management Studies (IJMS)*, 16 (4), 811-826. DOI: <http://doi.org/10.22059/ijms.2022.339830.674994>



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DOI: <http://doi.org/10.22059/ijms.2022.339830.674994>

1. Introduction

Every decision that a consumer makes includes to some extent a phenomenon that psychologists call attitude. Being aware of the individuals' attitudes can be of great importance because in such cases we can predict their behavior and control them. Attitude is the probability of the reoccurrence of certain types of behavior with a specific direction (Karimi, 2022). Initial changes in beliefs, attitudes, information and even the way of doing things and shifting priorities are done through mental models. Changing institutionalized attitudes, considered predictors of behavior, is naturally difficult and radically needs more time (Sloboda & Lagerqvist, 2022). Cognitive dissonance is reduced in various ways, which are evaluated according to the attitude of consumers. Of course, the past experiences of consumers should be considered (Bachelioulis and Brissimis, 2019)¹.

Therefore, changing the attitude and identifying its themes can affect any industry directly and indirectly, ultimately causing a change in consumer behavior for which methods related to persuasion as well as identification of factors related to cognitive dissonance should be used. One way to change attitude is to create dissonance in the person's cognitive system, which can be implemented in different ways. Basically, it is done by providing information to the person which is different and sometimes contradictory to his beliefs. This makes the person change his cognitive system which includes his attitudes. Special attention should be paid to factors such as the purpose of attitude change, and the type of communication with customers in the process of cognitive dissonance to change consumer behavior.

This study aims to provide an interpretive structural model regarding the change in the attitude of consumers of railway transportation services. Thus, the themes obtained in the qualitative part of the study were examined and the level determination chart was challenged through the studies of the MICMAC² matrix.

This study primarily aims to obviate the issues such as knowledge of the transportation capacity and attitude towards this industry, improvement of the capacity position, use of new technology, improvement of the strategic position, and an increase in Rial and foreign exchange income. This will come true by changing the attitude of consumers of railway transportation services based on cognitive dissonance by designing an interpretive structural model. By presenting the model it is aimed to analyze the variables, improve the position of the railway transportation industry and change the attitude of its consumers to increase industrial development and compete with developed countries so that with economic development it will be a suitable platform for the development of the country compared to other countries.

The main hypothesis of the research states that environmental factors are effective on consumers' attitudes by mediating variables of creating positive attitudes, customers' responsiveness, organizational factors, and railway transportation conditions.

2. Statement of the problem

Attitude is a set of beliefs, emotions, and behavioral intentions towards an action or behavior and includes the organized mental or nervous states of a person's responses to all the issues and situations in which he is placed. In some way, attitude shapes behaviors, creates motivations, satisfies needs, and directs tendencies. Consumers' attitude is directly related to their behavior and their expected values (Jorge et al., 2020). Evaluating consumers' attitudes can predict their feedback (Castillo et al., 2019).

One way to change the attitude is to create dissonance in the person's cognitive system which can be implemented in different ways. It is done basically by providing information to the person that is different and sometimes contradictory to his beliefs. This makes the person change his cognitive system which includes his attitudes. To change consumer behavior, special attention should be paid to factors such as the purpose of the attitude change process and the type of communication with customers according to the theory of cognitive dissonance. Therefore, predicting the behavioral changes of customers is important (Hofer³ et al., 2020).

Accordingly, one of the most important factors affecting consumer behavior is cognitive

1. Bachlioulis and Brissimis, 2019, P.3

2. Matrix of Crossed Impact Multiplications Applied to a Classification

3. Hofer et al

dissonance. According to Leon Festinger's theory of cognitive dissonance, a lack of coherence and inconsistency between two cognitions causes a disturbing motivational state. The dissonance reduced in different ways, prompts a person to reduce the inconsistency between his cognitions and this dissonance. Communication culture and its consequences can reduce cognitive dissonance among consumers to create awareness (Nasser Azad et al., 2022). Cognitive dissonance completely depends on people's perceptions, knowledge, opinions, and psychological conditions and leads to changes in people's opinions based on inconsistent elements. People use information distortion to reduce cognitive dissonance as well because reduced cognitive dissonance results in stress reduction. On the other hand, this issue can be related to people's psychological conditions, based on which, people feel injustice and try to minimize this dissonance so that they can defend their opinions (Pirie, 2018).

Therefore, by applying appropriate strategies to reduce cognitive dissonance and to change the attitude of consumers, the capacity of railway transportation can be used. This issue can even increase the capacity of the industry, and providing that no problem is created, it will lead to an increase in cognitive dissonance and ultimately an inappropriate change in the attitudes of the consumers.

All over the world, the transportation industry is of a special place and is considered one of the main dimensions of social welfare as well as economic development in any society. Therefore, the Islamic Republic of Iran is among the countries that benefit from good transits due to its very suitable geographical position. By changing the attitude of the consumers of transportation services to railway transportation, these benefits can be optimally used to increase foreign exchange earnings and improve its strategic position in the region.

