Combating Corruption and Information & Communications Technology (ICT): Evidence from Tehran Metropolitan Municipality

Leili Habibi
Seyed Mohammad Moghimi (Corresponding author)
Faculty of Management, University of Tehran, Tehran, Iran
moghimi@ut.ac.ir
Hassan Abedi Jafari
Mohammad Abui
Seyed Moose Pourmosavi

Abstract
Corruption and fighting it as well as the revolution in information and communications technology can be considered the two headline-making issues in the studies of the modern era. On the other hand, bribery and bureaucratic corruption in the public sector, including local governments, has now turned into a major global concern and the developing countries, as well as the developed ones, are faced with bribery and bureaucratic corruption at various levels (central, local, etc.) and, along with good governance, they have adopted numerous strategies and models to fight them.

On the other hand, high velocity technological advances have led to creation of a new paradigm in addition to the paradigm of good governance of activities. In this paradigm, work activities can be performed and followed up at any time and place within the real or virtual space. The virtual environment and various communication technologies have created a new area for governance and management. In this era, any manager needs to analyze the effect of the virtual and electronic work environment on the health and authenticity of his government, organization and institutions and adapt himself to them.

Besides providing a brief description of the dimensions of information technology, corruption and various approaches to fighting it, using a mixed (quantitative and qualitative) method, authors of this paper have studied the relationship between bureaucratic corruption and information technology at Tehran Metropolitan Municipality and eventually, have proposed strategies for fighting corruption with emphasis on information technology. Findings obtained from this research and analysis of the data indicate that by using information technology, client awareness, information transparency and accountability at local and municipality levels increase and through improvement of communications, bureaucratic corruption decreases. However, with regard to numerous causes and factors involved in creating corruption and its complicated dimensions and characteristics, managers and central and municipal authorities must adopt a holistic, systematic and processing approach (prevention, control and combating) to fighting corruption.

Key words: Bureaucratic corruption, information and communications technology, panoptic prison, good local governance, transparency, accountability, access to information, raising awareness.

1. Introduction
Since the early 1990s, the issue of transparency and before it good governance has assumed prominence in improving governance, primarily through the increased attention given to increasing citizen participation, enhancing civil society engagement in the public arena, fostering closer accountability, as well as in combating corruption. Transparency has been recognized as a means of ensuring an informed citizenry and for pursuing a collective vision. It exposes the public space thus allowing every stakeholder to remain aware of achievements and setbacks of the government. It motivates collective engagement and builds community identity by enabling every member to identify with processes, results and outcomes. Indeed, through transparency the boundaries of responsibility and action are rendered visible thus easily determining the locus of accountability. In addition, transparency limits corruption, which tends to thrive in closed systems that are ridden with ambiguity and discretionary behavior.
Abu Nasr Farabi while enumerating the attributes of the ignorant, refers to six types of them including: confining to
instances in various schools and ideologies and numerous types of it have been mentioned. In the fourth century AH, we must prevent from, control and fight whatever works against development plan and sustainable development. On live in a society that its future perspective should be realized in the context of sustainable development, therefore, and directing public funds to their own pockets. Besides, bribery leads to deviation in allocation of housing subsidies. Reaction against prosecuted employees often means that benefits of municipal contracts will go to the pockets of unqualified companies. Municipal services may not be accessible without making unofficial payments. Issuance of licenses and certificates is facilitated due to the speed money paid and sometimes, they are bought through bribery (Observer, 2008: ). The World Bank has rated corruption at various organizations based on the area of their activity from 1 to 10, that is, the lower the score, the more corrupt that sector is. The public affairs sector, in which municipalities are involved, with the score of 1.3 was identified as the most corrupt sector among various areas. Another significant issue is that since local governments in many countries are susceptible to individual as well as organizational corruption, fighting bureaucratic corruption at municipalities is necessary due to the heavy expenses that this problem imposes on municipalities. Among these expenses are the following:
- Reduction in the tax revenue of municipalities
- Increase in the general expenses of municipalities
- Reduction in social and political security of the citizens
- Disturbance in implementation and effectiveness of the decisions made at senior management levels of municipality on its body (World Bank: 2000)
Although annual Corruption Perception Index (CPI) does not directly refer to bureaucratic corruption at the local level, but taking into consideration the above-mentioned issues, it must be stated that local governments are not excluded from this negative perception. In fact, there is a widespread perception which suggests that some changes within the global context such as decentralization have increased bureaucratic corruption. Actually, decentralization can increase bureaucratic corruption or at least, spread it over more dimensions and make it difficult to manage. On the other hand, decentralization and strengthening civil society may easily make bureaucratic corruption more conspicuous in the eyes of the public, such that citizens are persuaded that bribery and bureaucratic corruption has become more widespread than the past. Bribery can seriously bring accessibility to resources for providing local services to corruption and also prevent citizens, especially poor citizens, from accessing such services (World Bank & United Cities and Local Governments, 2008: 81).
In regard to the role and significance of civil services as well as municipalities in the lives of people and since we live in a society that its future perspective should be realized in the context of sustainable development, therefore, we must prevent from, control and fight whatever works against development plan and sustainable development. On the other hand, new public management model emphasizes new strategies such as the governance and transparency theory, entrepreneurial government, and accountable and citizen-centered government and stresses performance assessment and management at governmental organization using a new approach and criterion called customers' and citizens' satisfaction. One of the strategies in achieving these important goals is reducing corruption in its various dimensions, including bureaucratic corruption and one of the strategies in reducing bureaucratic corruption is use and expansion of information and communications technology at municipalities. Thus, having understood this major issue, the researcher seeks to find an answer which would explain the effect of using information and communications technology in fighting and reducing corruption and in this regard, the effects of four dimensions of information and communications technology including transparency, accountability, communications and awareness on bureaucratic corruption have been studied by using a scientific method and based on the findings, some strategies have been proposed.

