

# National Information and Communication Technology Policy in Yemen: The Response of Security Sector for Decision-Making

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**Abstract**—There is an increasing worldwide interest on the use of information and communication technology (ICT) in governmental and private sectors to support decision-making process in several aspects such as economic, educational and security. The Yemeni government is interesting in adopting and developing national policies to take advantage of ICT applications. This study aims to review the national policy of applying ICT systems in Yemen, particularly in security sector, and to reveal how the policies and potentials, which used by the ministry of interior in Yemen are supporting the decision-making process. Furthermore, this paper addresses the ICT Policy implications and provides some suggestions to ensure the maximum utilization of ICT systems and applications to support decision-making process in the Yemeni security sector.

**Index Terms**— Yemen, ICT, National ICT Policy, Decision-Making, Security sector

## I. INTRODUCTION

Recently, many countries worldwide adopted and included the ICT in their institutions, in both developed and developing countries, as a result of the changes in the different economic, social, political and security sectors. There is increasing need to provide information to support short-term and long-term decision making effectively and timely. However, traditional information systems became fewer adequacies in providing information to decision makers, due to the lack of an appropriate timely of information. Therefore, there is an urgent need for new adequate information and technology systems that able to provide high-quality information at the right time, contributing to the rationalization decisions in several fields, including security, educational, political, commercial, medical and social. As sciences, advanced and supply the community with latest inventions, the crime has tended to exploit these inventions and adapt it to suit its objectives. For this reason it is essential that upon the security apparatus had to keep pace with this modern development and to seek the all-new in the field of science and use it facing the crime.

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Therefore, it has become the main attributes of the security sector in a modern state are the uses of technology in all applications such as crime detection, traffic regulation, and field of communication. Information technology (Systems-Equipment), recently has primarily used instead of human in sorting, analyzing and processing the data and statistics for decision making. The security cameras and the television screens were used in traffic regulation to adjust the violation vehicles and helicopter in search and rescue operations and transport the injured in an accident or relief operations. Many GIS applications in the security sector that strengthening the work of strategic planning and urgent intervention in several fields and transport systems of photographs and fingerprints of persons and documents between police stations where this progress aided to identify criminals .

The Republic of Yemen as other many world countries has set national policies in order to get benefit from the vast potentials of information and communication. The Ministry of Interior and its security institutions in Yemen recently began to set plan to adopt the policy of ICT to get benefit of using the available ICT systems in order to develop prospective vision and strategic plan to establish standards of informatics systems which play key role in decision making to efficiently face and respond to challenges and crises.

This paper brings to attention the national ICT policy in Yemen, particularly in security sector, and reveals how the policies and potentials, which used by the ministry of interior in Yemen are supporting the decision-making process. Moreover, the response of the security sector in supporting the decision making is intensively analyzed.

The rest of the paper is organized as follows. The national ICT policies and strategies in Yemen are tackled in section II. Section III discusses the national policy for security sector and the decision support systems, while section IV concludes this work.

## II. THE NATIONAL ICT POLICIES AND STRATEGIS IN YEMEN

Most of the previous studies pointed that the ICTs have a vital role in making proper and effective decisions. In addition, ICTs timely provide the necessary information with less effort and cost, and orderly store this information for the time of need. Plans and informatics policies had different names vary from country to another. In general, it is known as "national information policy" which concerns with

determining the national level approach to develop ICT economic, social and security sector activities. For instance, Japan was the first country that set a national plan for information system in 1972 under the title of "information society plan" published by the Japanese Institute of Computer. This plan was supported by the Ministry of Industry and International Trade. The plan included an investment of about \$ 65 billion in IT projects during the period from 1972 to 1985 [1].

Although some countries such as United States, Malaysia and Hong Kong, are significantly technological advanced and achieve steady progress in some informatics domains, they do not have comprehensive national policies informatics plans and this due to the trend towards technology in those countries.

