Provide Strategies to Reduce Administrative Corruption in Public Organizations IT-Based Using a Combination of Analytic Network Process and Quality Function Deployment Model QFD

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ABSTRACT

The purpose of this research to prioritize the factors affecting administrative corruption in government organizations using analytic network process until the arrival of prioritized dimensions to Quality Function Deployment model, provide appropriate strategies for solving this basic organizational problem. This study is a descriptive survey research and located into the category of applied research and to data collection a combination of the library and field research methods have been used. In this study finite sampling method is used. Population includes managers and staff of government organizations in Tehran. Reliability and validity of the questionnaire were analyzed using Cronbach's alpha tests and factor analysis has been studied. Statistical data using statistical tests including Kolmogorov-Smirnov and t - student tests are analyzed. The results of the analytic network process shows that the dimensions of control methods, cultural characteristics of society, organizational characteristics, quality and quantity regulation, employees' economic status are the highest importance, respectively. Using 13 experienced managers from government organizations in Tehran who were willing to do the interview and after the removal shared solutions, in this step, 12 strategies of improvement IT-based are extracted and finally, with respect to the output of quality home and the weights are obtained the priority strategies are determined.

Keywords: Administrative Corruption, Information Technology, Government Organizations, Analytic Network Process Technique

1. Introduction

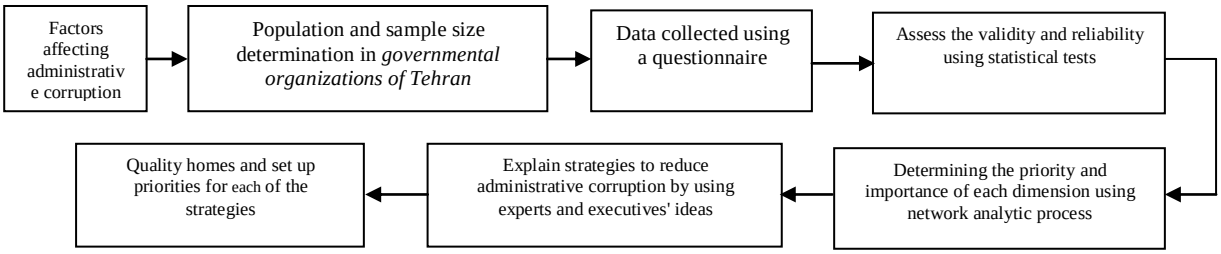
Administrative corruption, a major problem in many government organizations of world countries is considered, which is not unique to developing countries. Even in the developed and industrial countries there is administrative corruption and lack of official health (Soot, 2012).

Unfortunately, in some countries where administrative corruption is ingrained at different levels of government and has spread for a long time. Many people and authorities not only mistakenly believe that there is not a way to solving the problem, but a few have promoted so far believe that administrative corruption is an inevitable action and have not economic consequences (Larmour, 2001). In this regard, different solutions have been offered that focused on role of government and administrative structure. Including: Depoliticized administration system, deregulation, downsizing, and optimization and reengineering of organizational system and its structure (Sosa, 2004,). But so far, the role of information technology in reducing administrative corruption is less interest. Information technology in form of e-government, e-banking and etc probability of finding an error by storing the details of the transaction data in the systems with source has increased and provides probability of follow -up activities, and explore corruption resulted of improper activities and it also can impeach the citizens and organizations about irrational activities and arbitrary exercise of government and prevented from doing it in public systems (Wu, 2011). The implementation of e-government and e-banking using activities tracking systems make it transparency and trust of the people and prevent the occurrence of administrative corruption and bribery.

Thus creating a transparent and accountable environment based on trust and transparency in information and communication and applying new technologies of information is achieved and is a unique strategy of reducing administrative corruption.

2. Methodology

Research methods and procedures are specified in the following graph:



3. Concepts

3.1. Information Technology (IT)

There are several definitions in relation to IT that any dimensions and aspects of IT are introduced. Some of the most important and most comprehensive IT definitions are mentioned as following:

- IT including: Technologies that help us to capture, store, process, retrieve, transmit and receive information. Including the equipment that will be used for this purpose include: computer, network, communication equipment, fax and electronic applications.

