

RESEARCH ARTICLE

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Designing a Structural Model Based Using Smart Technologies in Improving the Ethics and Administrative Health of Customs Employees

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Abstract

In this research, in line with the strategy of the World Customs Organization, in order to provide a structural model for improving the ethics and administrative health of employees based on the use of information technology in customs affairs with a combined approach of fundamental theory and interpretive structural modeling to understand how information technology affects ethics and Administrative health and investigating the power of influence and the degree of dependence of the variables of ethics and administrative health of employees in the form of drawing a comprehensive structuring model. In the implementation of this research, a mixed method was used in the qualitative part of the foundation's data theory according to the research needs and structured interviews were used to collect data. The statistical population of this research, according to its subject area, includes managers, experts and customs employees who have mastered the subject. The purposeful sampling method was used in the sample selection. The research tool was an interview that continued until data saturation. The validity and reliability of the interview was carried out according to the acceptability criteria and 5 of the 10 criteria of acceptability for qualitative tools were observed in this research, which included the sensitivity of the researcher, the coherence of the methodology, fitting the sample, repetition of a finding, and the use of feedback from informants. To collect data in a qualitative method, with the help of Maxqda software, research findings through the opinions of 13 experts in three stages of open-centered and selective coding in the form of 6 categories affecting the ethics and administrative health of employees in the form of the Strauss paradigm model and Corbin and it was expressed theoretically. After building the theory, in the quantitative stage, interpretive structural modeling has been used in order to understand the relationship between the variables and the leveling of the promotion of ethics and administrative health of Iran Customs. The results of the research show that the variable "use of smart technologies" is the first level variable in the promotion of ethics and health, and the variables "Analysis of the situation of manpower and customs processes, ethical characteristics of employees and laws and management of information technology and human resources" » is the second level variable. And the variables of "conditions and structure of the organization and the requirements and infrastructure of information technology" are the variables of the third level. This means that the customs organization should first consider the key variables extracted in the research based on the priority of the levels because the resources of the organization are limited, secondly, it is better for the customs to improve ethics based on the results of the research. and the administrative health of the employees should act on the deployment of advanced blockchain and artificial intelligence technologies in Kamerg so that we can witness an increase in integrity and a decrease in product sedimentation and as a result an increase in customs revenues.

Keywords: *New technologies, Interpretive Structure model, Grounded theory, Administrative ethics, Customs*

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Introduction

The customs position of the Islamic Republic of Iran with more than 8000 personnel and also a considerable income situation (the third source of income in the country) increases the potential of studying and examining the issue of administrative health, followed by examining how information technology affects office health. It is of special importance (Ebrahimi et al., 2021; Bagherzadeh et al., 2019). Another important factor in this regard is the membership of the Customs of the Islamic Republic of Iran in the World Customs Organization. The World Customs Organization has declared the promotion of the health of the administrative system as one of its basic pillars, and accordingly approved the Arusha Declaration on July 7, 1993, according to which it obliges all its members to improve the health of the administrative system (Etemadian & Parhizgar 2020; Also Salajeghe & Sayebani, 2020). According to this declaration, as well as the negotiations with the World Customs Organization, countries are required to implement the necessary methods to promote administrative health and also to share it with other countries (Ashrafi et al., 2020). It is obvious that presenting a report on how information technology affects the administrative health will have beneficial consequences for the country's customs (Homayouni et al., 2021). Therefore, considering the basic issue in the field of remaining unknown how information technology affects office health and also the importance and necessity of recognizing this important, conducting and conducting this research is a need. On the other hand, a linear and one-way view of the relationship between variables is something that will cause many problems. Just paying attention to a simple relationship between the dependent and independent variables makes the facts and facts somewhat unknown (Rahchamani et al., 2022). In other words, in the field of relationship between variables, a relationship may directly have a positive effect on the dependent independent variable, while indirect and internal relationships between

independent variables may ultimately lead to other results (Moosavi Rashedi et al., 2021). Therefore, reaching a general conclusion about the linear relationships of dependent independent variables somewhat keeps the results obtained from reality. The problem and deficiency expressed in this section is clearly evident in the results of most research in the field of office health (Zhang et al, 2021; Oakman et al., 2020; Gorgenyi et al, 2021).

Also, administrative and financial corruption has become a global problem and governments know that corruption causes many economic damages. As its results and consequences are different depending on the type of political economic organization and the level of development, in any case, corruption has caused degeneration, puts government policies in conflict with the interests of the majority, and causes waste of government resources and people's trust in government institutions. Becomes (Karimikia & Mohammadi, 2013). On the other hand, if not all, but most of the customs functions are prone to corruption, the necessary measures should be taken to prevent corruption and improve the ethics and administrative health of the employees in the customs. In line with the importance of ethics and administrative health and the variables affecting the promotion of ethics and administrative health of employees, one of the tools that can help in this process is the use of systems and information technology to provide services to customs receivers. It can provide a platform for this important by reducing the level of relationships between employees and clients (Abesadze & Daushvili, 2016).

For this reason, in this research, it has been tried to identify the effective and key variables affecting the ethics and administrative health of employees and the role of information technology in improving the level of ethics and health of employees by using interpretive structural modeling in order to identify the relationships between the elements of the structural model of improving ethics and To pay attention to the administrative health of employees based on

the use of information technology in customs, while the main issue of improving the ethics and administrative health of employees is to use the latest technologies recommended by the World Customs Organization in order to reduce economic damage, environmental advantage to the society and increase the customs revenue of the countries. Is a member, and at the same time, it will lead to the satisfaction of service recipients and customs employees.

Literature Review

-Lindert et al (2022) in research with title: "Organizational Health Literacy in the Context of Employee Health: An Expert-Panel-Guided Scoping Review Protocol" argued that the scoping review will critically discuss whether a new definition of OHL in the context of employee health is of purpose for future research and practice. Nonetheless, it will provide orientation in the context of employee health, also facing the consequences of SARS-CoV-2.

-Singh & Jha (2022) in an article with title: "Relationship between employee well-being and organizational health: symbiotic or independent?" try to describe that the bi-directional causal relationship (regular and reverse causation) between employee well-being and organizational health, which is grounded in the micro-foundations of institutional theory.

-Koinig & Diehl (2021) in an article with title: "Healthy Leadership and Workplace Health Promotion as a Pre-Requisite for Organizational Health" argued that companies are still more likely to delegate responsibility for employee health and well-being to their staff, having not fully realized the potential of healthy leadership and organizational health promotion. There is great potential to increase WPHP measures on the employer side, through both healthy leadership and supporting WPHP measures.

-Nazari Faorkhi et al., (2020). in an article with title: "Designing an Intelligence Model for Auditing Professional Ethics in Knowledge Contents Production" argued that the use of structural and semantic analysis

methods in sequence can lead to the prevention of repetitive content. This is heavily needed in order to achieve a systematic ethical responsibility.