2. Literature review
2.1. A brief look at bureaucratic corruption and fight against it
Corruption in its broadest and most widely used definition consists of misuse of public (governmental) facilities and resources in order to serve personal or group interests. Corruption means intentional manipulation of granted power or position. In corruption, intention, illegality and replacing public interest with personal interest are all present. Therefore, corruption occurs when a government official or government agent sacrifices public interest for personal or group interest (K. Jain: 2001).
Also in the political literature of the Muslim thinkers, corruption is a relative matter and has different concepts and instances in various schools and ideologies and numerous types of it have been mentioned. In the fourth century AH, Abu Nasr Farabi while enumerating the attributes of the ignorant, refers to six types of them including: confining to
the necessities, seeking wealth, seeking pleasure, seeking fame, seeking domination (despotism) and indifference. Khaje Nasir al-Din al-Tusi in the sixth century AH and Abdul Rahman Ibn Khalidun in the eighth century AH refer to three types of corruption including despotism (dictatorship), seeking luxury and indolence (Abolhasani, 2008: 4, as quoted Farsi, 1990: 371).

2.2. The factors causing corruption with emphasis on the systematic approach

What causes corruption? Many political and sociological theories approach the question from a macroscopic point of view. These theories include: the functional approach, political institutional approach, revised modernization approach and cultural approach. Like other macro-analyses, these approaches provide a grand view of the problem, but fail to delineate the process and the motivation behind corrupt behavior. As Collins argues, "Sociological concepts can be made fully empirical only by grounding them in a sample of the typical micro-events that make them up... [The] dynamics as well the inertia in any causal explanation of social structure must be microsituational; all macroconditions have their effects by impinging upon actors' situation motivation. "(1) Thus, corruption as a social problem cannot be adequately explained by macroscopic analysis alone. Moreover, an individual macro-theory cannot provide a satisfactory explanation of corruption, as countervailing forces will be effected by other macro factors. Thus, an integration of macro-theories and a macro micro linkage are necessary to further an understanding of corruption (Chan, 2011: 1).

Why is bureaucratic corruption a suitable topic for discussion and research and many statesmen, politicians and managers of the central and municipal government fight against it? Due to the following reasons we must prevent from corruption and fight against it:

Corruption has a devastating effect on municipal governance and quality of life in cities and if sensitivity is not shown against it, it will hinder fulfillment of social, economic, environmental and political goals of the cities. Corruption undermines the competition of the free market, reduces organizations' readiness for investment, and prevents the growth of the number of entrepreneurs.

Furthermore, corruption endangers the legitimacy of the principle of equality before law and decreases public confidence in political institutions. Corruption also damages major prerequisites for economic growth and democratic governance (Anechiarico, 2009: 1).

In short, corruption's negative impacts include the following:

• Undermines economic growth, by diverting resources to inefficient or unproductive sectors or actors; by reducing income tax and other revenue sources; by increasing the cost of doing business; by reducing the quality of contracted works; and ultimately undermines investor confidence and contributes to capital flight.
• Undermines poverty reduction efforts, as less resources will be available for social programs; through poor targeting of beneficiaries, both in terms of the overall effectiveness of services, and making services accessible to more citizens on an equitable basis;

Undermines the safety, environmental health and the sustainability of cities, health and zoning regulations are ignored; and by weak enforcement of environmental protection policies and regulations, may even compromise the needs of future generations;

• Threatens political stability, particularly in the case of systemic corruption. The loss of public confidence in the rule of law, justice and governance institutions can lead to political instability and even civil strife.

“A state with endemic corruption can be especially brutal to the very poor, who have no resources to compete with those willing to pay bribes” (UN-Habit and Transparency International, 2004: 6, 1).