Generally, there are significant differences in the level of use for information and communications technology in the Middle East and North Africa regions (MENA). Whereas most of the Gulf Cooperation Council (GCC) countries have adopted plan to acquire ICT and began to benefit from its relative advantages. While North Africa countries and the lower Eastern countries (Levantine nations) still suffering from significant weaknesses that hinder their capability to fully spread the use of ICT to increase competitiveness, and accelerate the positive social impacts that are associated with technology [2].

As in other developing countries, Yemen seeks to achieve sustainable development using the available possible means such as information technology field facilities. Since the information technology sector is considered as a backbone for the national comprehensive development, it is highly necessary to tend to scientific and strategic planning to develop the informational sector to fulfill comprehensive development needs, and to contribute in developing the informational work performance for state institutions in addition to provide information services to the decision maker.

In fact, up to the beginning of 1990s Yemen did not have adequate National Information and Communication Infrastructure (NICI) plan and strategies. While A significant leap was made when the Yemen government established the National Information Centre (NIC) which is responsible for preparing, suggesting and following-up the implementation of information development policies in term of both applications and information content.

Although Yemen does not currently have a Computer emergency response team (CERT), it is now in the process of developing cyber security capabilities. In 2009 a new unit for electronic crime investigation has been established in the Ministry of Interior [3]. Therefore, NIC handles cyber security insofar, as it proposes new cyber security policies, ensures adherence to those policies and maintains backups of government systems that can aid the process of developing cyber security capabilities in Yemen [4].

During the period 2001-2014, the ICT sector has witnessed a series of efforts, policies, strategies and plans to adopt a number of initiatives and projects in the field of infrastructure, in order to promote the free flow and access

of information. In addition to getting benefited from the ICT facilities to build human capabilities and skills and set legal, legislative and regulatory frameworks. In general, national measurements and polices in the ICT sector and electronic applications that have been done by the Yemen government can be summarized as follows:

In the middle of 1990s NIC was established as a key institution in implementing the ICT polices and suggestions.

Although NIC was a major step in the Yemeni government's information strategy, the center still facing several obstacles and complications because the information sector application was quite recent. Furthermore, Yemen's socioeconomic conditions limit the ability of the center in taking national comprehensive duties.

In order to set up an institutional information framework and the main structure of information on the national level, in 2000 NIC adapted several information infrastructure projects such as Yemen's National Information Strategy (YNIS), the National Information Network (NIN), and the information institute. Consequently, several academia and social service projects were established such as Yemen's e-library, Society Service Centers. Furthermore NIC provides much other information services through publishing data and make it accessible to the governmental institutions and other users.

Under the National Information Policy and Strategy, NIC collaborated with different private and public institutions to adopt related national initiative and sectoral strategies in 2001. Based on that initiative, the National High Commission was established in order to elaborate sector-related policies and strategies. The center conducted the first field survey for Yemen's information situation, and accomplished preparing the national information policies and strategy documents in cooperation with the Economic and Social Commission for Western Asia (ESCWA) [5].

The NIC prepared technical and economic feasibility studies to build up the NIN, and this project was included in the five-year socioeconomic development plan in Yemen.

In 2003, the Ministry of Telecommunication and Information Technology was authorized to manage the technical aspect, in addition to developing the communication policies and offering and facilitating ICT services. The government included the IT strategy as a part of its strategy of sustaining integrated development plans in Yemen (2001-2005). Upon this strategic plan, in 2005 the ministry launched the national IT program initiative (E-government) [6]. In 2008 the Yemeni government created a new website in order to provide information about the duties, activities and service of the governmental bodies, private sector and civil society organizations. In March 2011, supporting with the ESCWA, the NIC in Yemen has successfully formulated and adopted its own national strategy.