-Sudiro & Rahayu (2020) has been conducted on the topic of the relationship between spiritual values at work, educational trends, human resources activities and organizational health. The purpose of this research is to provide a strong analysis on the relationship between the above three factors. The results obtained from 139 branch managers in the financial sector of Indonesia through a questionnaire indicate that spiritual values in the work environment have a greater impact than other variables in increasing organizational health.

-Ghobadi & Tabbodi (2019). In an article with title: "The Causal Model of Corporate Identity, Security Leadership, and Work Ethics" concluded that descriptive and inference statistical variable are used in data analysis: frequency, percentage, mean, standard deviation in descriptive statistics and Pearson correlation coefficient in statistical inference. The results show the significant effect of corporate identity and security leadership on the work ethics. The corporate identity, security leadership and works ethics have the significant effect on their own components, as well. The overall results indicate that the corporate identity and security leadership affect the works ethics.

-Nair's research (2019) has been conducted on the issue of the impact of technology distribution on organizational health. In this research, competition and innovation capacity have been used as mediating variables. The results of this research have created new ways to manage human resources in order to develop competition in new industrial technologies. The results show that innovation capacity as a moderating factor in companies' technology can lead to organizational health.

-Korani & Rashidi (2018) in their research on the topic of examining the effect of organizational intelligence on promoting organizational health, reached the conclusion that there is a correlation between

organizational intelligence and organizational health, and this indicates that organizational intelligence has an effect on organizational health. It has meaning. Also, the results of measuring the impact of organizational intelligence components, including strategic vision, common destiny, desire to change, unity and agreement, morale, application of knowledge and performance pressure, on organizational health showed that due to the positive existence coefficient, a meaningful effect on organizational health can be achieved. Therefore, there is a significant relationship between organizational intelligence and its components with organizational health.

-Jalili et al., (2018) in their research investigated the issue of regression analysis of organizational health and job satisfaction with burnout of physical education teachers in Tehran province. The results of the research showed that there is a negative and significant relationship between organizational health and job burnout of physical education teachers, and there is a positive and significant relationship between organizational health and job satisfaction of physical education teachers. There is a significant inverse relationship between job satisfaction and burnout of physical education teachers.

-Amrollahi et al., (2017) have investigated the issue of analyzing the effects of organizational justice on organizational health with emphasis on the mediating role of social capital. The statistical population of the research was the employees of public libraries in Yazd province. The results of this research show that "organizational justice" and its components have a significant impact on organizational health, and among the existing components, the "relational justice" component has the greatest impact on organizational health.

-Mohammadzadeh et al., (2017) have examined the relationship between organizational agility and organizational health. The statistical population was all hospital employees of Shahid Beheshti University of Medical Sciences and the

results show that there is a positive and significant relationship between organizational agility and organizational health.

-Korkmaz (2017) in a research entitled the impact of leadership style on organizational health, has examined the impact of two transformational and operational leadership styles on organizational health. This research was done through the distribution of a questionnaire among the statistical population of teachers in Turkey and the results show that transformational leadership has a greater effect on employee satisfaction as an indicator of organizational health, while operational leadership directly this does not matter.

-The researches of Mohajeran et al., (2017) were conducted with the topic of examining the relationship between organizational trust, organizational health and entrepreneurship of the employees of the health center of Hamadan city. This research, according to the review of the many works done regarding trust, health and organizational entrepreneurship, and at the same time there is a vacuum regarding the simultaneous examination of the relationship between these three important organizational variables and with the aim of explaining the relationship between organizational trust, organizational health and employee entrepreneurship done. The results obtained from the research showed that there was a significant positive relationship between the variable of organizational trust and organizational health, as well as between two variables of organizational health and entrepreneurship, but no significant relationship was found between organizational trust and entrepreneurship.

Comparative studies of customs of successful countries in using new technologies

Comparative study of UAE customs based on blockchain technology

1. UAE Customs.

The platform is set to turn Dubai into a world-class e-commerce hub and attract more foreign direct investment to Dubai. Among

other benefits, this platform for customs includes:

- Increase productivity and reduce administrative irregularities by optimizing information sharing and transparency;
- Integration and facilitation of clearance;
- Provide 100% visibility and tracking in e-commerce transactions for all stakeholders;
- Control the return of goods by connecting merchant and customs systems;
- Improving flexibility for e-commerce companies;
- Reduce the provision of physical documents for import to the mainland from the entry borders;
- Provide toll exemptions and reduce service costs (Al Olama, 2021).

This platform can be used for companies involved in the import and export of goods throughout Dubai.

Blockchain technology has been used to build IT platforms and systems. Using this technology, e-commerce companies and logistics providers will be able to connect to the operating system. When an e-commerce order is placed online, the data is transferred directly to the operating system, which automatically generates a customs declaration. Not only will Customs be fully aware of the movement of goods from the origin to the final consumer, but it will also be able to increase its executive capacity to review and save time for approval of declarations and request automatic exemption after the return of goods and increase integrity at customs. This blockchain will be the basis of a larger customs blockchain in the future that will enable its activation (Bishr, 2020).

2. Hong Kong Customs

Since March 2018, Procurement and Supply Chain Management has used blockchain technology to ensure the security of commercial products across Hong Kong through several channels, including retail and online distribution. Currently, the project has successfully used technology has incorporated blockchain into its range of anti-fraud certification products. Information

about products protected by LSCM AuthenvTick™ DSS Authenti Guard and other anti-counterfeiting and third-party technologies is easily stored in the blockchain. This blockchain tracks all transactions and status changes that occur when shipping goods through the supply chain so that all stakeholders and systems can be informed of the location of the goods. And will minimize the possibility of supply chain disruption (Wang, 2022).

3. Chinese Customs

Customs sources are now focusing on how blockchain technology can secure customs in developing secure business chains by collecting and sharing data that includes all stages of production, processing, storage and internal and external use. And help efficiently (Rohani et al., 2020). They are also exploring virtual reality and the possibility of using it to train customs officers to fight corruption and manage ship inspections. China uses blockchain to clear border goods (Carnap, 2021). The Chinese government uses blockchain technology in many aspects of its cross-border trade. Among other new measures, blockchain further improves data integrity and transparency. This process has already been modernized with digital systems. By using this technology, the average export time has been reduced from 191 hours to 27 hours. Exports take place in just 2 hours (Rawat et al., 2021). The system, built by the Power Bridge, focuses on ports, and the Chinese government plans to store data on customs clearance, exchanges, taxes, shipping and payments in the blockchain. This improves the reliability of the information and, in turn, creates an efficient audit (Ekman, 2021).