In general, since corruption is latent and incalculable, it is radically a nondemocratic phenomenon and damages democratic processes and institutions. Mid-level and individual effects of corruption must also be taken into consideration. Among direct effects which committing violation might have on an individual the following can be mentioned: stress and anxiety, guilty conscience, psychological and emotional vulnerability, instability in thought, personality and performance.

In central or local governments and governmental organizations, etc., there are various focal points of corruption, some of which are as follows:

- Public procurement: units and departments which are in charge of purchasing the supplies required by public organizations
- Tenders and auctions
- Various human resources management processes including employment, promotion and appointment, payment systems, etc.
- Privatization and outsourcing of activities, etc.

2.3. Information and communications technology, electronic government and municipality
High velocity change caused by globalization, technological innovation, fierce competition, and rapid knowledge growth has created immense turbulence in the environment for organizations. The pace and unpredictability of this change make it difficult to use past experience to plan future action. Organizations must instead develop the ability to respond spontaneously to environmental threats and opportunities as they arise. By eliminating the boundaries within and between organizations that constrain action, organizations can move more nimbly.

Boundaries may exist between individuals, groups, departments, levels of authority, geographic regions, cultures, temporary and permanent employment status, time periods, competitor and collaborator status, customer and employee status, purchasing and selling organizations, and work and home (Davis, 2003: 303).

In the present environment, rapid advance of information and communications technology and the increasing trend of transformation of organizations from traditional to virtual in various fields such as research and development, marketing and sales and even nonprofit, service providing organizations of central, local and municipal governments, etc., provides organizations with considerable global accessibility and communication abilities (Kelley, 2002, 461).

And since one of the significant issues in the present era is application of information and communications technology (ICT), in case it is materialized, it can play a major role in the social affairs. In this regard, one of the concepts which have recently been widely considered in various communities is the concept of E-government and city. E-government and city is a government without walls and buildings which has virtual organizations that provide online governmental services for the citizens. Creating E-government and city yields many results which besides reducing governmental expenses and providing information for the citizens, can reduce bureaucratic corruption, increase transparency, boost employee responsibility and lead to constant improvement of procedures, processes, etc. In fact, it could be claimed that establishment of E-government, municipality and city will lead to a dramatic revolution in people’s lifestyle, organizations and governments of different countries. By establishing an effective and efficient and not symbolic E-government, bureaucratic health is improved and corruption reduces.

2.4. Fighting corruption and information technology

Bureaucratic corruption is a pervasive and universal phenomenon and (local and national) governments and bureaucratic systems of all countries are more or less affected by it. The characteristics enumerated for corruption indicate that government, municipal,... managers can hardly identify and discover corruption.

Different strategies, tools and views on fighting corruption have been proposed by scholars and researchers. One of these views is “panoptic prison” based on which information technology is the key to enabling government management to control corruption.

Apart from “corruption of opportunity” which is caused when the opportunity and grounds for committing corruption is created, two particular kinds of corruption can be distinguished:

- “Corruption of necessity” which is committed by low-ranking bureaucratic employees with low salaries. Modern information system kills in the bud these employees’ radical motivation for earning extra income. However, the idea of panoptic prison and information technology is simply a weak strategy for solving this problem.

- “Corruption of greed” which is committed by those employees who receive a high salary. This group of employees occupy senior positions and enjoy a sufficient income nevertheless are driven by avarice; because they are in a position where the grounds for receiving an extravagant income is prepared. Taking into consideration these employees' power to determine work conditions, information systems are unlikely to decrease corruption committed by these individuals, unless a sort of extremely powerful external surveillance is exerted on them. Such employees will remain hidden from the control of the panoptic prison, which is another limitation of this view as a practical guidance (Danaifar, 2006: 111).

In all these instances, it can be said that corruption is caused by the combination of two sets of factors:

a) Micro level: individual, his circumstances, needs, skills, access, security and freedom of action.

b) Macro level: organizational systems, policies and culture.

As noted above, management decisions about computer information systems may affect skills, access, security and freedom of action. Nevertheless, it is very unlikely that it should affect personal or environmental incentives surrounding corruption and therefore, the ideal of the “panoptic prison” which claims that through information technology corruption can be controlled is not realized.

What is inferred from the above-mentioned issues is that IT-based systems within the “panoptic prison” view influence the effects and complications caused by a corrupt system rather than its causal circumstances and causes; because as it was mentioned, corruption is a phenomenon which has its roots in the political, cultural, social and economic conditions. Information technology has but little effect on the root causes of corruption. It has potential limitations and cannot effectively fight corruption and eliminate it (Danaifar, 2006: 112-113).
2.5. Picci’s work regarding using IT in monitoring and holding tenders
Lucio Picci has argued that the integration, within an Internet-based information system, of monitoring and voice activities, and of an appropriate incentive system, could contribute to a governance model characterized by effectiveness, efficiency, and lack of corruption.