The development of the railway transportation network undoubtedly is a priority and it has a fundamental role in infrastructure and balanced and sustainable development. Further, it contributes significantly to the net national product and undeniably is a prerequisite in the development of the economic sector, trade and industry, agriculture, and other sectors. According to the comparative report of the Railway Research Center, fuel consumption per 1000 tons of cargo per kilometer on the road is 9.104 liters, but in the railway industry it is 1.000 liters, and for 1000 passenger-kilometers on the road, it is 10 liters and 7 liters on the rail. The railway system saves approximately 3100 billion Tomans in fuel consumption per year, leading to the reduction of air pollution. Saving fuel consumption leads to an increase in mass transportation, a reduction in the total cost of the country, and environmental protection as well as noise pollution due to the frequency range. This is not only the policy of supporting railway transportation but also the competitor of this sector, i.e. road, has been given a fuel subsidy of 20 times (Nasser Azad et al., 2022).

In our country, about 10% of cargo is transited by rail, and compared to developed countries, the inequality in the share of the rail and road market is much greater which does not fit with the law on the development of public transportation and fuel consumption management. However, considering the good spread of Iran's border railway network, it is possible to increase the share of this type of transportation compared to the current situation by taking appropriate measures (Esfahani et al., 2021). Of course, this issue requires the confidence of cargo owners in the railway and their guarantee. For this reason, Iran Railways has planned to build scheduled railways and on the other hand, it is ready to pay demurrage to the cargo owner if it cannot fulfill its time commitment in delivering cargo, according to the contract and tariffs.

Furthermore, the factors affecting the identified transit corridors include transportation cost, route safety, reliability, wagon tracking capability, commercial speed, and transportation frequency (Esfahani et al., 2021). For the construction of two-lane railways, less land is required, while the construction of a road requires 3 times as much asphalt and environmental changes, and the cost of highway construction is at least 3 times compared to railway transportation. For this purpose, railway transport, which is called green transport, leads to more development of the country and national security as well as a reduction in transit costs and fleet maintenance. Currently, the railway line transports 10% of the country's cargo and 18% of the country's passengers, including 90 km, while it is 40% in the world (Nasser Azad et al., 2021).

Today, transportation is one of the important national infrastructures and due to its fundamental role, it has a great impact on the economic growth of the country. This section includes extensive operations in the areas of production, distribution, and consumption of goods and services and plays an undeniable role in economic activities (Farohid & Ilkah, 2021). The safety of traveling by railway

transportation is 330 times safer than road transportation. In addition, railway transportation is effective in the distribution of incomes and the reduction of economic and social inequalities. Without the existence of a rail transportation network, facilities and auxiliary equipment, and a favorable fleet, the country's general growth, and development seem impossible (ibid.)

Changing the attitude of consumers, deeply recognizing advantages of railway transportation in the country and the important and effective role of culture making for the widespread use of railway services can be effective for economic development and production of more infrastructures (Azad et al., 2021).

3. Significance of the study

Every decision that a consumer makes is partly subject to a phenomenon that psychologists call attitude. Beliefs, attitudes, and behaviors are very closely related and play a key role in examining consumer behavior (Ezmi et al., 2017). Attitude shows an orientation about a subject, an opinion, and an action. Attitude is agreement or disagreement with ideas that are neither related to the past nor basically the present, but as a rule, related to the future. The subject of the attitude may be abstract or objective. Whatever a person recognizes or keeps in his mind can be a matter of attitude, however, this does not mean that the person's attitudes are endless (Aghaei et al., 2021).

Attitudes and beliefs can shape behaviors over time. On the other hand, a reciprocal relationship exists between behaviors and attitudes, but once a behavior is formed through beliefs and attitudes, it cannot be changed simply unless these attitudes and beliefs change significantly (Farahani, 2019). Attitude consists of three elements including cognitive, emotional, and readiness for doing. In some definitions, attitude is considered a lasting system of evaluations, or a lasting organization of beliefs. The term system or organization implies that there is a relationship between the three components. This means that a person's cognitions about something are affected by his feelings and passion about that thing and his tendencies to act towards that thing (Karimi, 2021). Attitude indicates an orientation about a subject, an opinion, or an action. Attitude shows agreement or disagreement with things, which is neither related to the past nor basically the present, but as a rule, it is related to the future. The subject of the attitude may be abstract or objective. Whatever a person cleans or keeps in his mind, can be a matter of attitude. But this does not mean that a person's attitudes are endless (Aghaei et al., 2021).

Attitudes, which result from a person's experiences, shape his world and make it stable, but since the outside world is constantly changing and transforming, human attitudes must inevitably adapt to these changes. Thus, it can be said that attitude changes are the psychological consequences of social changes (Nobari, 2019). In other words, attitude change can be both the cause of behavior change and the result of behavior change (Karimi, 2021). When a person is obliged to adopt a social situation contrary to his attitudes, as the theory of cognitive dissonance predicts, this conflict will change the person's attitude and the person will experience anti-attitude defense (ibid. p. 144).

In this research, among the different theories of attitude change, we used the cognitive dissonance approach. This theory, which was first stated by Leon Festinger in 1957, has been the most famous and most important example of cognitive co-adaptation patterns. This theory, with its very simple basic assumptions, is used not only in the field of attitude change but also in various other fields of social psychology. When a person has two simultaneous cognitions that contradict each other, it is said that he has cognitive dissonance. Cognition includes thoughts, attitudes, beliefs, and even behaviors that a person is aware of (Karimi, 2021). The underlying idea of this theory states that people seek stability in their attitudes and beliefs in any situation where the two are dissonant. This theory is utilized when a thought or feeling is inconsistent with a prior action, thought, or feeling as well (T. Papanico, 2022).

