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Information Technology and Managerial Innovation of the Central Agency for Information Technology in Kuwait

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Abstract- The purpose of this paper is to find out how the information technology affects managerial innovation in Central Agency for Information Technology in Kuwait. Four dimensions of information technology (hardware, software, databases, and networks) were selected to measure their impact on managerial innovation. Subjects were all employees working at Central Agency for Information Technology in Kuwait. Data was collected using a questionnaire. Relevant statistical methods were used to analyze items as well as testing hypotheses. The findings suggested a high level of information technology usage, with a first rank for hardware. The results also showed a moderate level of administrative innovation of Central Agency for Information Technology.

On the part of the impact of information technology on managerial innovation, the results concluded that there is a significant impact of three dimensions of information technology (hardware, databases, and networks) on managerial innovation of Central Agency for Information Technology in Kuwait. Hence, the study recommends encouragement of teams to generate new practical ideas, as well as establishing training programs for employees at different managerial levels with the aim of developing their capabilities and improve their effectiveness in information technology issues and advancements.

Keywords: *information technology, managerial innovation, central agency, kuwait.*

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Abstract- The purpose of this paper is to find out how the information technology affects managerial innovation in Central Agency for Information Technology in Kuwait. Four dimensions of information technology (hardware, software, databases, and networks) were selected to measure their impact on managerial innovation. Subjects were all employees working at Central Agency for Information Technology in Kuwait. Data was collected using a questionnaire. Relevant statistical methods were used to analyze items as well as testing hypotheses. The findings suggested a high level of information technology usage, with a first rank for hardware. The results also showed a moderate level of administrative innovation of Central Agency for Information Technology.

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I. Introduction

Today's business organizations face significant competition in the world due to the rapid developments and changes occurring in the world of information technology, and enforced organizations to cope with changes, and work to find the best ways and methods to ensure its survival and continuity, and increase their profits. The subject of information technology and innovation management of important topics which have received attention recently as organizations invest heavily in information technology to keep up with the constant changes in the work environment, and in line with market requirements (Al-Hawary & Hadad, 2016; Al-Nady et al., 2013).

In recent years, using of information technology tools has increased, that many organizations use remarkably information technology to enable staff and institutions enhance the efficiency and effectiveness of management performance, and develop their skills and behavior (Al-Hawary & Metabis, 2013). Which makes the use of information technology instrumental in bringing out managerial capabilities of individuals perceiving that this will offer the utilization of all the means and tools they need, and the potential for development and change in their organizations (Aldaihani & Bin Ali, 2018; Al-Otaibi, 2010; Aldaihani & Bin Ali, 2018).

AL-Qaisi (2004) decided that the technological race among the advanced industrial countries represents in essence one of many manifestations of the creative challenge of appropriate expression to the spirit of this age. Many scientists revealed that human do invention, creativity, and innovation, since Genesis creation to now, they have been most human civilizations throughout the ages and time cares for her sons and working on the development and increase their mental capacities in all areas (Jarwan, 2002).

Innovation is important in modern times because it reflects the real bridge of theoretical ideas of peoples to the creative process works, plus that innovation effective and practical test to measure excellence as it is easy to see and evaluate creators work (Al-Mshaqbeh, 2003).

Organizations started to pay attention to the human element, and work on this investment positively. As human societies are not up and evolve without there being creative and innovative in various fields, and who prepare basic pillars and columns in the humanitarian community (Al - Hawary et al., 2013; Al - Hawary & Haddad, 2016; Al-Hawary & Shdefat, 2016), working on the human production knowledge, develop, and recruit, and they represent hope in solving problems hindering the progress of human civilization (Al-Hawary, 2011), innovation has become urgent in all areas at present, and essential need for community including individuals and organizations to become able to keep up with the times (Al-Hawary & Alajmi, 2017), which is the nature of technical progress and the knowledge explosion, and

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many inventions and multiculturalism that try each of them to impose itself, on the other in a time of globalization, our live today characterized by complex and the problems that erupt every day, make innovation and creation the only solution that makes the individual and the community able to cope with the requirements of this era (Al-Mafraji, 2003).