The proposal is prone to further developments. For example, if candidate projects are recorded in the information system before they are selected, then room is created for participatory forms of decision making. Within this context, the public could be entitled not just to ex-post voice activities, but also to present proposals for new public works, and the Planned reputation-based governance model would support far reaching “electronic democracy” practices, where the word “democracy” would be taken both to mean participation, and accountability.

The monitoring system range of action could be increased. Public works shape the territory where they are constructed, and suitably organized information on them would allow for a vast series of activities that require to process information about a given territory, and would be very useful in planning exercises of many forms.

A further consideration is in order. The present proposal, with its emphasis on data collection, and on the organizations of automatic data processing procedures, should be seen within an ongoing process that is gradually changing our appreciation of the quantitative aspects of public administrations and, more generally, of governance.

The study of corruption provides a good exemplification of the issue. As we saw, in the 1990’s several organizations made available perception based corruption and governance indexes. Golden and Picci (2005) provide a measure of corruption that is based not on perceptions, but on hard data. Moving from measuring perceptions to constructing measures that are based on objective data is a process that deserves encouragement. However, such a process is difficult to realize, because objective data are often hard to find, and very time consuming to organize.

The methodology proposed by Golden and Picci (2005) could certainly be carried out for countries other than Italy. Such an endeavor would be intrinsically expensive, and by necessity it could hardly be sustained on a regular basis, to provide for a timely updating of information.

The availability of an information system of the type here proposed, however, would allow for an “integrated” monitoring system, with all its qualities. Such a monitoring system would compute a vast array of useful indexes and measures, and would help address a more general problem that besets current studies on public administration’s related fields: the difficulty to collect suitable quantitative information.

These considerations help casting the proposed governance model under a different light. The stated issue is about improving governance. However, it is also about the creation of a conceptual and technological model for the systematic organization and collection of quantitative information about the working of a governance system. The two issues, in fact, are closely related (Picci, 2005:16). But the question that is raised is whether the effective use of information technology along with other strategies may be helpful.

Within human and divine logic, justice is an inherent and definitive necessity of life which serves as the basis for all rules. In fact, the greatest divine purpose of all is to establish justice in society. Information and cyberspace technology due to their flexibility, no centrality, constant alertness and programmability and their systematic nature are capable of establishing justice and taking all the members of society and citizens into account.

Justice orientation is considered the most significant capacity of the cyberspace because all its information and services can be provided to all citizens without any discrimination. This capacity directly refers to the logic of development of urban accessibility; a logic in which all individuals enjoy the same equal opportunities. This feature, to some extent, surmounts the boundaries and physical limitations, negates the concept of a physical city and emancipates citizens from the physical dominance of urban life wherein a group is confined to the lower areas of the city, a group to the center and another group to the upper parts.

Unlike the physical city, in the virtual city services are provided to the citizens indirectly, which prevents from interference and imposing personal preferences and prejudices and social corruption. In fact, virtual city provides all its capacity equally to citizens; what is impossible, or at least very difficult, to achieve in the physical environment.

In this respect, identifying the discriminations as well as the weak points of the physical environment and using the capacities of the cyberspace for eliminating them can be really helpful. However, cyberspace requires software, plan and a justice oriented system: otherwise injustice and corruption can also become a social agenda. In fact, information systems provide services to the citizens without being affected by mental biases and ethnic, racial, class, religious, sexual,... discriminations. Cyberspace is also an ideal environment for responding to the needs of the visually impaired, invalids and the elderly. At the moment, many of these individuals are not able to use facilities of the physical environment or at least, using these facilities is very difficult for them due to numerous problems such as heavy traffic in populated cities.

Cyberspace is a new area for offering services to these neglected segments of society, such that by providing especial facilities and services for these segments, the shortcomings of the physical
environment may be removed. To this end, in designing Tehran virtual city project, the needs of these individuals have been particularly considered, a measure which has been in line with the need for justice orientation in designing and constructing Tehran virtual city.

Therefore, apart from recognizing and understanding various dimensions and causes of corruption, authorities and managers at any level (national or local) and any position (governmental, municipal, etc.) need a more holistic, systematic and process-oriented (process of prevention, control and combating corruption) approach to fighting corruption so that they may abandon reductionist and limited approaches such as panoptic prison, etc. This requires an in-depth understanding of corruption, not its consequences. In order to confront bureaucratic corruption, we must use not only management techniques but also institutional and underlying development strategies at various micro (individual), macro (group, organizational, inter-organizational, national and international) and process levels. Thus, information technology plays a potential role in controlling corruption, but it is a limited role which is part of a much more holistic and systematic approach. But of course, national and local governments can use information technology as the source of data and bureaucratic automation and also for computerizing the operations or at a higher level, they can use intelligent information systems based on artificial intelligence technologies, … with functions similar to human mind- along with other cultural, political, social, … strategies.