- IT including technologies that help people to capture, store, process, retrieve, transmit and receive information in the form of audio, video, graphics, text, number, etc. using computers and telecommunications tools (Farhangi et al., 2010).

- In general, IT is a wide range of equipments, computers, tools, data storage, network connectivity devices, applications and services are used by organizations to make data, information and knowledge (Peslak, 2012).

3.2. Role of IT in Development

On the role and impact of IT in development, there are three approaches:

1. Supporters of IT development: Proponents of this view believe that employed the techniques, are naturally development factors, and whatever countries rely on new technologies of information, their status will be better.
2. Opponents of IT development: scholars and thinkers in this category not only opposition to information technology and innovations but causes such as: belief negative effects of development the technology on community, this technology will not prioritize between the different needs and fear of misuse of these technologies by producing companies and countries for their own benefit and for detriment of third world countries are opposed.
3. Conditionality proponents of IT development: The group with the knowledge of the positive and negative effects that technology believe to intelligently plan in the exploitation of this technology so resulting to maximize positive outcomes and control and reduce negative outcomes resulting from the development of IT.

3.3. Administrative Corruption

The term "corruption" comes from the Latin verb "rump ere" meaning break. So something breaks or is violated in the corruption. These things may be a way of moral or legal treating or often administrative regulations. But currently and publicly, corruption means defrauding and cheating and all works have represented law and regulations. Corruption means taking something and instead put something like that or something false (Taghavi et al, 2010). Due to the variety of illegal behaviors that are administrative corruption, different definitions of administrative corruption have been presented by researchers that each included subset of these actions, there we are referring to some examples:

- Gonarmirdal, corruption in the widest sense is defined. According to him, all various forms of diversion and applied personal power, illegal applied of power and job status, is applicable.

- Corruption arises when a public official in exchange for doing something that was not take action to it, accept cash or materials bribe.

- Administrative corruption, illegal use of administrative /government authorities for self-interest (Rabl & Kuhlmann, 2009).

- (Soot ,2012), also draws another picture of corruption. His opinion, administrative corruption refers to the behavior of those public sector employees for their private interests, violate accepted standards.

3.4. Different Approaches to Corruption:

- Legal approach: In this approach, a set of codified administrative laws and regulations suggests that determine framework of authorized administration activities – then any administration behavior contrary to the rules and motivation of the perpetration of those, and to be of self-interest, perceived as administration corruption.
- Economic approach: This approach with a bit overlooked, is same market-based approach.

According to this approach corrupt behaviors of public sector employees are those that their profits increase through the mechanism of supply and demand at work.

- Public-oriented interest approach: Under this approach, behavior that is against public benefits will be considered as corruption. Accordingly, corruption is results of special interest of groups and government personnel and is harmful to public interest of society.
- Revisionist approach: Corruption from revisionist view is a function input for social development and a necessary evil for social order in underdeveloped countries, where corruption as a risk factor increases efficiency (Freckleto et al, 2012).
- Ethical approach: Under this approach, corruption is a defect of contract that occurs between the government

and government employees. One criticism of this approach is that there is not any difference between partial and total corruption and corruption by low-and high-ranking officials.

- Public intrest approach: Supporters of this approach believe that corruption is defined according to the views of the public. There is a major problem in this approach is that it is often considered the views of all people, so that the measure corruption by organization, pays to study people's perceptions.

3.5. Factors Affecting Corruption

Corruption as any other acts that person doing has rational roots. That is when someone commits fraud in view of itself expected benefits exceed the costs of expected action. Corruption in every form and context requires two basic conditions which are "desire" and "opportunity": "desire" is related to committing fraud and "opportunity" or to be ready environmental conditions. If desire and opportunity provide together corruption will be born and will grow in the preparation of other conditions (Rasoli and Shahani, 2009). In a classification most important of the factors affecting the incidence of administration corruption has been presented as follows:

* Administrative and management factors * cultural and social factors* political factors*economic factors* organizational and administrative reasons * social and cultural reasons* psychological and behavioral reasons * Cultural and historical factors* social and environmental factors * poverty and deprivation*