As a result of rapid developments, organization has become necessary to support the traditional way of work, such as the use of paper to save the data and the use of large rooms for safekeeping modern technology using hardware and software, networks and databases, and due to the world is facing the development of technology in various fields, Where the use of information technology has become an important and widespread in all sectors. Where the use of information technology and its importance in all sectors led to great interest by researchers to the information technology role of keeping warm with rapid environmental changes, which requiring strategic direction from organizations managers and leaders to develop creative personnel and management teams as essential elements to organizational success (Al-Hawary et al., 2011; Al-Hawary & Nusair, 2017), add to that the evolution of the contemporary managerial symbolizes all the processes that lead to the development of capacity, it focuses on the future and cares about managers and staff development to do their best, where the use of information technology in enterprises and Government departments and private sector of modern requirements to match the work environment development in Kuwait, Due to the importance of modern technology at work, so different institutions should give particular importance to the concept of information technology and the willingness to apply them in governmental institutions and the private sector in Kuwait, including Central Agency for information technology.

This study represents a modest contribution to raise the scientific knowledge to address a vital and important topics, where it is expected to add to the Arabic management library's a contribution to forming the basis for future studies, and the results of this study are expected to contribute in helping decision makers to take the right decisions on the improvement of management innovation process at present, While highlighting the importance of information technology and their effect in meeting the needs of development, reflect the importance of this study in the variables that focused on identifying the impact of information technology on managerial innovation process, After having contributed to the rapid development in information technology and global convergence issue with managerial development as an ongoing process does not stop at a certain point, and also to try to identify the concept and importance of managerial innovation to contribute to strengthening managerial development and application of the results to be achieved in information technology, owing to the lack of studies that are looking at this sector.

II. Literature Review and Previous Study

a) *Information Technology*

Information technology is currently one of the most important components of infrastructure in economic and social development; Information technology becomes the dominant power of production elements in different economic and managerial activities. Information technology tools in organizations play a prominent role in this process as it is the main tool in data processing (Al-Hawary & Ismael, 2010).

Information technology, which includes computer systems physical components, software and communications including distance communications and networks, has become one of the most important ways to organize competitive business organizations at this time. So you could argue that knowledge and technological property became stronger than financial assets. Who possesses the knowledge and technology have been able to develop services, products, and marketing services, cost reduction and increase quality in an environment with increased global competition (Kandilgi, 2007: 20).

Information technology plays an important role in communities at the level of individuals, groups or organizations, including from prominent and important positive role on the organization's performance of improving quality, and increase in speed and improve performance efficiency and effectiveness (Abduljawad, 2005: 2). Based on the above, information technology has become an important phenomena in the community as from the results of the interaction between man and society. At this time the world has become a small village where shortened dimensions of time and space.

i *The concept of information technology*

Many studies and research discussed the concept of information technology; there was not a specific concept or definition of the information technology. So that the word technology divides into two parts first (Techno) skill or craft (logy) science or art. Therefore this term means technical skill organizing. The concept of technology associated with industries over a period before entering the education world. The word technology was adapted to techniques and learned skills or study skills art logically to perform a particular function. Golbraith (2008) defines it as the theoretical application of scientific knowledge in the practical purposes. When computer and communications technologies are together, the result become information technology (Khalaf, 2007), and it is a general term that describes any technology that helps produce information processing, storage, and dissemination.

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Senn (2000) defined it as a broad range of capabilities and components for various elements used in storing, processing and dissemination of information, in addition to its role in producing and creating knowledge. Kochikar & Suresh (2005) Defined it as a technology used to create, store, Exchange, and use information in various forms (business data, voice conversation, fixed and mobile sources, multiple media presentations and other formats (Kochikar & Suresh, 2005). The essence of information technology definition returns to that the information technology associated with the hardware and software used in the production, processing, storage and transmission of information (National Audit Office, 2006).

Oyewole (2008) defined it as every form of technology used to create, store, Exchange, and use information in various forms (business data, animations and voice conversations and multimedia presentations and other forms of technology), they include a wide range of equipment and basic applications and services dealing with information.

Often referred to information technology (ICT) or information and communication technology, ICT have radically changed business organizations around the world, and information technology has many forms, perhaps the most important described as containing many e-business activities usually (B2B) or between a business and a consumer (B2C) (Jeon et al., 2006).