4. Japanese Customs

Japan Customs has used artificial intelligence technology to further enhance and streamline customs operations. In addition, staff are trained in the use of artificial intelligence, and current customs operations are reviewed to improve the

overall work environment. To achieve this goal, the following measures are taken:

- Strengthen the inspection capabilities of customs officers by increasing the use of technology such as artificial intelligence, data mining, blockchain, IoT and drones;
- Promoting integrity in customs officers using blockchain technology;
- Improving the level of knowledge of customs staff so that they can use new technology more effectively;
- Improve post-discharge audits using artificial intelligence analysis (Yano, 2020).

Research Methodology

This research has been conducted with the aim of designing a structural model for improving the ethics and administrative health of employees based on the application of customs information technology with a combined approach of fundamental theory and interpretive structural modeling. The interview is of a structured type and the analysis method was analytical-structural. In addition, according to the purpose of the research, in terms of method, it is a descriptive-causal research that examines causal relationships and the effect of related variables. The statistical population of this

research is customs managers, members of customs violations board, professors of customs administration and key service recipients of customs. Which includes 13 experts in the customs field and have been selected by purposeful and judgmental sampling. In addition, the interviewees are people who have more than twenty years of work experience and have postgraduate and doctorate degrees. In order to achieve the desired goal, this research can be divided into two general parts:

- ✓ In the first part of the research, in order to identify the variables affecting the ethics and administrative health of the employees, it is intended to use the data theory of the foundation.
- ✓ In the second part, by applying interpretative structural modeling, the internal relationships between the variables surrounding the promotion of ethics and administrative health of employees were identified and the relationship map between the variables was designed. Finally, the key variables of improving the ethics and administrative health of customs employees have been structured using the interpretive structure model.

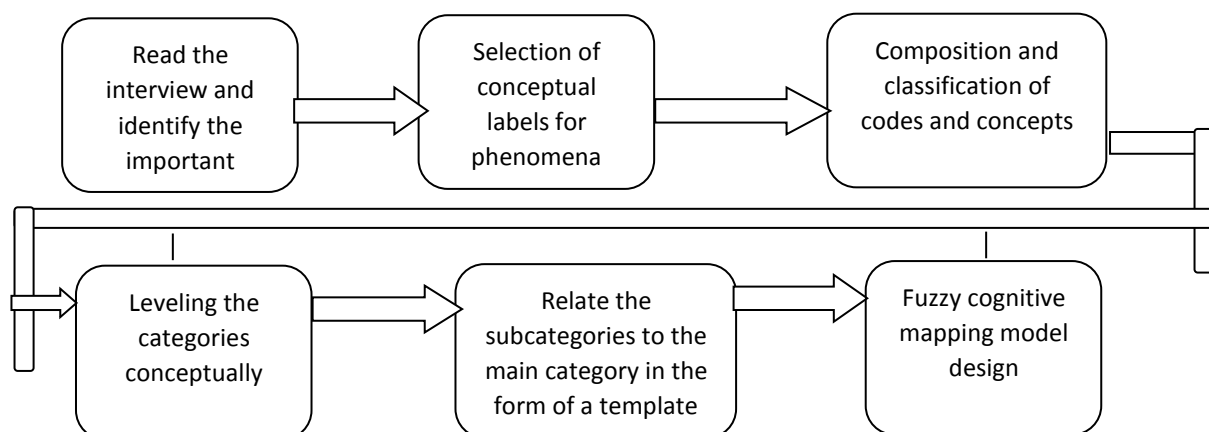


Figure 1. The process of performing and completing research data analysis

Findings

In the open coding stage, the conceptualization of data is the first step in the analysis. For this purpose, the interview data were carefully studied and with the opinion of customs managers and customs

officials, all the obtained criteria were used to determine the categories. From the qualitative analysis of the content of the interviews, 6 categories (main category) and 95 sub-categories were obtained. Then, the same data, which had the same semantic load,

were coded under common codes and appropriate concepts were assigned to each of them. This means that in this step,

subcategories were extracted, which are shown in the table below.

Table 1.

Initial coding (open)

Clearance of clearance procedures - Determining the route of work - Registration of activities - Registration and documentation - Registration and storage of documents - Identification of responsible for errors - Detection of financial errors - Compassionate information - Elimination of debt forgery - Reduction of customs license forgery - Reduction of forgery of door documents Exit - Reduction of forgery in valuation documents - Absence - Interference of taste - Reduction of interference in determining valuation - Reduction of interference in determining value - Reduction of the possibility of tampering - Reduction of probability of expertise - Intelligent selection of experts - Establishment of intelligent exit door - Monitoring goods Smart Expert - Electronic review - Online execution of declarations - Evaluation of formalities through the system - Systematic issuance of customs licenses - Electronic licensing Electronic licensing process - Systematization of value system - Systematization of crime determination - Systematic calculation of costs - Systematic audit system - Foreign trade database - Electronic receipt of salaries and duties - Electronic payment of debts - Electronic payment of fines - Electronic connection of bill of lading - Connection to the banking system - Connection to other organs and organizations - Elimination of physical contact between the appraiser and currency determinants Water - Prevent document change - Prevent collusion - Prevent document loss - Improve teamwork - Reduce conflict in team work - Determine the path to system sorting - Clear the path - Simplify activities - Simplify payment - Facilitate customs activities - Reduce expertise time - Increase work speed - Reduce declaration storage - Reduce interruptions - Eliminate paperwork - Reduce bureaucracy - Reduce the likelihood of false claims - Fear of customer error - Reduce business card misuse - Eliminate understatement and overstatement - Monitor Customer - Customer Information Registration - Customer Performance Review - Ease of Reporting Complaints - Follow-up of Complaints Without Taste - Category Complaints - Customer Submissions Monitoring staff performance - Tracking violations - Invisible control of employees - Increasing organizational justice - Accurate division of labor - Identifying activities - Reducing individual inconsistencies - Reducing organizational inconsistencies - Reducing error motivation - Reducing interference and possession in the bill of lading - Reducing valuation errors - Reducing bias - Cost calculation - Warehousing error reduction g Merck - Reduction of transit errors - Reduction of errors due to warehousing - Availability of information and statistics - Up-to-date control of inventory - Communication with neighboring organizations - Reduction of inter-organizational communication errors - Health of license approval - Reduction of corruption bottlenecks - Reduction of profitability - Reducing the power of infringement centers - Reducing the infringement of sailors and border guards - Fair distribution of declarations - Justice in valuation - Justice in reviewing declarations

Axial coding is the second stage of analysis in foundation data theorizing. The purpose of this step is to establish a relationship between the classes produced in the open coding step. The relationship of other classes to the central class can be realized in six headings: causal conditions, central phenomena, strategies and actions, intervening conditions, contextual

conditions and consequences (Strauss & Corbin, 1998).