Festinger believes that the conflict between two cognitive elements within a person forms the basis of attitude change. Two cognitive elements become dissonant when the approval of one leads to the denial of the other which occurs when a person has opposing beliefs or even opposing attitudes and behaviors. According to Festinger, a person who knows that he has two dissonance cognitive elements feels an unpleasant state of tension. Internal conflict manifests itself with an unpleasant increase in the physiological arousal of the body. The greater the important cognitions and their deviation from each other, the greater the dissonance will be. In this case, in addition to trying to reduce the dissonance, a

person actively avoids situations and information which is likely to increase dissonance (Hosni et al., 2021).

Today, the experience and emotions of consumers form the marketing paradigm (Farzi et al., 2018). The life cycle of products and services is based on the level of perception and participation of consumers (Ali et al., 2018). Therefore, predicting the behavioral changes of customers is important (Hofer et al., 2020) which can be done by evaluating customers' experiences (Pliers and Pansin, 2020). Marketing strategies are fully explained using consumer attitudes (Shu et al., 2020). Customers' behaviors change according to the competitors' strategies and environmental changes (Lee et al., 2021). Customers' behavior is recognized by their culture (Singh et al., 2021), and evaluating customers' behavior and their behavioral changes model the type of strategy and activity of organizations (Sandarara and Rajish, 2021). Therefore, value is created through the experiences and intentions of customers (Im et al., 2024).

Railway transportation is the main core of transportation systems and methods in the leading countries of the world, apart from the many economic and social benefits. The importance of this system is the extent that it is used as an indicator for determining the level of country development. In our country, given the increasing growth of urbanization, economic and environmental concerns, and obviating the needs of society, special attention has been paid to safe, fast, and efficient transportation and the development of railway transportation in recent years (Elyasi et al., 2019).

No advanced economic cycle in the global, national and local economic system is possible without transportation, and railway transportation is considered one of the most important variables. The development of transportation infrastructures and most importantly maximum utilization of it given the geographical location of the country is effective in creating strategic partnerships with neighboring countries, forming alliances, and new geopolitical and geoeconomic districts. Hence, countries that can create a geostrategic alliance with their neighbors and benefit from their geographical location can make a direct investment in the development of infrastructure and implementation of facilities, equipment, and advanced technologies of the transportation industry due to the requirements and preparations of transit (Akhbari, 2022).

Transportation, as a key factor for different societies, plays a significant role in the growth and development of a society. The development of the transportation system causes fundamental changes in economic activities and attracts more population and further develops economic activities in different areas.

Railway transportation is of great importance as it can be considered a platform for economic development. Proper and accurate planning in this field and improvement and organization of transportation infrastructures reduce operating and production costs and has a positive effect on the economy of a society (Haydarpour et al., 2021), which is discussed in this research within the inclusive theme of "environmental factors".

In the development of transportation, no discrimination should be made between people and generations, and social justice should be established. Employing facilities such as policies in the field of receiving fees, service level, infrastructure conditions, and in the transportation sector can help low-income people in society to meet their transportation needs (Haydarpour et al., 2021), which this research is discussed within the inclusive themes of "creating a positive attitude" and "railway transportation conditions".

Transportation is easily affected by the change in the culture, consumption patterns of the society, and the habits and structures of the country. The cultural growth of society causes a change in the demands and social goals (Haydarpour et al., 2021), which is analyzed as one of the inclusive themes of "Consumer Attitude" and "Responsiveness to Customers" in the present study.

Access to a greater choice for the railway transportation system requires a change in the attitude of consumers toward transport services. It means that changing the thinking way of consumers and providers of rail transport services depends on some factors. These issues include research on how to solve problems related to integrated, dynamic, continuous policies and guidelines to improve economic, social, and environmental goals (Haydarpour et al., 2021) which has been analyzed within the inclusive theme of "organizational factors" in this study.

4. Research literature

Esfahani et al. (2019) in an article entitled "Dynamic model of evaluating and measuring the desirability of railway transit corridors" showed that the application of scenarios of the wagon tracking system will increase the commercial speed and improve reliability. In addition, the provision of some discounts by the transport companies at the same time can play a significant role in increasing the desirability of this railway transit corridor, which this research has not addressed the change of attitude and factors of its change.

Mansour et al. (2017) in an article titled "The effect of choice reversibility on attitude change in cognitive dissonance" reported that positive attitude change occurs only in irreversible choices. Therefore, sellers of goods and services shouldn't make the process of exchanging goods too smooth to help the attitude become more positive. This study did not evaluate change in consumer behavior.

Michel et al. (2021) reviewed an article entitled "Positive affection and behavior change" and concluded that positive affection and behavior can be promoted by presenting it as an appropriate reward for change, which attitude change has not been examined in this study.

Verna et al. (2019) in an article on "values and responsibility for predicting consumer behavior" showed that the attitude toward creating value-oriented conditions in the environment can predict appropriately consumer behavior. This research is only about perceived values and created environmental values and failed to consider other factors.

5. Method

This study is mixed research and of exploratory type. It is based on an interpretive paradigm and the research approach is inductive. The research method is a survey and mixed (qualitative and quantitative) conducted in a cross-sectional period. Data was gathered using interviews and questionnaires.