3.6. The Effect of Information Technology on Administrative Corruption

The main enemy of corruption is transparency. Although "transparency" has been come into use and lost its meaning in recent years, an anti-corruption strategy that does not reinforce transparency of governmental management is doomed to failure. One of the newest methods discussed for reduction in corruption opportunities in governmental management is to resort to information and communication technology, which has been manifested in electronic government, electronic banking, and other faces of information devices. Information and communication technology is expected to increase transparency of processes and decisions because other devices are not able to do this. It is believed that application of internet and other information devices will finally replace with unclear and arbitrary decisions and at present, information technology can be regarded as the best method to fight with administrative corruption (Danaei Fard, 1384). Therefore, e-government, referring to the use of information and communication technology, will cause forming an efficient government in consumption of public expenses, provide better public services with citizens, and remove corruption increase public satisfaction due to public access to information and more responsiveness of government to the citizens. Thus, experts in information technology believe that the main effect of information technology on corruption is transparency and discontinuation of the officials and citizens' relationship to governmental sector, which remove corruption. However, do these realities of intergovernmental organizations emphasize this issue? (Chakraborty,2012) have an optimistic judgment of this belief by providing some examples. Because of being youth of IT in Iran, a case of several countries has been presented based on the experiences of some experts.

Senior managers of a ministry in Southern Africa called Ministry of governmental affairs had faced with the problem of imaginary personnel in ministries. These personnel were in the list of fees and salaries and received monthly salaries and wages; however, they did not an external existence. One of the personnel in charge of salaries and wages received the monthly fees of these personnel. The wage and salary system was changed into a computer one and the personnel in the list and actual personnel of organization were controlled during this process. Based on this control, the status quo was exactly determined and the imaginary personnel eliminated.

It seems that the ministry solved the problem by automatic control of computer system between real and imaginary wages and salaries and discovery of the conflict between these two; however, this was an unrealistic imagination because the operator of computer received the wages and salaries of imaginary names of 30 people in addition to his/hers. After 18 months, it was turned out that the governmental corruption has been replaced with computer corruption (Andersen et al, 2010).

3.7. Quality Function Development (QFD)

Development of quality function is a process of development and improvement of product and a complex managerial process, which requires multitasks teams of several views and specializations (Cheng et al., 2004). In fact, QFD is an instrument that facilitates the use of simultaneous engineering process and group work in order to achieve the common goal of organizations of clients' satisfaction (Halog et al., 2001).

3.8. Analytic Network Process (ANP)

Analytic hierarchical process (AHP) and Analytic network process (ANP) are two different concepts introduced by Mr. Saaty. According to his definition, ANP is a general and more complete model of AHP that allows analysis of different problems by establishing relationships between elements (Saaty, 2001). This mutual relationship is sometimes called feedback systems. He developed a method called super-matrix for calculation of these factors weight. Super-matrix adjusts the effect of weights of interrelated elements by considering a matrix and all options and elements.

The process of modeling ANP is composed of two stages in issues of decision-making: formation of a network diagram and definition and determination of elements prioritization. Priority of each dimension of six dimensions influencing administrative corruption has been identified by ANP in this research.

4. Research Model

According to theoretical studies, the process of this study has been displayed in combination with conceptual model (Figure 1-3).