Maxqda software output

Maxqda software version 2018 is used for coding and analyzing qualitative data. In this research, qualitative analysis of interviews was performed using this software and the data were extracted in a structured manner as described in Figure 2.

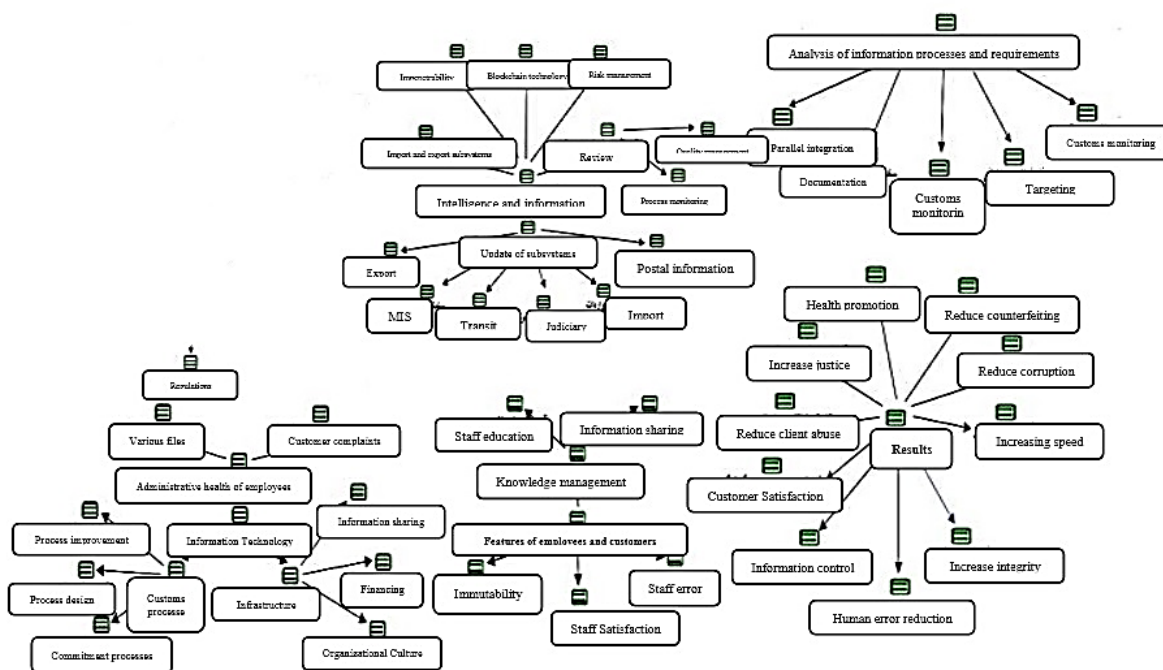


Figure 2. Maxqda software output

The following tables show the axial categories extracted by Maxqda software coding. The tables of the main and sub-reporting are presented.

Table 2. Main categories and sub-categories of research

Main Category	Sub-categories
Application of intelligent technologies	-Exchange of information with the customs of neighboring countries and the World Customs Organization -Impermeability - Exchange of information with neighboring customs organizations - Use the capacity of social networks - Customs system intelligence - Ability to track customs shipments - Using artificial intelligence - Internet of Things - Cloud processing - Virtualization - Intelligent risk management - Exchange of information - Information control - Use of blockchain technology
Information Technology Requirements and Infrastructure	-Renovation and updating of customs equipment -Creating a database of violations in order to implement Article 111 -The amount of budget allocated to technology infrastructure -Specialized staff training -Empowerment of customs technical experts -Integration of customs educational and specialized standards
Analysis of manpower status and customs processes	-Process documentation -Simplify processes -Number of customs processes -Number of violation cases -Number of corruption bottlenecks

Main Category	Sub-categories
Behavioral characteristics of employees and rules	<ul style="list-style-type: none"> -Foreign trade volume -Staff resistance -Transparency in information -Transparency of existing laws regarding human resources and information -Technology -Review of trade laws and regulations and customs procedures -High volume and sometimes contradictory directives and instructions issued for customs -Early changes in customs laws and tariffs -Staff error
Information Technology and Human Resources Management	<ul style="list-style-type: none"> -Increase office health -Innovation in Iranian customs -Use the customs experience of successful countries -Applying human resource strategies -Customer satisfaction -Delivery rate on time -employee satisfaction -Reduce corruption -Increase work speed
Conditions and structure of the organization	<ul style="list-style-type: none"> -Management commitment -Complexity -Focus -Organizational reform -Official

Selective Coding

In fundamental theorizing, data integration is of great importance. In the research process, after collecting data, analyzing and interpreting them, it is time to present the model, conclusion and summary of the research. While open coding divides data into different categories, axial coding links categories and their subcategories according to their characteristics and dimensions. A paradigm has been used in research to discover how categories relate to each other. The paradigm is the analytical tool proposed by Strauss and Corbin to study the data. The main components of the paradigm are: conditions, actions / reactions and consequences. Strauss-Korbin proposed the paradigm model in that in data-based data theory, subcategories are related to categories in the form of a set of relationships that represent causal conditions, phenomena, contexts, intervention conditions, action /

reaction strategies, and outcomes. Causal conditions are events or happenings that affect a phenomenon. A phenomenon is a major event or event that is governed by, or associated with, a set of actions and reactions. Interventional terms are broad and general terms that facilitate or reduce action / reaction strategies. Action / reaction strategies are purposeful and directional actions that solve the problem, manage the phenomenon and respond to it. Consequences are constructs that arise as a result of actions and reactions or responses to a phenomenon.

Categories of contextual conditions

Based on the results of secondary research coding, organizational status indicators (management commitment, focus, complexity) were selected as the underlying categories in providing a model to improve the administrative health of customs staff using information technology.

Table 3

Categories of Contextual conditions

Paradigm	Subcategory
Contextual conditions	-Organizational conditions (management commitment, focus, complexity)

Categories of Causal conditions

Based on the results of the secondary coding of the research, the indicators of Table 4 were selected as the categories of Causal

conditions in presenting a model to improve the administrative health of customs employees using information technology.

Table 4

Categories of Causal conditions

Paradigm	Subcategory
Causal conditions	IT structure and requirements-
	Administrative health status in customs-
	Number of corruption bottlenecks-
	Number of customs processes-
	-Multiple violation cases

Categories of Axial phenomena

Based on the results of the secondary coding of the research, the indicators of Table 5 were selected as the Central phenomena in

presenting a model to improve the administrative health of customs employees using information technology.

Table 5.