The process of using technology to make the commercial transactions called (e-business or e-commerce) and this contain these techniques on networks linking business organizations and consumer across supply chains and these technologies promote information sharing between corporate partners and consumers (de Klerk & Kroon,2005). However, the adoption of electronic commerce, share information, and business processes by relying on technological solutions enable organizations to strategically use technology to gain a competitive advantage (La Pierre & Medeiros, 2006).

ii *Information Technology Infrastructure*

There is no research agree of infrastructure definition in the literature, some researchers enter human assets within their definition of information technology infrastructure concept (Byrd et al., 2006; Lewis and Byrd, 2003; Broadbent et al., 1999). While others did not enter human assets within their definitions for information technology infrastructure (Laudon and Laudon, 2007), Broadbent et al. (1999) defined it as the basis for human and technological assets that are shared across organizations to form reliable services which are usually coordinated by a special section of information systems. Lewis and Byrd (2003) defined it as sources of information and technology that consists of hardware, operating systems , network technologies, databases and business applications, and core human competencies which provide the basis to allow information to flow between organizations freely, It also provides a basis for the design and application of current and future information systems support, it also supports innovation and innovation in the organization, Based on this definition which (Byrd) considered information technology infrastructure, that information and technology resources shared to be this infrastructure, where it meets the hardware, software, communication techniques, database applications, basic software and expertise, skills, and knowledge in order to configure the typical information technology services for the organization (Byrd et al., 2003). Regardless of whether or not human assets existed in the definition of information technology, human assets required to manage and apply information technology infrastructure sources by specialists in this area through experience and knowledge, even with a motorized elements of infrastructure (Chanopas et al., 2006).

According to Bhatt (2000) that the primary goal of the information technology infrastructure is to offer constant informational support across the Organization to respond to the markets challenges, Therefore the organizations goal must be to apply information technology infrastructure if this application held the organizations would get the flexibility to respond appropriately to both current and future market changes, He also stressed that flexibility is an important source of value, and that the infrastructure of information technology in organizations should be able to accommodate changes efficiently and effectively when the business need to adjust their strategies for working with time and other stressors.

Information technology infrastructure library is a collection of the best guidelines for information technology services management, and consists of a series of the best publications of best practices that provide guidance on information technology services and their quality, and provides guidance on the processes and facilities needed to support best practices, The definition of the information technology infrastructure library does not include human assets, and in general it infrastructure consists of seven main sources: Computer platforms, operating system platforms, applications, other information technology software, database management, storage of equipment, network services, telecommunications, internal platforms, integration and consulting services, And must be coordination among these elements through information technology specialists to provide interconnected infrastructure to support information technology services (Laudon & Laudon, 2010).

iii *Information Technology Components*

Databases: A collection of information or linked data associated with each other, and have a reciprocal relationship between them, and are stored in an orderly

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and non-repetition, The main characteristic of this information to its independence from programs that you use a bit of flexibility in the development and restructuring until the prescription of the system, Examples are the registration system and may include example set of records, records of nurses in the hospital, records of teachers and students, and managers of this data system called database management system (Qteishat, 1999).

As defined by Laudon and Laudon (2006: 233) databases is a collection of organized data in a way that many applications used through centralization of data and reduce duplicates with efficiency, instead of storing this data in different files and separate application separately for each of them, so that this data appears to users and meet their needs, and be stored in one place, and the database will be available to provide many applications and services.

Networks: It is a system that connects people, organizations and departments to share information sources (Daft, 2000: 672). Also networks known as communications system which allows using different software applications to work together, and you can use these applications from any individual as using Internet browsers, you can turn this data without human intervention such as browse information on the World Wide Web (Internet) (Raymond, 2009: 35).

Networks Enables participating code (Soft Ware), where a large program can be used by a group of users, such as using a database in an organization and use a set of partitions in the enterprise, thus fulfilling a set of benefits through such participation as a time saving in the process of downloading various software and purchase one copy licensed for this institution, providing storage space on computer disks, as well as the benefits they provide participating in networks within the enterprise resources such as printers and storage units, contributing Reducing costs for users, and share information and files and ensure compatibility with devices.