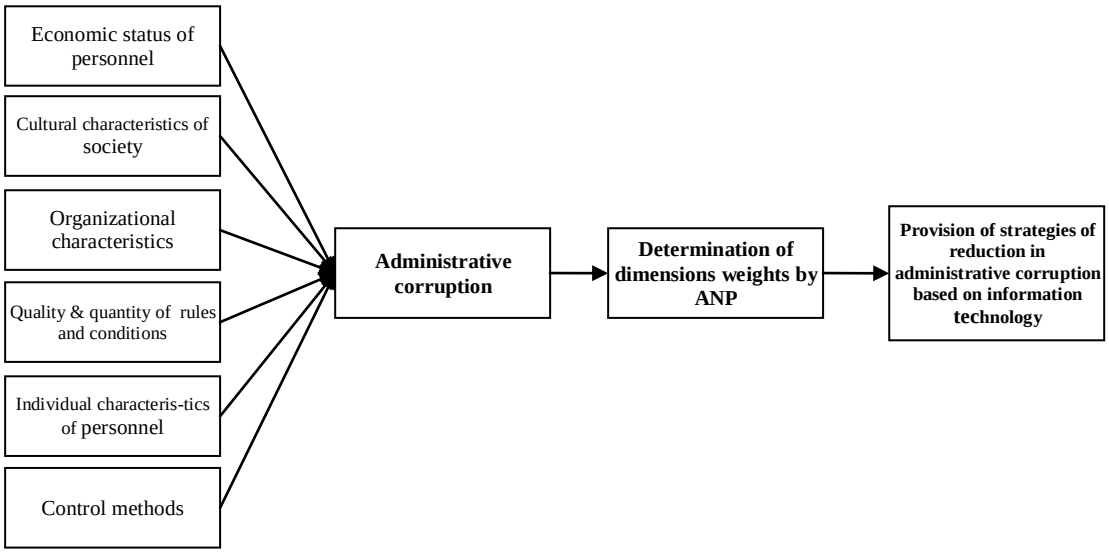


Figure 1.3. Process and model of conceptual model

5. Methodology

This study is a descriptive survey and is classified into applied research. The purpose of the study is to present strategies for reduction in administrative corruption on the basis of information technology using incorporation of ANP and QFD model. Table 1.5 shows the methodology. Considering final indicators, the research questionnaires were made and distributed among the participants of the study who were managers and personnel of government organizations in Tehran. The questionnaires were randomly distributed among 30 managers and personnel and the participants of the study were selected with regard to their estimated standard deviation.

It is notable that just experts and senior managers of governmental organizations were studied to determine the weight of dimensions as a paired comparison and also to complete the model of QFD and provision of improvement strategies on the basis of information technology. Most data were obtained from the standard questionnaires that were the main basis of the study; however, their reliability and validity were evaluated again. The reliability of questionnaire was examined by Cronbach Alpha. Coefficient 0.931 indicated high reliability of questionnaire. The validity was calculated by factor analysis and the obtained degree 0.935 indicated the high validity of questionnaire.