Categories of Axial phenomena

Paradigm	Subcategory
Axial phenomena	-Analysis of customs processes
	-Analysis of IT requirements and requirements
	-Analysis of administrative health status of employees
	-Exchange and control information
	-Process documentation

Categories of Strategies and actions

Based on the results of secondary research coding, indicators of information technology intelligence, information transparency,

process simplification as the categories of strategies in providing a model to improve the administrative health of customs staff using information technology were selected.

Table 6.

Categories of strategies

Paradigm	Subcategory
Strategies	-Information technology intelligence (intelligent risk management, blockchain, artificial intelligence)
	-Information transparency
	-Simplify processes

Categories of Intervening conditions

Based on the results of the secondary coding of the research, the indicators of staff resistance and staff error were selected as categories of intervening conditions in presenting a model to improve the administrative health of customs staff using information technology.

Table 7.

Categories of Intervening conditions

Paradigm	Subcategory
Intervening conditions	-Staff resistance
	-Staff error

Categories of Consequences

Based on the results of the secondary coding of the research, improving office health and increasing work speed and customer satisfaction were selected as categories of outcomes in providing a model to improve the office health of customs employees using information technology.

Table 8.

Categories of Consequences

Paradigm	Subcategory
Consequences	-Promote administrative health and reduce corruption
	-Increase the speed of work and satisfaction of customs customers

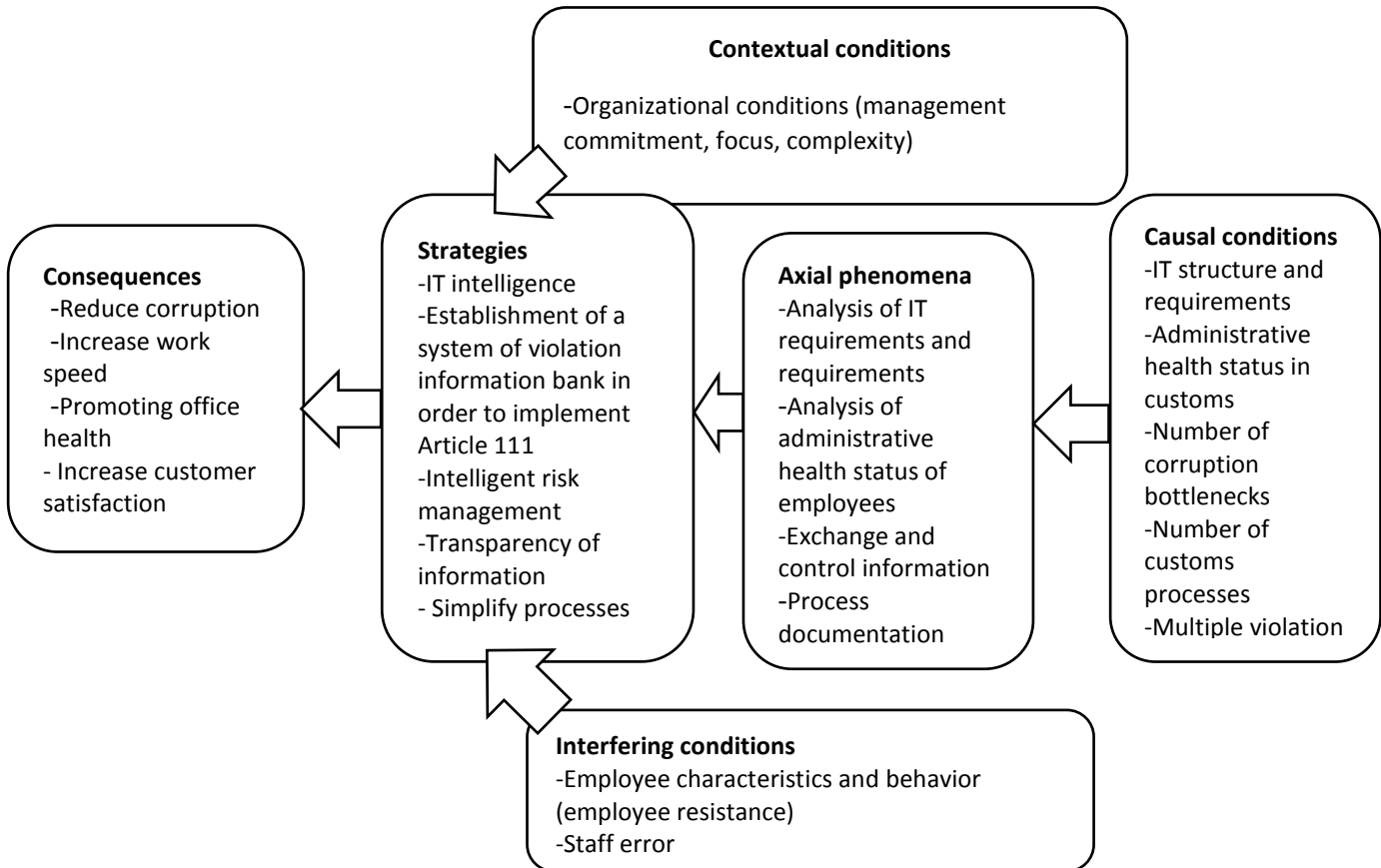


Figure 3. *The Structural Model Based Using Smart Technologies in Improving the Ethics and Administrative Health of Customs Employees*

The paradigm model of promoting the administrative health of customs employees recognizes that the customs should first take into account the causal conditions (infrastructure status and information technology requirements in terms of fiber, organizational budget, and how to connect the customs system with neighboring organizations involved in trade). Slowly Also, the current state of administrative health of employees (in terms of the amount of violations, the number of violation cases and the number of corruption bottlenecks)

should be considered and the root of the violation and analysis of customs processes in terms of analysis of corruption bottlenecks should be analyzed. Finding violations and analyzing and monitoring the customs processes of import, export and transit, which is the basis of the central phenomenon. Customs Organization) and intervening conditions in promoting administrative health, which is the degree of resistance of customs staff to changes in information technology, should be considered. , IoT and intelligent risk management strategy) to

increase the speed of customs clearance work, to reduce corruption and satisfaction of customs officers and improve the administrative health of employees.

Fuzzy Cognitive Mapping (FCM)

Fuzzy cognitive mapping has the ability to model weighted and complex causal relationships by defining the strength of the edges, so that the relationship between the two variables C_i and C_j is shown as W_{ij} . This

correlation power of relations is written as temporal variables in the interval $[1 +, 1-]$. According to graph theory, these relationships can be converted into an adjacency matrix in the form $E = [e_{ij}]$ to be used for analysis using mathematical techniques. The fuzzy cognitive mapping method consists of six steps, the steps of which are described in the following way.