3. Methodology

3.1. Research method and validity of its tools
Considering the use of combined tools (interview and questionnaire), in regard to data collection method, this research is a combined research (quantitative and qualitative), with regard to strategy, it is a descriptive, survey and correlation research and it is both a case study and a qualitative research using the theory derived from the data and in regard to nature, it is a fundamental and applied research.

Generally speaking, the methodology of the research is combined or mixed (quantitative and qualitative) and in the sections related to methodology (data collection, tools, method, etc.) a mixed scheme has been employed. The underlying logic for using qualitative and mixed methods in management research is their being complex and underlying and other unique variables which encourages the researchers to use research methods with an interpretive approach in order to explain the how’s and whys of the events (Douglas, 2003 as quoted by Hummer, 2005).

In the qualitative part of the research, by visiting the experts and beneficiaries interested in participating in the interview, 50 of the municipality beneficiaries including the employees, citizens, contractors and members of monitoring systems were interviewed and the lived experience of the municipality beneficiaries was analyzed and interpreted according to the conditions and issues of municipalities and by using the systematic approach of the theory derived from the data.

The strong point of this thesis is using a combined method in selecting research tools. In spite of showing apparent validity, the tool of interview was observed by university professors and some of the experts in the field of this research and accordingly, it could be claimed that the measurement tool has substantive validity (Adel Azar, 2008). In order to assess reliability of the questionnaire Cronbach’s alpha was used for a sample of 20 subjects for which a Cronbach’s alpha of 90% was obtained that suggests high reliability of the questionnaire.

3.2. Research objectives
This research includes two types of major and minor aims. The main aim is studying strategies for preventing, fighting and reducing bureaucratic corruption and the minor aim comprises of a study of the nature of financial and bureaucratic corruption including the level and types of financial and bureaucratic corruption at municipalities, a study of the nature of information and communications technology including the level and types of information and communications technology, causes of financial and bureaucratic corruption and raising awareness about financial and bureaucratic corruption.

3.3. Hypotheses
The qualitative part of this research included no hypotheses and was conducted as an exploration. However, in the quantitative part, the hypotheses were as follows:
Major hypothesis: There is a negative and significant relationship between using information and communications technology and financial and bureaucratic corruption.

Minor hypotheses:
- There is a negative and significant relationship between increase of information transparency and financial corruption.
- There is a negative and significant relationship between improvement and acceleration of accountability and financial corruption.
• There is a negative and significant relationship between improvement of employee and client communications and financial corruption.
• There is a negative and significant relationship between raising clients’ awareness about rules and regulations and financial corruption.

3.4. Statistical population, sample and sampling method
Statistical population of this study comprises of employees and beneficiaries of municipalities or those associated with municipalities including contractors, citizens, and district council members. In regard to the structure of the population, in the quantitative part, stratified random sampling method was used. The total statistical population in the group of municipality employees was 610 and 200 in the group of citizens who on average visited the four district municipalities on a daily basis. Using the sampling method, 210 of the municipality employees and 200 of the citizens of these districts were selected as the statistical population. Then questionnaires were distributed among them and eventually, 318 questionnaires were collected. But in the qualitative section, 50 of the municipality beneficiaries including the employees, citizens, contractors and members of monitoring systems were interviewed and the lived experience of the municipality beneficiaries was analyzed and interpreted according to the conditions and issues of municipalities and by using the systematic approach of the theory derived from the data. In the qualitative part, targeted and theoretical sampling was conducted.

4. Data analysis
In the quantitative section, SPSS software was used. Regarding the effect of information and communications technology, information transparency, accountability, awareness and communications between the employees and clients on financial corruption, Spearman’s correlation test was used and independent variables of bureaucratic-financial corruption and information and communications technology were tested and Friedman’s test was conducted for ranking the dimensions of information and communications technology (Adel Azar, 2006). And in the qualitative section, using grounded theory approach and the technique of content analysis of interviews and related documents, topics and topic networks were developed.

4.1. Study of research findings
Taking into consideration the information collected in this research, it was found out that majority of the respondents were men with the frequency of 62%. The highest frequency of respondents’ age was that of the group between 30 and 39 with the percentage of 38.2 and the age group of above 50 years with the percentage of 4.3 within the tested sample had the lowest frequency. However, this creates a suitable condition for this research because the respondents have been rather young and due to their education level, which will be discussed in the following lines, they have had updated knowledge of the subject which enhances reliability of the results. The information about education level of the respondents indicates that 41.2% of them had a high school diploma degree and 32.7% of them had a B.A. or B.S. degree; however, in the group of employees the highest level of education with 42.4% is that of those with a B.A. or B.S. and in the group of the beneficiaries the highest level of education with 41.5 is that of those with a high school diploma.

Zero hypotheses: There is not a negative and significant relationship between increase of information transparency and financial corruption.
First hypothesis: There is a negative and significant relationship between increase of information transparency and financial corruption.