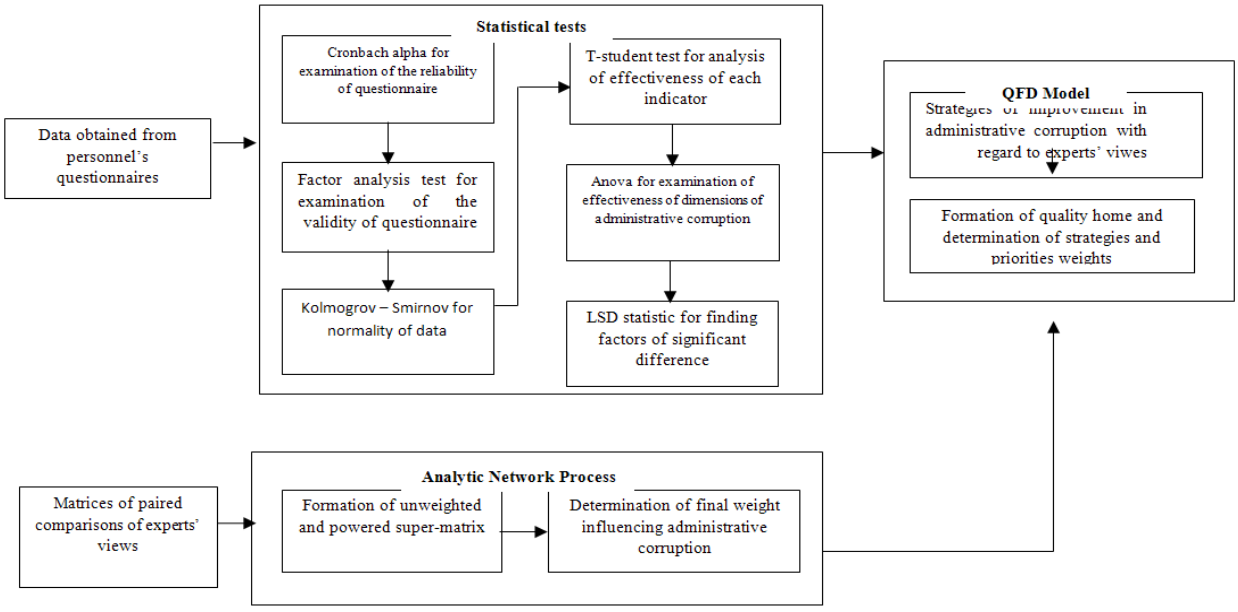


Table 1.5 Methodology of performance test and ANP and QFD

5.1. Data Analysis

Kolmogrov – Smirnov was used to determine the normality of data and it showed the normality of data at 0.83 level of significance. T-student test was used for the data obtained from questionnaires in order to examine the effect of each dimension of six dimensions on administrative corruption in governmental organizations. It was found that one of the dimensions (individual characteristics of personnel) had a significant effect on administrative corruption and other dimensions were also effective. In addition, Anova statistic was used to understand the degree of effect of these dimensions on each other. According to the table of variance analysis at 95% level of confidence, there was a significant difference between average factors influencing administrative corruption. With regard to the significant level leff than 0.05, at least one group of six factors differed from other groups. Moreover, LSD statistics was employed to make the results more exact and understand the significant difference between each group.

The results of LSD test showed that all groups were significant different from the fifth dimension (individual characteristics of personnel) and there was not a difference between other groups.

Table 5.2 The results of ANOVA test

ANOVA					
	Total squares	**df**	**Average squares**	**statistics**	**Significance level**
Between groups	22.995	5	4.599	5.462	.044
Within groups	1385.814	1645	0.842		
total	1408.809	1650			

5.2. Statistical analyses of questionnaire of ANP

With regard to the questionnaire of paired comparisons that was distributed between 13 organizational managers, matrices of paired comparisons and normalized decision were formed by time norm and weight vectors related to dependence between factors influencing administrative corruption. One of the important points of paired comparison matrices is their compatibility. According to Saaty, the innovator of AHP and ANP methods, it is necessary that the rate of matrices' compatibility is equal to or less than 0.1 in order to stabilize the judgments. Therefore, if the rate is more than 0.1 in some matrices of paired comparisons it is necessary to repeat the judgments by the experts in order to stabilize the matrices and then calculate the average geometric cells of comparison matrices. The compatibility rate of all of the matrices is less than 0.1. Thus, the responses are stable and approved. Table 3.5 shows the final weight of factors influencing administrative corruption with regard to the results of model solution in a form an unweighted and powered super-matrix.

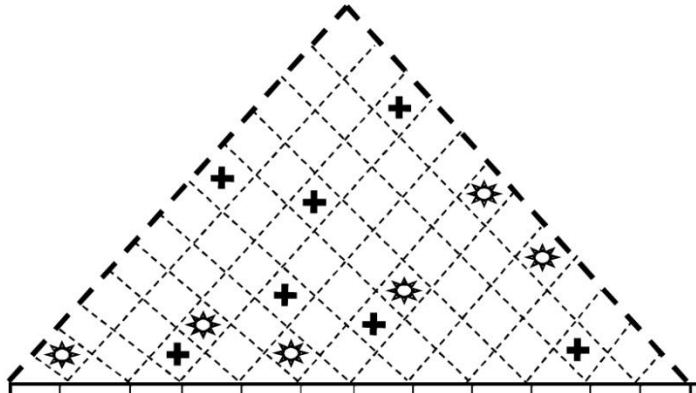
Table 3.5 Final weight of factors influencing administrative corruption

Alternatives	**Total**	**Ideal**	**Ranking**
Quality and quantity of rules	0.1784	0.8898	4
Control methods	0.2005	1.0000	1
Economic status of personnel	0.1374	0.6854	5
Individual characteristics of personnel	0.1021	0.5094	6
Cultural characteristics of society	0.1956	0.9753	2
Organizational characteristics	0.1859	0.9272	3

In this study, inputs of QFD model are dimensions that have had a significant effect on administrative corruption and as observed, the dimension of individual characteristics of personnel had not a significant effect in the first questionnaire and had the last priority in the second questionnaire. Therefore, the other five dimensions will undergo the improvement stages as the inputs of quality home.