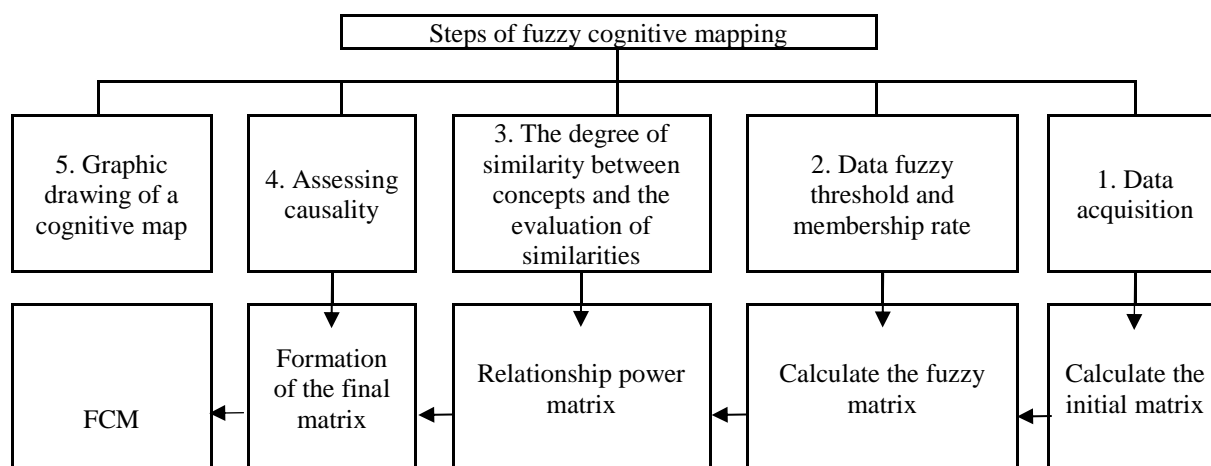


Figure 4. Fuzzy Cognitive Mapping (FCM) Steps

Step 1: Acquisition of data from experts: In order to extract the causal relationships between different concepts of the model, first a semi-structured interview process was designed and conducted based on a conceptual model extracted from the background of internal and external research

and interviews with thirteen customs experts. In these interviews, customs experts determined the causal relationships between the concepts in the interview process. The variables of key and influential variables in the administrative health of employees were extracted based on the table 9.

Table 9.

Variables of key and influential variables in the administrative health of employees

1. Multiplicity of customs processes	2. Violation cases	3. Forge documents	4. Number of bottlenecks of corruption	5. Management commitment	6. Complexity
7. Focus	8. Staff resistance	9. Staff error	10. Work speed	11. employee satisfaction	12. Information technology smartening
13. Office Health	14. Corruption	15. Staff knowledge	16. Simplification	17. Exchange of information	18. Transparency
19. Documentation	20. Permeability	21. Information control	22. Customer satisfaction		

Step 2: Calculate the initial matrix: The initial matrix is an $n \times m$ matrix, which in the present study is considered to be 22×13 matrix. In this matrix, n shows the number of indicators or variables, in other words, the

factors affecting the promotion of administrative health (22 final variables) and m the number of customs experts (13 experts) who have been interviewed in order to collect information. Each of the O_{ij} elements of this

matrix indicates the degree of importance that each person / i considers for each index or variable. The values in this table are then changed to the values of a fuzzy set with values of 0 and 1. The elements O_{i1} , O_{i2} , O_{im} are vector elements V_i .

Step 3: Calculate the fuzzy matrix: The numerical vectors V_i are changed to fuzzy sets, where each fuzzy set represents the degree of membership of the element O_{ij} from the vector V_j to the vector V_i itself. Numerical vectors with zero value are converted to fuzzy sets as follows. Find the maximum value in V_i and $X_i = 1$ is considered for it, ie: $(\text{MIN}(Q_{ip}) \rightarrow X(Q_{ip})=1)$

Find the maximum value in V_i and consider $X_i = 0$ for it, ie: $(\text{MIN}(Q_{ip}) \rightarrow X(Q_{ip}) = 1)$ All other elements are specified for the vector X_i in the range of zero and one, namely:

$$\text{Relationship 1: } X_i(Q_{ij}) = \frac{Q_{ij} - \text{MIN}(Q_{ip})}{\text{MAX}(Q_{ip}) - \text{MIN}(Q_{ip})}$$

In the present study, in order to prevent bias by the customs experts, the answers of the lower limit of 20 and the upper limit of 90 are considered for the answers. However, all the answers that included scores equal to or below 20 are equal to zero were taken and all responses equal to or greater than 90 times were counted.

Step 4: Relationship power matrix: The relational power matrix is an $n \times n$ matrix (in this study 22×22). The rows and columns of this matrix represent the concepts or variables, ie the factors affecting the promotion of administrative health of employees in customs, and each of the elements indicated by v_{ij} in this matrix represents the relationship between the i variable and the j variable. Each element of this matrix, ie the v_{ijs} , can take values in the range [1 and -1].

If $v_{ij} > 0$, the causal relationship between the concepts i and j is direct (positive); In other words, an increase in the value of concept i causes an increase in the value of concept j , and a decrease in the value of concept i leads to a decrease in the value of concept j . If $v_{ij} < 0$, the causal relationship between the concepts i and j is inverse (negative); That is, an increase in the value of concept i causes a decrease in the value of concept j , and an increase in the value of concept i causes a decrease in the value of concept j . Finally, if $v_{ij} = 0$, it means that there is no causal relationship between the concepts of i and j . For vectors that are directly related to each other and vectors that are inversely related, the distance (d_{ij}) between element i of the vectors v_1 and v_2 are calculated through equations 4 and 5, respectively:

$$\text{Relationship 2: } d_{ij} = |X_1(V_j) - X_2(V_j)|$$

$$\text{Relationship 3: } d_{ij} = X_1(V_j) - X_2(V_j)$$

The average distance between vectors V_1 and

$$v_2 \text{ is: } AD = \frac{\sum_{j=1}^m |d_{ij}|}{m}$$

Proximity or similarity between two vectors is also calculated by Equation 4:

$$\text{Relationship 3: } S = 1 - AD$$

In direct relation vectors, if the degree of similarity between the two concepts is equal to 1 ($S = 1$), it indicates the highest similarity, and if the degree of similarity between the two concepts is zero ($S = 0$), it indicates the lowest degree of similarity.

Step 5: Format the final fuzzy cognitive matrix: Once the relationship power matrix is complete, some of the data in it is useless and misleading. Not all the relationships shown in the matrix are always established, and there is not always a causal relationship between all the variables. Thus, with the help of experts, the data was analyzed and the power matrix of relationships became the final matrix.

Table 10.