Table 1: results of the correlation test for the first hypothesis

<table>
<thead>
<tr>
<th>Test result</th>
<th>Error</th>
<th>Significance number</th>
<th>Correlation</th>
<th>Sample group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>0/05</td>
<td>0/013</td>
<td>-0/256</td>
<td>Total of employees and beneficiaries</td>
</tr>
</tbody>
</table>

As seen in the above table, the obtained correlation coefficient equals – 0.256 and the observed significance number equals 0.013 which is lower than the significance level 0.05. Therefore, zero hypothesis is not confirmed. Thus, it can be concluded that there is a negative and significant relationship between increase of information transparency and financial corruption. Accordingly, other hypotheses were tested, the results of which can be seen in the below table.
Table 2: the results of minor research hypotheses

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Significance number</th>
<th>Correlation coefficient</th>
<th>Test result</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a negative and significant relationship between increase of information transparency and financial corruption.</td>
<td>0/013</td>
<td>-0/256</td>
<td>Confirmed</td>
</tr>
<tr>
<td>There is a negative and significant relationship between improvement and acceleration of accountability and financial corruption.</td>
<td>0/046</td>
<td>-/239</td>
<td>Confirmed</td>
</tr>
<tr>
<td>There is a negative and significant relationship between improvement of employee and client communications and financial corruption.</td>
<td>0/037</td>
<td>-0/228</td>
<td>Confirmed</td>
</tr>
<tr>
<td>There is a negative and significant relationship between raising clients’ awareness about rules and regulations and financial corruption.</td>
<td>0/022</td>
<td>-0/291</td>
<td>Confirmed</td>
</tr>
</tbody>
</table>

It is observed that among the minor research hypotheses, raising the clients’ awareness has the highest correlation with level of using information and communications technology and next to it are transparency and accountability and finally improving communications. Accordingly, major research hypothesis is presented, which will be confirmed.

In this section, it is claimed that average bureaucratic-financial corruption among employees and beneficiaries is not equal. In order to examine this claim we must consider the following:

\[ H_0 : \mu_0 = \mu_1 \]
\[ H_1 : \mu_0 \neq \mu_1 \]

Zero hypotheses: average bureaucratic-financial corruption among employees and beneficiaries is equal.

Hypothesis one: average bureaucratic-financial corruption among employees and beneficiaries is not equal.

First, we perform variance equality test for the two populations and then we present the results of average equality test for the two populations for both cases of equality and inequality of variance. Statistical hypotheses corresponding to variance equality test for the two populations are as follows:

\[ H_0 : \sigma_0^2 = \sigma_1^2 \]
\[ H_1 : \sigma_0^2 \neq \sigma_1^2 \]

Table 3: results of independent variables test

<table>
<thead>
<tr>
<th>Upper limit</th>
<th>Lower limit</th>
<th>Significance number of the average equality test for the two populations</th>
<th>Error level</th>
<th>Significance number of the variance equality test for the two populations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/112</td>
<td>-2/448</td>
<td>0/032</td>
<td>0/05</td>
<td>0/002</td>
</tr>
<tr>
<td>-0/041</td>
<td>-0/519</td>
<td>0/043</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Significance number related to variance equality test for the two populations equals 0.002 and is smaller than 0.05. Therefore, the hypothesis of equality of variances is rejected. Therefore, we examine the information on the second row in order to draw a conclusion about the average. The significance number of the average equality test for the two populations, given the inequality of variance, is 0.032 and is smaller than 0.05. Thus, the hypothesis of equality of averages for the two populations is rejected and the claim of inequality of corruption average form the viewpoint of the two groups of employees and beneficiaries is confirmed. Confidence interval for average difference from the viewpoint of the two groups is as follows:

\[-0/112 \leq \mu_0 - \mu_1 \leq -2/448\]
From inequality of averages of the two populations according to the two groups of respondents (employees and beneficiaries), it can be concluded that being an employee or a beneficiary affects the variable of corruption. In this section, it is claimed that average of information and communications technology for employees and beneficiaries are not equal. In order to examine this claim we must consider the following:

\[ H_0 : \mu_0 = \mu_1 \]

\[ H_1 : \mu_0 \neq \mu_1 \]

Zero hypothesis: average of information and communications technology for employees and beneficiaries are equal.

Hypothesis one: average of information and communications technology for employees and beneficiaries are not equal.