To collect data and conduct the qualitative part, theme analysis and semi-structured interviews with 8 informants (participants) were done who had at least 5 years of experience in the transportation and marketing industry. Table 1 shows the demographic information of the participants.

Table 1. Frequency of respondents' information

Criteria	Education	Related job experience	Production of scientific value	Entrepreneurship	Degree of education
Row	Gender		Age		degree of education
1	Women %77		18-24/14%		Diploma %12
2			25-35/20%		BA %44
3	36-45/50%		MA %30		
4	46 above/ %16		Ph.D. %14		
	Men %23				

The qualitative and quantitative part of this study was carried out as follows. To present a qualitative model, basic, organized, and inclusive coding was done after the implementation of the protocol and interviews with experts. In the quantitative part, to provide a model, interpretive structural modeling (ISM)¹ was used through a paired questionnaire with 6 respondents. To validate the model, with access to the statistical population of 12 million travelers in the period of data collection from May to September 2017, a sample of 384 people was selected through Cochran's formula who filled out the questionnaire. In the next step, the internal and external model was evaluated using the PLS-SEM² technique. The relationships between themes are presented as follows through Maxqda software.

1. Interpretive Structural Modelling

2. Structural Equation Model

Interviewee's code	Free coding	Interview text
Q1	<p>Consumer attitude (security, comfort, price, customer satisfaction)</p> <p>Railway transportation condition (identifying use capacity, flexible timing, providing new trains, privatization, price increase, updating costs)</p> <p>Creating new attitude (demand prediction, flexible pricing, providing suitable services, advertisement)</p> <p>Customer responsiveness (survey, responding to complaints, informing)</p> <p>Consumer attitude (customer satisfaction, providing facilities)</p> <p>Organizational factors (employees' training, managers' and employees' attitude change)</p>	<p>Even though people know that railway transportation is safer, more peaceful, and comfort compared to private cars, they still move around in private cars. In summer when people use the train more and there is more tourism, we do not have even one empty seat and this is the weakness of the system that we cannot meet the needs. In the past years, we used more than 90% of the available capacity. While due to the shortage and very little allocation of funds during the holidays and the peak of summer and travel, we have very few trains and cannot respond to customer demand. Further, there are positive factors such as price, and final cost, which help a lot in choosing railway transportation, and since 2009 we have gone towards privatization and all railway companies have been privatized, leading to increased costs. Furthermore, in the railway sector, the prices are flexible and different services are offered at different times, which allows the customer to be free in choosing the type and time of the train according to her budget, preferences, and limitations. In addition, a management called performance evaluation management responds to complaints. It receives complaints in different ways and obtains different mechanisms to resolve and satisfy the customer. Public relations are in charge of advertising and checking the weakness of advertising. Since 2009, it has been transferred to the Social Security Organization and privatized, it has advantages and disadvantages. Departments of communication with the customer should be validated, and on the other hand, the customer within the organization, which is human resources, how much money will be spent on the organization's colleagues and employees for upgrading, whether it is financial cost or training class cost, so that these employees can improve their attitude towards the transportation organization. Change. Therefore, the main challenge is to investigate how to change the consumer's attitude toward railway services.</p>

Figure 1. Coding sample of the interviewee

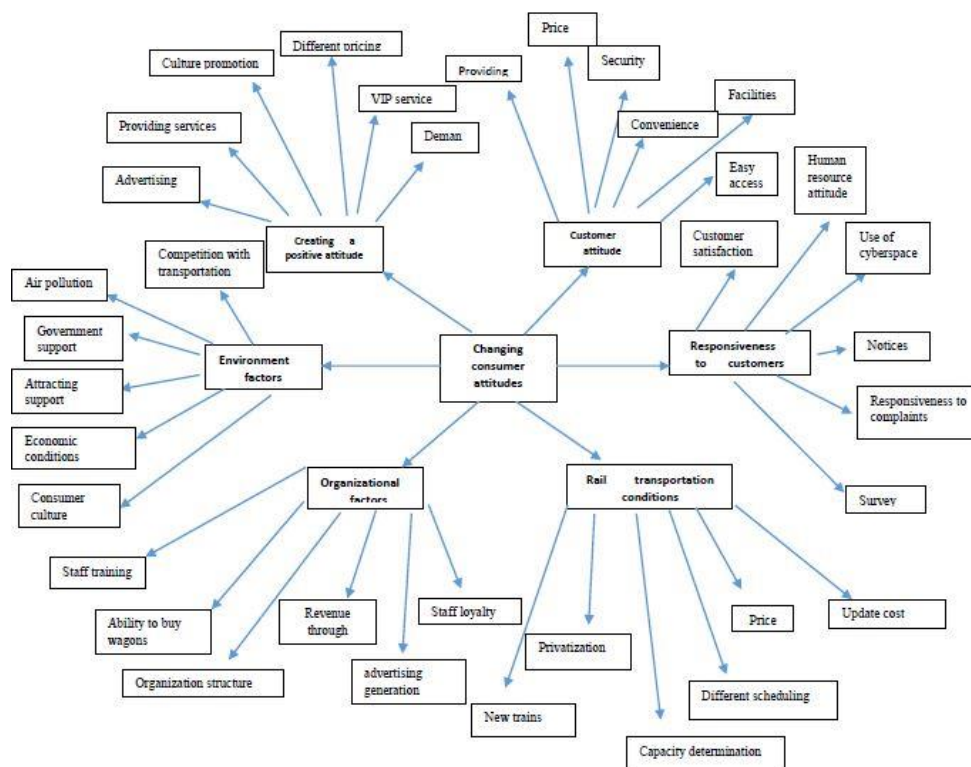


Figure 2. Maxqda output

Theme analysis ultimately yielded 6 inclusive themes along with 36 organizing ones. Figure 3 shows the theoretical model of the study.