Final cognitive matrix of staff ethics and health administrative office

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Multiplication of customs processes (1)			0.10						-0.30						0.45			0.70				
Violation cases (2)										0.25												
Multiple corruption bottlenecks(3)	0.35	0.65																0.70				
Management commitment(4)							0.20				0.85	0.75	0.60									
Complexity(5)						0.45				-0.25					-0.35							
Focus(6)					0.45																	
Staff resistance(7)										0.20												
Staff error(8)															0.50							
Work speed(9)																						0.50
Employee satisfaction(10)																	0.20	0.20			0.25	
IT intelligence(11)							0.20		-0.20				-0.40				0.20		-0.20	0.20		0.20
Office Health(12)													-0.90									
Corruption(13)																						
Staff knowledge(14)							0.70			0.30					0.25							0.30
Simplification(15)	0.15			0.30					0.57	0.25									0.20			0.32
Exchange of information(16)										0.35											0.40	
Transparency(17)										0.60	0.50		0.20									
Documentation(18)															0.75							
Impermeability(19)											0.45										0.45	
Information control(20)											0.45					0.40						
forging documents(21)												-0.65										
Customer Satisfaction(22)										0.50							0.10					

Step 6: Fuzzy Cognitive Map Visualization: The final matrix graphical representation will lead to the creation of a fuzzy cognitive map in the area under consideration (cognitive map to improve the administrative health of customs staff). In the final map view, each arrow that connects the

i and j factors has a weight denoted by $+_{Wij}$ This value, which is placed in the final matrix at the intersection of rows and columns, factor i and j, respectively, indicates the intensity or strength of the direct or inverse causal relationship between the two factors.

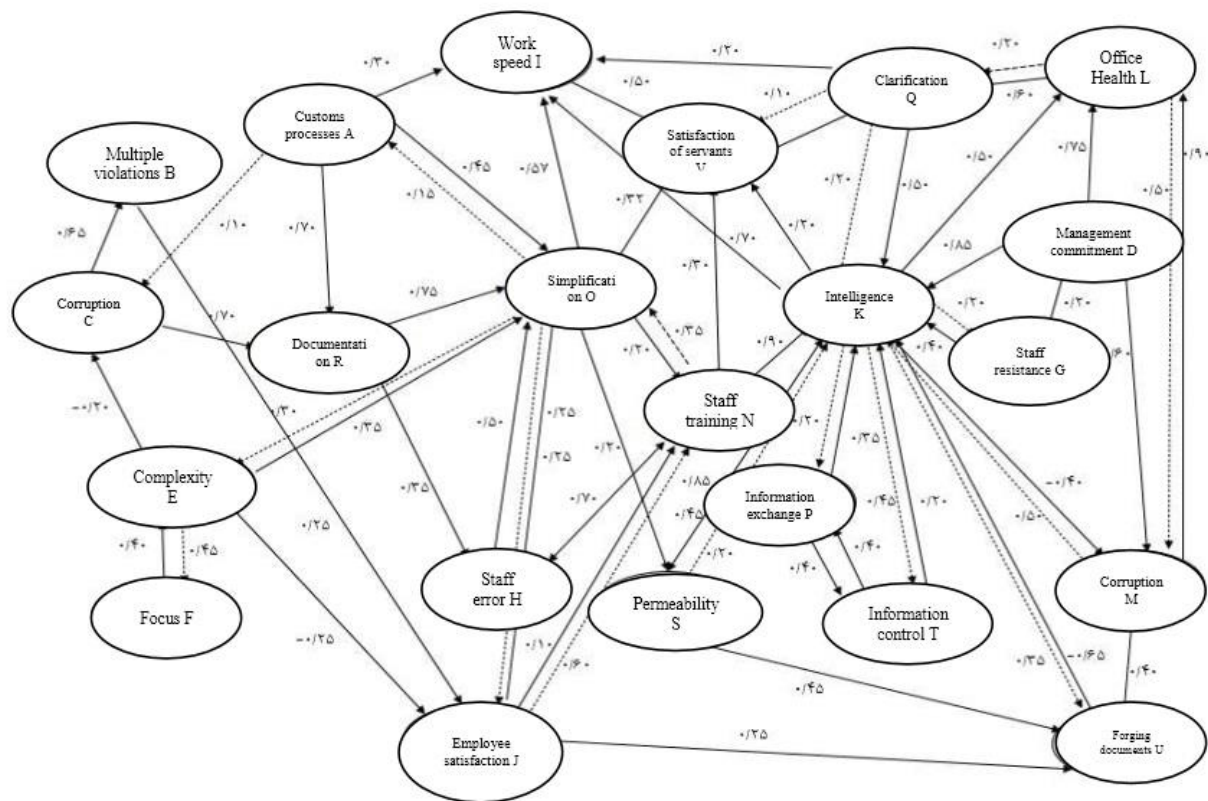


Figure 5. Visual display of fuzzy cognitive map and promotion of administrative ethics and health of customs employees using intelligent technology

How to rank key and influential variables in drawing the path of improving the administrative health of employees After drawing the fuzzy cognitive map image of

Figure 3, the key and influential variables are ranked based on the centrality index of Table 11.

Table 11. Ranking of key variables to improve office health

Variables (concept)	Output grade (Impact)	Input grade (Impact)	Degree of centrality
IT intelligence	1/20	2/10	3/40
Simplification	1/99	1/25	3/24
Office Health	1/10	1/90	3
Documentation	1/10	1/40	2/50
Staff knowledge	1/67	0/70	2/37
Number of corruption bottlenecks	1/70	0/55	2/25
Multiplicity of customs processes	1/55	0/70	2/25

Variables (concept)	Output grade (Impact)	Input grade (Impact)	Degree of centrality
Management commitment	2/1	0	2/1
Corruption	0/50	1/50	2
Customer satisfaction	0/60	1/32	1/92
Work speed	1/37	0/50	1/87
Transparency	1/30	0/50	1/80
Impenetrability	0/90	0/50	1/40
Forging documents	0/25	1/10	1/35
Exchange of information	0/75	0/60	1/35
Complexity	0/50	0/75	1/25
Staff error	0/50	0/70	1/20
Staff resistance	0/70	0/40	1/10
employee satisfaction	0/35	0/75	1/10
Information control	0/85	0/20	1/05
Violation cases	0/25	0/65	0/90
Focus	0/45	0/45	0/90