First, we perform variance equality test for the two populations and then we present the results of average equality test for the two populations for both cases of equality and inequality of variance. Statistical hypotheses corresponding to variance equality test for the two populations are as follows:

\[ H_0 : \sigma_0^2 = \sigma_1^2 \]

\[ H_1 : \sigma_0^2 \neq \sigma_1^2 \]

Table 4: results of independent variables test

<table>
<thead>
<tr>
<th>Upper limit</th>
<th>Lower limit</th>
<th>Significance number of the average equality test for the two populations</th>
<th>Error level</th>
<th>Significance number of the variance equality test for the two populations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/361</td>
<td>-1/661</td>
<td>0/732</td>
<td>0/05</td>
<td>0/298</td>
</tr>
<tr>
<td>2/407</td>
<td>-1/707</td>
<td>0/738</td>
<td>0/05</td>
<td>0/298</td>
</tr>
</tbody>
</table>

to variance equality test for the two populations equals 0.298 and is larger than 0.05. Therefore, the hypothesis of equality of variances is confirmed. Therefore, we examine the information on the first row in order to draw a conclusion about the average. The significance number of the average equality test for the two populations is 0.738 and is larger than 0.05. Thus, the hypothesis of equality of averages for the two populations is confirmed. From equality of averages for the two populations according to the two groups (employees and beneficiaries) it can be concluded that being an employee or a beneficiary does not affect the variable of information and communications technology.

In order to study equality of significance of variables of transparency, accountability, communications and awareness Friedman’s test is used. Our hypotheses are as follows:

Zero hypotheses: significance of information and communications technology indices are the same.

Opposite hypothesis: at least two indices have a different significance.

Table 5: significance of the indices

<table>
<thead>
<tr>
<th>Indices</th>
<th>Average importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency</td>
<td>1/35</td>
</tr>
<tr>
<td>Accountability</td>
<td>2/19</td>
</tr>
<tr>
<td>Communications</td>
<td>2/63</td>
</tr>
<tr>
<td>Awareness</td>
<td>3/83</td>
</tr>
</tbody>
</table>

Table 6: Friedman’s test

<table>
<thead>
<tr>
<th>Test result</th>
<th>Error</th>
<th>Significance number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed</td>
<td>0/05</td>
<td>0/000</td>
</tr>
</tbody>
</table>

Since the significance number is smaller than 0.05, this test rejects the zero hypothesis. The opposite hypothesis is confirmed and at least two of the indices have a different significance. Any other conclusion would be descriptive. Significance of awareness index is more than communications, accountability and transparency respectively.

Results obtained from the qualitative method and content analysis of the interviews wherein the respondents answered researcher’s questions about existence or nonexistence of financial and bureaucratic corruption, grounds...
for corruption, reasons for committing it and ways to prevent and fight it with an emphasis on information and communications technology, are as follows:

The results of these interviews have been divided into three main categories: 1- grounds for financial and bureaucratic corruption, 2- reasons for committing financial and bureaucratic corruption and 3- ways to prevent and fight financial and bureaucratic corruption with emphasis on information and communications technology. Regarding the grounds for corruption, the respondents referred to the opportunities and contexts for corruption and unanimously stressed those activities where the employee and client have a face-to-face relationship, that is; through a close and prolonged face-to-face contact between the employee and the client, preliminary conditions for committing corruption in the financial and bureaucratic areas are created. One of these areas, and of course the most important of all according to the respondents, is the issue of receiving municipality taxes. Other, instances referred to by the respondents include disclosure of secrets and confidential documents, issuance of traffic label and delaying legal procedures required by the client.

The respondents consider the following to be the reasons for committing corruption:

- Weakness of piety, self-knowledge and theology in individuals
- Insufficient income of the person who commits corruption and lack of balance between the income and expenses of this person
- Insufficient and unformulated of employees’ performance
- The judicial system’s lack of independence in investigating such crimes

4.2. The respondents recommended the following measures for preventing and fighting corruption

- Mechanization and automation of services and operations
- Creating an accessible and online city (mobile, …)
- Strengthening transparency and its priority in municipalities
- Electronization of all the activities of government and municipalities as well as the entire inter-sectional and inter-organizational interactions
- Establishment and development of necessary infrastructures (electronic, legal, technical, cultural, intersectional cooperation, preparation of the public, formulation of legislations, etc.) for E-city
- Realization of E-city and E-government
- Reducing human intervention (automation, …) and systemization of activities and detaching them from personal preferences and human intervention
- Establishing contractor selection system and reducing human resources intervention
- Propagating and encouraging the culture of receiving electronic services- rewards and prizes, etc.
- Build trust among the citizens for using electronic services
- Education, which plays a major role in reducing bureaucratic corruption. The respondents have mentioned municipalities as organizations that in most countries are accused of financial-bureaucratic fraud and abuse and stated that one of the strategies for preventing financial abuse is developing facilities and requirements in a way that auditing and financial reporting are performed up to two times a year.
- By using information and communications technology at municipalities in a country, opportunities and grounds for committing corruption are reduced

Measures taken by municipalities for preventing and fighting corruption are:

- Using electronic payment for paying municipality taxes and also other financial affairs, launching intelligent data transfer systems which operate as a network and using internet and intranet for doing intra-municipality and inter-organizational tasks
- Launching urban management network controlled by 137 telephone and internet system, 1888 public monitoring system and electronic registration and follow up of municipality tenders, etc.