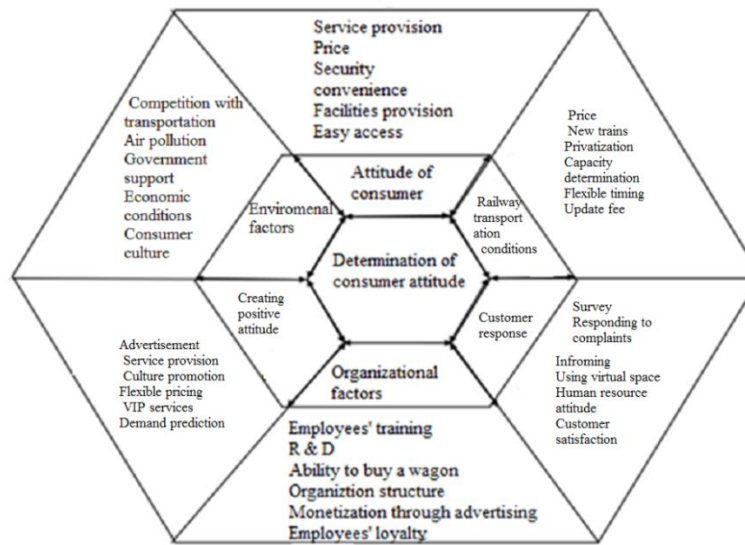


Figure 3. A theoretical model of the study

The interpretive structural model analyzes the relationship between the indicators by analyzing the indicators at several different levels. The interpretive structural model can be used to analyze the relationship between multivariate variables defined for a problem.

Table 2. Identification of the first level in the ISM hierarchy

Symbol	Input	Output	Subscription	Level
C1	C01,C02,C03,C04,C05,C06	C01	C01	4
C2	C02,C04,C06	C01,C02,C03,C04,C05	C02,C04	2
C3	C02,C03,C04,C05,C06	C01,C03,C05	C03,C05	3
C4	C02,04,C06	C01,C02,C03,C04,C05,C06	C02,C04	2
C5	C02,C03,C04,C05,C06	C01,C03,C05	C03,C05	3
C6	C06	C01,C02,C03,C04,C05,C06	C06	1

Figure 4 shows the final pattern of identified theme levels. In this diagram, only the meaningful relationships of the elements of each level with those of the lower level as well as the meaningful internal relationships of the elements of each row are considered.

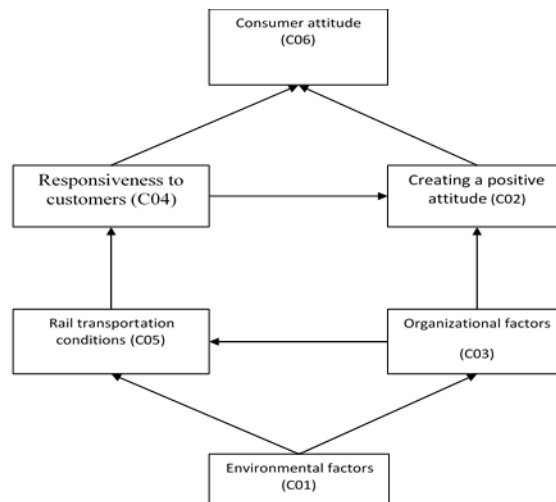


Figure 4. The basic model developed by ISM

In the (ISM)¹ model, the mutual and influential relationships between the themes and the connection of the themes of different levels are well shown, which leads to a better understanding of the decision-making environment by managers. For determining the key criteria, the power of influence and dependence of the criteria are formed in the final access matrix. The diagram of the strength of dependence for the themes studied by the MICMAC² software is shown in the figure below.

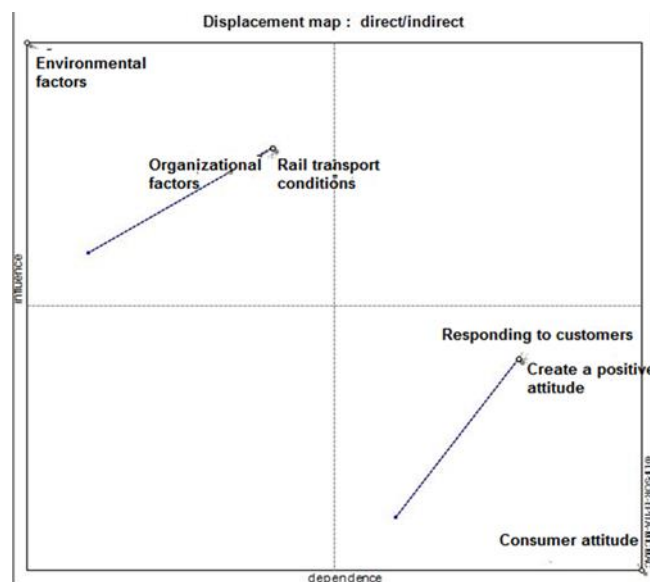


Figure 5. Penetration power and degree of dependence (MICMAC output).