The department of central statistic in the ministry of planning and international cooperation conducted essential step to collect data by adopting a national IT strategy which considers one of ICT aspects. Although Yemen has taken remarkable steps toward ICT development, it still faces

major challenges that slow down the progress of ICT sustainability in the country. These challenges related to the infrastructure and the economic status, in addition to the regulations and policy challenges. Many other problems have considerable influences such as bureaucracy and corruption

### III. THE NATIONAL POLICY FOR SECURITY SECTOR AND THE DECISION SUPPORT SYSTEMS

As response to national initiatives of information technology program, the Yemeni ministry of interior established special department for information management, known as the Information Center (IC). The IC objectives are to benefit from uses of information and communication technology in the security sector. Further, it contributes to achieving the national visions of the security aspect to promote the security performance at the institutional and national level. In addition to building up systems and bodies for the sake of decision-making support serves in long term vision.

Strategic objectives of national ICT policy for the utilization of information and communications technology in security sector follow as:

- 1) Contribute in improving the performance of the security sector to deliver services to the Yemeni community.
- 2) Moving towards implementation of the E-government project.
- 3) Develop the technical and human resources and ensure sustainable development.
- 4) Use the technology to enhance decision-making support service

Practically, the two objectives (3 and 4) of ICT would provide a constant base in improving sharing and delivery mechanism of the information. The implementation of those objectives to keep pace with governmental work performance requires the following tasks:

- 1) Provide and develop automated systems using modern techniques and benefit from technological developments to upgrade security performance and management level.
- 2) Modernize the infrastructure for automated systems and the integration of databases.
- 3) Promote the networks and information transmission lines.
- 4) Distribute the services geographically to cover large areas of the state in order to improve the level of service for the users.
- 5) Polarizing national qualified professional in the ICT sector and provide adequate training for the ministry's employees
- 6) Provide an advanced technology in the field of preservation of the documents and data cabling.
- 7) Keep up with rapid technological development and any new invention in information and computer technology field.

The Implementation of ICT in the security sector through providing accurate, complete, consistent, and timely information plays a key role in decision-making processes. Addressing the challenges which facing the Ministry of Interior to work on and implement of the above tasks on the

security sector consistent with the policy and program of government required to create technical information programs and modern communications systems. Thus, IC adopted its strategic vision to set up the following ICT systems [7].

#### A. Internal Network

It is a network located at the general command, department in the Ministry of Interior. This network contains all the programs and regulations that needed by employees to perform their daily work. It also used to achieve harmony and integration between security systems. The internal network is considered one of effective decision-making support tools that can accelerate analyzing and solving of urgent problems, and facilitate the timely information transmission between security sector bodies. Consequently, it improves the planning, control and monitoring processes at both the ministry level and the across security institutions. Furthermore, it promotes the interpersonal skills for the employees in order to keep them aware with newly ICT systems.

#### B. Security situation assessment Program

It is an electronic program has interface gives the decision maker information about the current security situation in the state. In case of any criminal notification being entered into the Electronic Consolidated Criminal System (ECCS), directing the program interface will be updated to inform the system user about all required information about criminal notification. The program also provides reports about the ratio of crimes relative to the population in every district area (police stations). In addition to that it supplies the user with a detailed report about the ratio of disturbing and non-disturbing crimes, and anonymous for each security patrol, which Support the decision maker to take the effective, right and timely short-term decision in the cases of disasters and crisis based on its available data.

#### C. Intelligent Applications:

It is an Electronic Intelligent programs that provides services without human intervention or relied upon on them at any stage of serving procedures. The IC aimed to apply these applications in procedures related to the police office services such as the ownership of vehicles license, traffic management, marital status, civil status and other services provided by police offices to the public.

#### D. Geographic Information Systems (GIS):

GIS is used in several fields such as geopolitical, military and police and security sectors in governmental institutions in such application that related to the study of administrative and electoral divisions. GIS practically became an urgent need owing to its increased importance in security sector. There are many GIS applications in security filed that support strategic planning process and immediate, timely intervention in areas of crises. GIS also could be used in modeling future performance for security sector by expecting and predicting the security risk indicators and level. Furthermore it used in many other applications such as, border management, management of immigration and refugees affair, rescue operations, coastal protection, the

special task units (police, security, army), and fire protection departments.