Devices: Hardware is the physical aspect in information technology and computers and associated peripherals, and contains four major units: these units are input units which is about ways and means by which the data is inserted into the computer like keyboard and optical pen mouse, microphone, scanner, digital cameras touch screen, And also the CPU is one of the most important units and is the beating heart in hardware and is responsible for controlling the computer parts and computer system It also contains a set of units, including control unit it is responsible for control and monitoring of all computer parts and works to transfer data to and from all parts of the computer through its reliance on main memory existing programs. Calculation and logic unit this unit is responsible for mathematical operations (addition, subtraction, multiplication and Division), and responsible for logical operations such as comparing and relating to decide and evaluate attitudes, As well as stereos and memory locations used to store data temporarily to use of judgment and logic unit. The third of these main units are supporting storage is responsible for storing data permanently to be referenced when needed, such as magnetic disks and hard drive, And most of these units is the output unit it is the means through which the data show finally form such as printers and plotters and speakers and screen where digital data is converted to useful data (Al-Salmi, 2003: 116-124; Abdel Al Taee et al., 2008: 48.55).

Software: Software for information technology as the soul to the body, and is one of the most important components, which is about building software that controls the computer and orientation as operational procedures needed by individuals, Two main types include: System software and application software, system software is responsible for computer management and organizing work, and is a mediator between the user and the device. As application software, divided into two sections, special applications and serve a particular process within the system such as accounting software, and general applications which is about software which is used by most users of the system, such as Microsoft Office software (Al-Zoubi et al., 2007: 25).

With the development of information technology in software, a lot of organizations started to use the cloud storage that provides easy access to information about the organization or individual This service is a huge computer contain storage space so the user upload the personal data to be stored for browsing your files when needed so you are not in need of your personal computer so you can access your information and browsing through a Smartphone or computer. And it also features quick access to upload files and share these files with others and can be used in educational centers and enable us to make a backup copy of our data and can be referenced. On the contrary it cons access requires Internet and security concerns of a hack for this data, as there are many applications for this service (like Google, cloud I Drive, drive One) (Altlwati, 2014).

b) Managerial Innovation

Organizations realized the need to develop their business and invent creative methods to help the preference and the emergence before other counterparts (Al - Hawary, 2015), because of rapid changes and developments resulting from the information and communications technology revolutions and knowledge, The individual worker is important and essential in innovation process to what possesses intellectual and mental capacities which help organization in managerial innovation (Eid, 2008).

There are previous studies examined how developing innovation capacity of individuals to

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influence their innovation in the Organization (Yuan et al., 2005). And researched how communication and the team management style decides to appreciate the innovation that team owns (Lenders et al., 2003), how does innovation contribute in marketing programs and productivity (Andrews and Smith, 1996), and how it affects the innovation of individual environmental factors related to business and non-business works (Madjar et al., 2002). With the start of the phenomenon of innovation, has had effects on civilizations and cultures, renewed innovation and creative methods for producing and financing was a reason for the survival of the groups in the competition. (Bruland and Mowery, 2006).

Renewal is the essence of managerial innovation of organization including the information technology sector in all its forms and is considered a fertile environment and encouraging innovation, the changes experienced by organizations and complex developments it must interest and foster innovation within their environment and between employees, As managerial leadership has to encourage and develops innovation among personnel to deliver solutions to the problems and work on developing the concept of teamwork and participation in proposals and build new ideas for more creative processes to reach an increase in production, as scientists and researchers on how to promote leadership through innovation. According to Scott and Bruce (1994) talked about how the process of exchange between the leader and the individual through innovation, the study showed the presence of mutual quality between the leader and the individual and between the individual and the team leader and be positively linked through the behavior of the individual creator, through individual Commander theory could be personal and informal relationship or high quality relationship that is built on trust one another.