Based on the strength of dependence and influence of variables, it is possible to define a coordinate system and divide it into four equal parts of autonomous variables (low degree of dependence and leadership power), independent (low dependence and high leadership), dependent (strong dependence and weak leadership), and linked (low dependence and low direction). The analysis of the mentioned variables is presented in the research findings section.

Structural equation modeling, namely Partial Least Squares (PLS) method, has been used to test the measurement model and research hypotheses.

5.1 Evaluating the external model

For evaluating the validity and reliability of measurement models in partial least squares structural equations, Cronbach's alpha, composite reliability (CR), convergent validity (AVE), and divergent validity (Fornell Larcker) were calculated. According to the results, Cronbach's alpha of all variables was greater than 0.7, so the reliability of all variables was confirmed. The value of average variance extracted (AVE) was greater than 0.5, so the convergent validity of the variables is confirmed as well. Further, the value of composite reliability (CR) is greater than AVE and equals 0.7, and each of the constructs of the model had good validity and reliability. Furthermore, the homogeneity reliability coefficient (Rho) was higher than 0.7.

Table 3. Convergent validity and reliability of research theme

Overarching themes	Cronbach's alpha	AVE	CR	Rho
Environmental factors	0.726	0.563	0.816	0.73
Create a positive attitude	0.722	0.519	0.853	0.761
Organizational factors	0.738	0.534	0.74	0.793
Responding to customers	0.764	0.538	0.755	0.754
Conditions of rail transport	0.865	0.53	0.801	0.765
Consumer attitude	0.79	0.566	0.852	0.814

1. Interpretive Structural Modelling

2. Matrix of Crossed Impact Multiplications Applied to a Classification

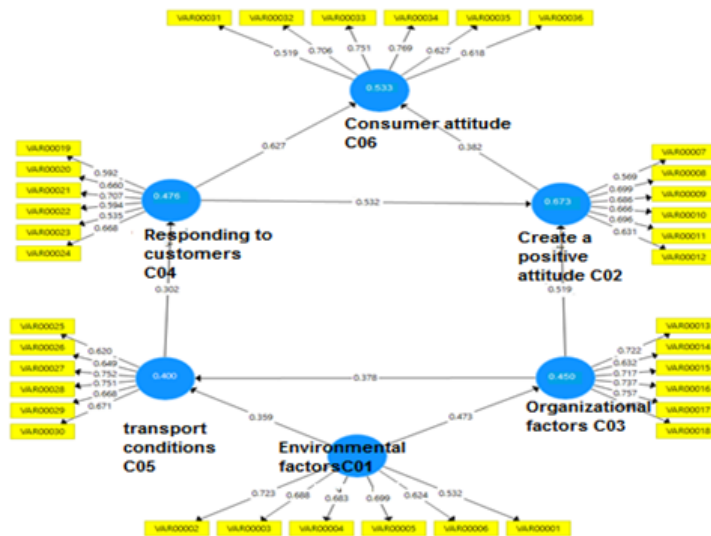


Figure 6. Factor loading of the research model (external model)

To confirm the fit of the structural model, the R^2 criterion, the F^2 effect size criterion, and the Q^2 criterion were used. Based on the results, the coefficient determination (R^2) of the endogenous constructs of the research model was desirable. The coefficient determination of dependent components showed that 48% of the changes in model variables are from the total effects of independent and dependent variables. Based on the results, the GOF was 0.0561 indicating the approval of the model. The value obtained from the Q^2 criterion, which shows the predictive power of the model for endogenous constructs, was all above 0.50, and it indicated that the predictive power of the research constructs is strongly estimated.

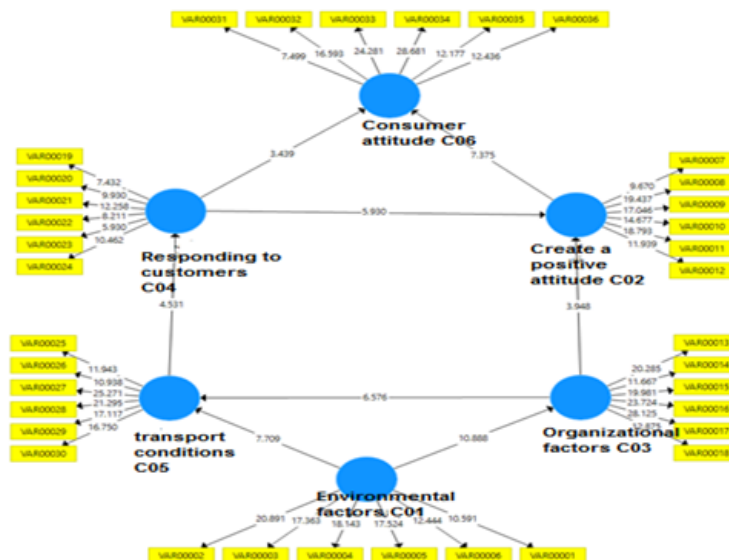


Figure 7. Bootstrapping T-statistics of the research model (external model of the research)

5.2 Descriptive statistics of research variables

To describe the research variables, descriptive statistics including mean, standard deviation, variance, skewness, and kurtosis were used. Further, for inferential analysis of data, confirmatory factor analysis and then structural equation modeling (SEM)¹ were used. Based on the results of the Kolmogorov-Smirnov test, a significant value greater than 0.05 was obtained for all variables. Therefore, the data distribution is normal. Considering the normality of research variables, Pearson's correlation test was used, the results of which showed a positive relationship between the identified variables. The

1. Structural Equation Model

correlation analysis manifested the highest correlation between organizational factors and railway transportation conditions (0.540).