GIS is one of the decision support systems that have a wide range of applications in different activities and operations. Therefore, it should be used effectively as a tool to strengthen and support the security systems owing to its spatial capabilities which reflect an effective impact on the decision quality corresponded to a security event.

The decision-making process between the institutions of the security sector in Yemen has different component and aspects which make this process such complex and full of challenges. However, as mentioned above applying ICT in security sector has a remarkable influence on improving decision-making capabilities and accessibility means. To assess how the ICTs implementation impacts the decision-making process through evaluating the IC adapted program, the following question should be answered.

- **How** adequate is the policy for the integration of ICT in the security sector in Yemen for sound decisions making?
- **What** are the shortcomings of the national information and communication technology policy in the security sector in Yemen?
- **Are** some decisions to be taken based on the relevant data is unavailable?
- **What** is the suggestion to redefine and adjusted the national policy to meet the needs of the security system in Yemen?

The ministry of interior has taken tangible steps toward applying this policy in the security sector as response to national ICT policy. In 2007 the ministry established a network for the Department of Civil Status and Civil Registration distributed within its all branches. Moreover, it sets up the automatic release system in all provinces, and creates 48 stations to provide this service. On immigration and travelling management affair, networking of land, sea and air ports have been established as well [8].

Despite of that measurements to implement ICT policy in the security sector, there are many differences in the process of applying the ICT in Yemeni security sector, due to lack of adequate policy-making at the national level, which had a direct influence on the clarity of the vision at the institutional level. Applying ICT policy in the security sector required development of nationally relevant context software for security institutions. The national policy are interested in creating the software. However, on the other hand, it does not have much concern training aspects of the staff, which could be done through by developing the educational infrastructure (Colleges and schools) that belongs to security institutions. Furthermore, the need for integration of learning and application, and the need for developing professional programs of pre-service and serving for research, and evaluating the development of local context software are not adequately addressed.

Apart from that, there is an increased expansion at security institutions in the Yemeni ministry of the interior such as security, medical service, educational and academic institutions. This creates an urgent need for new ICT network in order to get complete, consistent, accurate, and timely information.

Decisions- making process very often depends on the judgment of officials and their experience in the related field of their positions. Thus, the decisions are taken without

official data and without proper analysis. Sometimes making decisions come with the lack of the precision and coordination between some of the relevant authorities, this increase the ratio of risk at security institutions.

Therefore, proper information technology systems are urgently needed in all security institutions. However, the use of these systems have some difficulty in being incompatible with the special interests such as, the effective support in decision-making on the long-term in the security sector. This process would speed up the solution of problems, and facilitate communication between decision-makers in security institutions. Furthermore, it increases the regulatory control and generates new evidence to the sound decision support.

Moreover, the senior managers and decision-makers at the top level of authority in the Ministry of interior have to identify trends more accurately and adopt a policy more comprehensive in the technical, human and material aspects for sound decisions that are able to respond to the requirements of the strategy in the short and long-term term. Consequently later it can achieve high degree of success in sound decision-making.

#### IV. CONCLUSION

ICT is a powerful tool to improve the quality of the decision making process through providing Decision Support Systems. The successful implementation of the national ICT policy on the security sector mainly relies on the realization about its importance and merits on the sector. Recently, Yemen began to adopt the National ICT Policy and started to implement it in different governmental and private sectors. However, the response of the security sector toward that policy was not strong enough and faced some challenges and obstacles. This is due to lack of adequate NICI plan and strategies related to the sector, which were negatively affected the process of making timely and rational decisions. Decision-making process in the Yemeni security sector, most often depends on personal judgment and experience of the officials, and that may lead to less quality decisions and results. Furthermore, the environment to apply the DSS is inadequate in terms of having computer hardware, human resources, databases, software and systems for supporting decision making. Necessary steps are required to be done by policy-makers and planners as well as other higher executive authorities, to popularizing and applying the ICT systems into not only security sector institutions but also socioeconomic levels. The realization about the importance of providing reliable, complete, accurate and timely information should be increased in order to promote the quality of the decision process in the Yemeni security sector.

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