After elimination of common solutions and interview with 13 knowledgeable managers of governmental organizational of Tehran, 12 improvement strategies were extracted on the basis of information technology and significance of each strategy, degree of effectiveness on input indicators, difficulty in achieving goal, cost of goal achievement, and also absolute weight of each indicator were determined.

12 strategies and their effect on each other are specified in columns of quality home and roof, respectively. Absolute and relative weights of strategies were found for prioritization with regard to managers' valuation. As shown in diagram 1.6, strategies can be prioritized according to different bases. For example, strategies of producing of detection and determination of competence software for getting posts and expertness towards meritocratic with regard to experience, education, specialization, clearance, degree of satisfaction, etc. automatically or systematically, operating an integrated system of data of the available island systems, and establishing a database for data inclusion of administrative corruption for getting feedbacks and control are prioritized for implementation based on absolute and relative weights. On the other hand, as seen in the roof of quality home, the strategy of establishing managerial dashboard for managers and principals of sectors to be aware of all important and current affaires has a more positive effectiveness on other strategies. Therefore, a special attention should be placed on it.



	Complete information of knowledge of prevention of violations in portal	Sending email and SMS to clients in order to prevent violation	Establishing managerial dashboard for principals of sectors and managers to be aware of all affaires	Producing a software for determination of peoples' competence for organizational posts	Control and adjustment of works by systematic financial exchanges	Making a system for reporting at the time of suspicious transactions	Systematic examination of the personnel leave and entertainment rates during a year	Making an integrated system of tenders in organization by a multi-stage supervision	Operating an integrated system of data of the available island systems	Operating E-learning system for rapid and targeted training to reduce the administrative corruption	Operating a computational system of personnel rewards based on yearly gain of organization	Establishing a database for data inclusion of administrative corruption for getting feedbacks and control	(Level of significance (based on ANP
Control methods	7	7	7	7	7	7	3	7	7	3	3	7	0.2005
Cultural characteristics of society	3		3	3			3	3	7	3	3	5	0.1956
Organizational characteristics	7	7	7	7	7	7	5	7	7	5	3	7	0.1859
Quality and quantity of rules	7	7	7	7	7	7	5	7	7	7	3	7	0.1784
Economic status of personnel				7			3			7	7		0.1374
degree of difficulty to achieve the goal by available facilities	2.1	2.7	3.5	3.8	1.9	4.6	2.4	2.6	5.2	2.3	2.6	3.7	
Cost of achieving the goal	2.3	1.3	3.1	2.4	1.6	3.7	2.3	2.8	4.6	2.1	2.1	3.3	
The status of organization in implementing these goals	1.8	1.5	2.2	1.7	2.6	1.4	1.4	1.3	1.5	1.2	1.5	1.4	
Absolute weight	4.54	3.95	4.54	5.5	3.95	3.95	3.42	4.54	5.33	4.33	3.24	4.93	52.21
Relative weight (%)	9	8	9	11	8	8	7	9	10	8	6	9	100%

Graph 1-5: Model of Quality Function Deployment to become effective dimensions on administrative corruption (optimal strategy IT- based)

6. Conclusion

Rapid growth of information technology has limited the activity of traders and rent seeking merchants of unclear environments and it is explicit and correct to survive governmental management towards change and fundamental improvements in order to make more transparency and timely information. Information technology can be one of the important solutions in reducing corruption and increasing transparency of governmental activities (Sharifi Renani et al., 1390). It was tried to explain strategies for reduction in corruption in organizations of country by the opinions of personnel and managers of governmental organizations and investigate the factors of administrative corruption in order to prevent probable corruption by prioritizing and spending the lowest cost. As it is known, establishing managerial dashboards meaning accurate and correct supervision and control, and also establishment of databases are one of the important strategies in this regard. Since all information and transactions are conducted on the basis of technology towards commercial intelligence and they find their way in the world of technology; therefore, it can be understood that basis of all of these strategies is the establishment and application of analyzed data warehouse for achieving logical roles and getting cube with reports of data warehouse on the basis of these roles, which are a foundation for behavioral analysis of data that can be the basis of future researches for reduction of corruption in governmental organizations. Finally, it is notable that corruption, which results in increasing social felonies and family problems, etc., can be prevented by prevention instruments and provided a life with peace, comfort, and confidence with citizens.

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