5.3 Testing research hypothesis

Research hypotheses are as follows:

Hypothesis 1: Environmental factors affect organizational factors and conditions of railway transportation.

Hypothesis 2: Organizational factors affect railway transportation conditions and create a positive attitude.

Hypothesis 3: Railway transportation conditions affect customer responsiveness.

Hypothesis 4: Customer responsiveness affects creating a positive attitude and consumer attitude.

Hypothesis 5: Creating a positive attitude affects the consumer's attitude.

Table 4. Testing research hypotheses and path analysis of the model

No.	Hypothesis		Path coefficient	T-statics	Significance level	Status
1	Environmental factors	Organizational factors	0.473	10.888	0	Confirmed
2		Rail transportation conditions	0.395	7.709	0	Confirmed
3	Organizational factors	Rail transportation conditions	0.378	6.576	0	Confirmed
4		Creating a positive attitude	0.519	3.948	0	Confirmed
5	Rail transportation conditions	Responsiveness to customers	0.302	4.531	0	Confirmed
6	Responsiveness to customers	Creating a positive attitude	0.532	5.93	0	Confirmed
7		Consumer attitude	0.672	3.439	0	Confirmed
8	Creating a positive attitude	Consumer attitude	0.382	7.375	0	Confirmed

Structural equation model analysis revealed that the path coefficient of all paths is obtained from 0.3. The significance level in all hypotheses is less than 0.05 ($P = 0.000$). Therefore, with a confidence of 0.95, it can be said that all hypotheses are confirmed.

6. Comparison of research findings with previous research

The theme of organizational factors is in line with the study of Yousefi et al. (2013) titled "Factors affecting organizational silence, obstacles to creating organizational entrepreneurship" and that of Mazzei et al. (2014) titled "Technical and economic evaluation of the development of public high-speed railway transportation with the approach of an economic index of sustainable transportation".

The theme of environmental factors in this research is in line with Ebrahimpour' (2016) study titled "The role of railway transportation in the economic development of cities" and with Ebrahimpour (2016), titled "The inherent characteristics of railway transportation".

The theme of creating a positive attitude is in line with Gaskari's et al. (2004) study titled "Estimating the demand function of railway transportation in Iran" and Niko et al. (2011) research titled "Analysis of the relationship between the share of railway transportation and the rate of

accidents and fatalities in road transportation". The consumer attitude theme is the same in articles titled "Evaluation of an integrated model of factors affecting consumers' attitude towards online shopping" by Jorshari et al. (2017) and "Future study of the financing of the rail transport infrastructure plan" by Afsharpour (2014).

The theme of railway transportation conditions is in line with the articles "Institutional mapping of innovation in the railway transportation industry" by Elyasi et al. (2018) and "Investigating the role of regional and international markets in absorbing the country's road transportation" by Ardebili et al. (2014).

The theme of customer responsiveness is in line with Ismailpour's et al. (2016) study titled "Investigating the effect of using famous endorsers in advertisements on consumers' attitudes towards advertising" and with Haydari's et al. (2016) study titled "Cognitive dissonance: the effect of self-involvement on attitude change in different paradigms".

The results of this research suggest the dependence on inclusive themes including customer responsiveness, creating a positive attitude, and consumer attitude to change the attitude of consumers of the railway transportation industry. In addition, inclusive themes of environmental factors, organizational factors, and railway transportation conditions are the most effective factors in changing the consumer's attitude.

7. Research findings

The results obtained from the output of interpretative structural modeling through MICMAC¹ software showed the penetration power and the degree of dependence. It means that there were no independent and linked variables between the obtained themes, and only dependent and independent variables were yielded, which were analyzed as follows.

Dependent variables have a high dependency and low directivity. These variables generally are highly affected by the system and have little influence on it. In this research, the inclusive theme of customer responsiveness includes the themes of organizing surveys, responding to complaints, customer satisfaction, using virtual space, changing the attitude of human resources, and informing. Furthermore, the theme of creating a positive attitude includes the themes of organizing flexible pricing, providing appropriate services, and improving culture, advertisements, demand prediction, and VIP services. Finally, the inclusive theme of consumer attitude consists of the themes of price organizer, easy access, comfort, providing facilities, providing services, and security of the dependent variables of this research.

Independent variables have a low dependency and high directivity, in other words, they are highly influential and less affected. The inclusive theme of environmental factors include the themes of organizing government support, competition with other transportation, cultural conditions of consumers, helping the environment, attracting support, and economic conditions. The inclusive theme of organizational factors is made up of the themes of organizing organization structure, research and planning, training employees, monetizing through advertising, employee loyalty, and the inability to buy wagons. The inclusive theme of railway transportation conditions including the organizing themes of privatization, price increase, update costs, providing new trains, flexible scheduling, and determining the use capacity are the most influential.