The column related to effectiveness indicates the effectiveness of variables (indicators) and its large value indicates the effectiveness of that index (variable) in improving the administrative health of employees. The effect of each factor is calculated from the absolute value of the effect of this factor on other factors, for example, the effect of the variable (index) of simplification of the customs process is calculated according to the following equation:

$$\text{Out}(oi) = \sum_{j=1}^n w_{ij}$$

$$\text{Out}(o) = 0.25 + 0.35 + 0.57 + 0.25 + 0.85 + 0.50 + 0.32 = 3.09$$

Also, the column related to impact shows the degree of impact of indicators. This means that a large amount on the index indicates that its changes are strongly influenced by changes in the indicators that affect it. The effectiveness of each index (variable) is one of the other indicators that can be obtained from the following equation on the effectiveness of the customs simplification index:

$$\text{IN}(oj) = \sum_{j=1}^n w_{ji}$$

$$\text{IN}(o) = 0.35 + 0.75 = 1.05$$

Degree of centrality includes the sum of influential and influential variables. The value of this index for each factor indicates

the degree of interaction of this factor with other fuzzy cognitive factors studied. Therefore, when analyzing the fuzzy cognitive map to improve the administrative health of customs staff, these indicators should be given more attention by senior managers of the customs organization. The index (degree) of centralization of the customs simplification process is obtained according to the following equation.

$$o(o) = \text{IN}(oi) + \text{OUT}(oi)$$

$$C(o) = 4.14$$

Analysis of findings based on data foundation theory and cognitive mapping in promoting office health. The value of using fuzzy cognitive mapping is well understood when managers can test their strategic changes and see the results of changes in pattern concepts, and fuzzy cognitive analysis allows managers to answer questions such as the following: Suitable 1- What are the different ways to achieve a specific goal? 2- Which of the following has the highest level of belief about feasibility among experts? Fuzzy cognitive mapping is in the category of soft methods and is an effective tool in system simulation. Fuzzy cognitive mapping can be used to identify performance indicators and success of corporate resource planning and scenario design (Belo Slavo 2010). In this paper, using the data theory, the

foundation of effective variables on office health in a paradigmatic model is extracted and using fuzzy cognitive map, the coordinates in the mental background of customs experts to identify key elements and intertwined staff health variables. To make a relationship transparent and understandable. To determine the effective and shaping variables of administrative health and the degree of influence of each of these variables (indicators) in the administrative health of customs employees by using the central relations. And senior managers and decision makers of the customs organization can take firm steps to achieve the purpose of the investigation. In this regard, an attempt was made to express the hidden angles between different variables of office health in a clear view of cognitive relationships in a clear cognitive map so that customs managers have a good view of communication and the degree of influence on factors affecting the promotion of office health. However, it should be noted that the basis and decision criterion of senior customs managers is the degree of centrality of each decision variable, which ultimately determines the final path to

achieve the goal, which is to improve the administrative health of employees. The basis of applying fuzzy cognitive mapping technique can be considered its ability to determine the exact paths to reach the goal. In this research, the ability to determine the path to achieve the goal, which is to improve the administrative health of customs employees with the approach of smart customs systems, has been used. According to Table 5, the criterion for identifying the path to achieve the research goal (improving the administrative health of employees) is the degree of centralization of indicators, smartening of customs systems (k), specialized training of employees (n), process simplification (o), documenting and monitoring processes (R), review Analysis of the number of corruption bottlenecks (c) are five important indicators in terms of the degree of centrality. Therefore, senior customs managers should focus on these indicators, which have the greatest influence on the variables of promoting administrative health, and spend the budget and time of the organization in this regard.

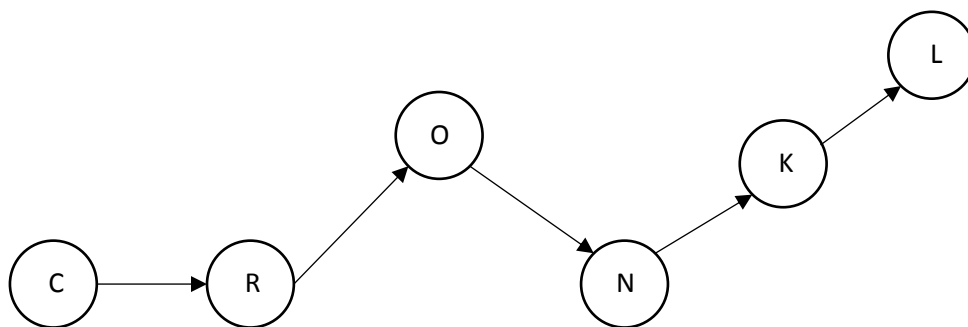


Figure 6. The path to improve the administrative ethics and health of employees taken from the fuzzy cognitive map

In the figure above, show the way to improve the administrative health of customs employees. This indicates that the documentation of customs processes (R) (export, import and transit) affects the simplification of customs processes (O) (export, import and transit) and the number of corruption bottlenecks (C). Also, specialized training of employees (N) in the field of laws, regulations and customs systems has had an impact on the intelligence of systems (export, import and transit) and this indicator (smart systems) by redesigning customs systems and smartening systems using new technologies. Like blockchain technology, it is effective in promoting the administrative health of employees (L). As a result, according to the most important recommendation of the World Customs Organization, which is to promote administrative health in order to streamline the clearance of goods and prevent the deposition of goods through customs, senior customs managers should have five key indicators (C), (R), (O), (N), (K) should be prioritized in their agenda. Also, customs decision makers should redesign the customs system based on the experiences of the customs of successful countries, using blockchain technology, intelligent risk management and the Internet of Things to make the customs system smarter. To witness an organization with a health-oriented approach using intelligent technologies to reduce the deposit of goods in customs.

Conclusion and Suggestion

The purpose of this research is to design a structural model based on the use of smart technologies in improving the ethics and administrative health of customs employees. In this research, the key variables on improving the ethics and administrative health of customs employees were firstly calculated by examining the comparative studies of the customs of successful countries such as the customs of the United Arab Emirates, Hong

Kong, Japan and China, and by using interviews with customs experts, the effective indicators or variables in the form of a model. The paradigm of foundational data theory was obtained. Then, explanatory structure modeling was used to investigate the relationship between administrative health variables and structuring and stratification of indicators. The results showed that the variable of using smart technologies is the first level variable and the variables of "analyzing the situation of manpower and customs processes, the moral character of employees and the laws and management of information technology and human resources" is the second level variable and the variables of "conditions and structure of the organization and requirements and infrastructures" Information technology is the third level variable. This means that in order to improve ethics and administrative health, the customs organization should spend the organization's resources and costs on the first-level variables of using smart technologies such as blockchain technologies, artificial intelligence, and the Internet of Things. Considering that in Article 9 of the Law on Customs Affairs, the customs office is obliged to provide facilities for the use of information and communication technology, and based on the note under the same article, the Ministry of Economy and Finance is obliged to issue the Electronic Customs Regulations within six months from the date of approval of this law. Therefore, it is suggested that the senior customs managers take into account the existence of the legal framework and the recommendations of the World Customs Organization to implement the solutions extracted from the research in order to witness a smart and law-abiding customs in the country.

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