According to the interviewees, these strategies increase information transparency for the citizens, accountability of municipality towards citizens in all areas, accountability of the employees within the organization, municipality-client communications, municipality employees’ and citizens’ awareness about rules and regulations. These strategies also reduce citizens’ visits to municipalities, which leads to reduction of face-to-face contacts and inner-city commuting and increases the possibility of accurate and comprehensive supervision of the performance of the employees, citizens,
etc. - that according to the interviewees leads to a considerable reduction in occurrence of financial and bureaucratic corruption at municipalities. Also based on the results of this research, by enhancing the four dimensions of information transparency, accountability, communications and awareness about rules and regulations, financial corruption is decreased and, as observed, the overall views of the interviewees also confirms this issue.

5. Discussions and conclusion

Bureaucratic corruption has various types and forms such as receiving money and other rewards for signing a contract, violating instructions for gaining personal interest, employing friends and relatives, violating rules and regulations, etc. and is a pervasive, multidimensional, complex and diversified phenomenon which is formed secretly at various levels and due to different causes and has numerous destructive consequences for governments and bureaucratic systems.

Therefore, considering the above-mentioned characteristics of corruption, simply adopting a particular, limited approach cannot prevent it and, apart from recognizing and understanding various dimensions and causes of corruption, authorities and managers at any level (national or local) and any position (governmental, municipal, etc.) need a more holistic, systematic and process-oriented (process of prevention, control and combating corruption) approach to fighting corruption so that they may abandon reductionist and limited approaches such as panoptic prison, etc. This requires an in-depth understanding of corruption, not its consequences. In order to confront bureaucratic corruption, we must use not only management techniques but also institutional and underlying development strategies with emphasis on up-to-date and advanced autonomous information technologies simulating human mind which fight corruption effectively and efficiently at various micro (individual) and macro (group, organizational, inter-organizational, national and international) levels by adopting a cooperation approach (participated by all municipality beneficiaries). Providing better services to the citizens, improving interaction between governmental organizations and departments and the clients, giving authority to citizens through access to information and more efficient management of government are among the aims of establishing such a government. Among the outcomes and advantages of establishing such a process are more transparency in affairs, enhancement of sense of responsibility, constant improvement of procedures and processes, more convenience, growth of resources and reduction of cost of services, reengineering of common processes and methods within the bureaucratic system and governmental organizations and consequently promoting bureaucratic health and fighting corruption.

In order to answer the major research question, the results of the four dimensions of this study can be summarized as: using information and communications technology in the form of information systems can lead to reduction of financial corruption through enhancing transparency, accountability, provision of information and improving communications.

6. Recommendations

Since increasing transparency leads to a decrease in financial corruption, in order to increase transparency municipalities can use required infrastructures and for improving their condition, especially in the competitive environment facing these organizations, plan and invest on complete realization of E-government and city as well as information transparency. In order to reach a suitable level in accountability, apart from using information and communications technology, municipalities can use other mechanisms.

- In order to improve communications, information and communications technology infrastructures can be really helpful and for enhancing the quality of this dimension, municipalities can make use of the experiences of other countries. Through a targeted planning with emphasis on removing the problems facing realization of E-government, municipalities can take a great step in raising clients’ awareness.
- Revision and upgrading of the law of holding tenders and legal emphasis on holding all procedures of tenders by using information technology and accelerating review and approval of the bill of amending the law of holding tenders.
- Formulating the law of news agencies, press and electronic publications and internet information sites (revision of the amendment to Article 1 of Press Law, 2001)
- Studying the laws and regulations regarding financial corruption in Iran indicates that preventing and fighting financial and bureaucratic corruption is of utmost significance. On the other hand, the fundamental approach of
the general policies of the Twenty-year Outlook Document is progress and justice and one of its main headings is being active, responsible, selfless, faithful, content, conscientious at work, disciplined and having the spirit of cooperation and social compatibility. Also the general policies of the fifth program of economic, social and cultural development of the Islamic Republic of Iran emphasizes enhancement of information transparency for citizens in all activities, accountability of the authorities from senior levels to government employees towards citizens, useful, effective and comprehensive communications between authorities and citizens and citizens’ comprehensive, accurate and timely awareness of governmental rules, regulations and news and eventually, using information and communications technology in all governmental activities.

References:
28- Edwin, c, cierpial jr. (2006). "study on military corruption and corruptin perception level, focus on the empirical analysis of 8th u.s. army soldiers". department of public administration graduate of soongsil university.
30- Jo. T. Quah,(2001). " globalization and corruption control in asian countries". N. S.
38- Ramasooota, p.,"Information Technology and bureaucratic Surveillance", ,"Information Technology for development 8(1)


44- William A. Clark. (2010) "Comparative anti corruption policy : the American, soviet and Russian cases”


48- Towards a unified approach”. Prepared for the IV Global Forum on Fighting Corruption, Brasilia, Brasil, 7-10 June 2005