The above themes were leveled by SEM (Figure no.) and then their relationships were tested through the designed hypotheses of structural equations and with PLS software, and the relationships of all themes in the model were confirmed.

8. Implications and managerial insights of the research

Based on the research results, it is suggested to the managers of the transportation industry to give environmental monitoring priority because environmental factors at the most basic level in the present analysis are the foundation for other factors affecting the change of consumer attitudes in the railway transportation industry. Factors such as the movements of competitors, changing tastes and customer expectations, and government laws and regulations governing this industry are among the most important environmental factors. On the other hand, people as customers and consumers of the

1. Matrix of Crossed Impact Multiplications Applied to a Classification

services of this industry now play the determining role. It is possible to choose more people in the current situation and managers should put customer responsiveness at the top of all their activities so that they can promote the railway transportation business by creating a positive attitude in them. From this perspective, managers can use high-access systems and channels to receive customer reports and complaints. Responding quickly to customer requests and handling customer complaints are critical. In addition, it is necessary to use responsive, knowledgeable, and patient employees and adjust the reward and punishment system for employees based on customer responsiveness. By responding to customers and meeting their needs and desires, a positive attitude can be created in them. Such a change in attitude will not only lead to more use of railway transportation services but will also increase the number of contacts and clients through positive word-of-mouth marketing.

9. Conclusion

For achieving economic development, diverse sectors are essential. In terms of economic development through railway transportation, the process involves mechanisms that can be harnessed by augmenting demand levels and escalating investments for infrastructure enhancement. Given that the railway transportation industry holds a pivotal role among individuals and the workforce within society and operates under distinct competitive circumstances, it becomes imperative to enhance the standing of the railway transportation sector. This, in turn, necessitates prioritizing it for industrial development and fostering competition with more developed nations. The outcomes of this study yield cost reduction and adaptable scheduling. There is also the potential for continual expansion and assessment through surveys, with information dissemination facilitated by means of social networks. Before introducing novel services in this industry, managers and the research and development team should meticulously evaluate the desirability of various dimensions within consumers' mental perceptions. This evaluation aids in selecting the most suitable strategy to provide optimal services. Furthermore, the services should be rendered in a manner that crafts a positive perception within individuals' minds, thereby influencing their attitudes towards utilizing railway transportation services.

10. Suggestions for future research

Centered on the "customer responsiveness" theme, a recommendation is made for the national railway transportation organization to construct a survey and implement an information dissemination approach through social networks, subsequently subjecting it to ongoing evaluation. This iterative process could be carried out via social networks, offering avenues for submitting suggestions and grievances within virtual spaces.

Drawing from the "organizational factors" theme, it is advisable to assess the degree of employee loyalty to the railway transportation organization and its associated dimensions. As the organization's performance is intertwined with that of its workforce, this evaluation can potentially influence consumer attitudes.

Within the context of "creating a positive attitude," a proposal is advanced that prior to introducing novel services in this sector, managers and research and development groups should meticulously scrutinize various facets of consumers' mental perceptions. This in-depth examination can guide the formulation of an effective strategy for service provision.

From the perspective of "Advertisement," an endorsement is made to scrutinize all advertising modes to alter consumer attitudes. This evaluation can assist in identifying the optimal advertising method capable of steering customer behavior transformation.

Addressing the theme of "railway transportation conditions," the establishment of a system for soliciting innovative ideas from customers during their journeys is suggested. This avenue empowers passengers to contribute their insights toward service enhancement. This proactive measure encourages individuals to voice the sources of their cognitive conflicts, facilitating the desired attitude change.

Derived from the "consumer attitude" theme, the proposal is to devise special conditions during periods of lower customer volume or for services with higher costs. This strategic approach aims to stimulate usage through tailored incentives.

Lastly, it is advocated that the organization enhance social values by offering specialized services. This endeavor nurtures a more positive sentiment among individuals and consequently facilitates attitude change. This elevation of perceived value ultimately fosters customer loyalty. Correspondingly, it is advised to assess and pinpoint dimensions related to "customer comfort" and identify any aspects potentially causing cognitive dissonance from their standpoint. Strategies can then be devised for effectively promoting a positive consumer attitude while mitigating cognitive dissonance.

11. Limitations and future suggestions of the research

The biggest limitation of this research is its cross-sectional implementation and its adaptability in the railway transportation service industry. Further, it should be mentioned that there was no similar work in the field of railway transportation with the approach of cognitive dissonance.

It is suggested that to change the attitude of transportation consumers towards railway transportation, things like the effect of ethnic culture in different cities on the way of providing railway services, the satisfaction of different customers in terms of background variables related to the provision of railway services and various marketing methods to be evaluated in line with the development of service sales in the railway transportation industry. Without exaggeration, railway transportation is the core of transportation systems and methods in the world's leading countries. Apart from the many economic and social benefits, the importance of this is to the extent that it is used as an indicator to determine the level of development of a country. In our country, due to the increasing growth of urbanization and economic and environmental concerns and meeting the needs of society, in recent years, special attention has been paid to safe, fast, and efficient transportation and the development of railway transportation (Elyasi,2019).

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