To meet consumer needs, wishes, and development in goods and services to the high standards of quality is what justifies the Organization's ability to keep going and survive, which makes them targets for viability (Kher Allah & Anes, 2009). And one of the most important factor of the growth and prosperity of the organizations is innovation, and thus growth and prosperity of society as a whole, so that it works to improve and renew products continuously to gain the competitive advantage (Sebban, 2005). Through continuous forecasting of development and changes helps innovation also address future changes with a high degree of efficiency and effectiveness.

i *The concept of managerial innovation*

There are many concepts and definitions dealing with innovation and innovation management, as authors and researchers interested in the business world on scientific level the concept of managerial innovation, Smith (2003) defines innovation as the process through which are interlinking things that never interdependence before, Al-Saleem (2002) notes that (Makenon) defines innovation as new ideas that lead to produce behavior characterized by seriousness and ability to evolve.

In recent decades, found the concept of innovation is a very important deal, where the concept became available to organizations that aim to develop, survive and maintain its competitive position (Chih-Yang et al., 2011), and Garica et al. (2008) Consider that the most important achievement of the competition between organizations is innovation, as Hurt et al. (1997) believed the ability of organizations to change their source of innovation, creative behaviors is one of the behaviors that indispensable for organizations in product development and competitive markets.

And with frequent and multiple definitions which discussed the term 'innovation', the word innovation returns to Latin 'innovation' which means to create something new (Verhess et al., 2004), As Schumpeter (2008) explained there are five areas where the company can offer through innovation: The generation of new products or improvement of existing products and providing new production processes and develop new markets for sales and developing new markets for supplying, reorganizing or restructuring of the company (Schumpeter, 2008), According to the World Bank's confirmation in '2006' that there are many small improvements and continuous improvements caused by innovation and these can be technical, managerial and institutional improvements (Eshetu Tefera, 2008). The Oxford Dictionary defines innovation as change what has been done by presenting new models and elements (Clive et al., 2008).

Innovation has been defined as the successful implementation of creative ideas that help the Organization to respond rapidly to market demands, and that create a competitive advantage for the Organization to other competitors (Segev, 2011). Innovation is known as the company's ability to provide new processes, products and services (Al - Hawary & Aldaihani, 2016). Cropley et al. (2011) defined innovation as a process of development and provide useful new ideas at the level of individuals, groups or Organization as a whole. Hirton (2004) believes that everyone has a preferred way of innovation and decision making.

Innovation is known as process aimed at improving efficiency and effectiveness, and achieves a competitive advantage by creating and developing new products or new operations and services (Ali et al., 2010). Innovation is seen as an important source of sustainable competitive advantage and because it leads to better products that increase value for customers, and help companies survive, and help its steady progress (Delgado Verde, 2011). Innovation is based on

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the familiar attributes or unprecedented new technology in delivering value to customers (Vercauteren, 2008).

From macro perspective, innovation known as the ability to find new idea to create a paradigm shift in science and technology and market structure, and from partial view, innovation known as the ability to find new idea to influence the company's current marketing resources, technological resources, skills, knowledge, and abilities, and strategy (Garcia & Calantone, 2002).

Managerial innovation known as that inherent talent as other hidden human talents, you need this talent to raise, refine and practice to be present when you need to solve problems or new production, and these individuals are characterized by fluency, flexibility, originality, insight and sensitivity to problems (Champion and star, 2011). Liao et al. (2008) defined managerial innovation as a set of actions and shapes and new regulatory policies that help the Organization to deal with the problems and challenges faced in the external environment, and managerial innovation is one of the important factors that help the Organization on the continued success, especially with markets and dynamic environments, It is a creative operational processes and planning, organization, attract employees and management, leadership and information flow.

ii *Elements of Managerial Innovation*

Originality: Originality known as the ability to find new and innovative solutions, the aim of this new solution is not to take traditional solutions and not to repeat what others do and discover original thoughts and stay away from conventional thinking and produce unconventional solutions in problem solving, originality also is dissatisfaction with reality and the individual's desire to create new things about what exists, and originality defined as innovative results provided in order to achieve the objective and decline the results and the consumed familiar solutions , and create new behavior corresponds to the desired goals (Al-Souror, 2002).

Originality is the underlying conditions of creative products and ideas usually are new, sudden and unexpected and sometimes be a bolt (Simonton, 2002). Oldham & Cummings (1996) proposes as creative behavior associated with employee performance and can be measured based on the fact that product or idea or a new procedure, genuine, it is relevant and useful.

Fluency: Fluency means the total which individual gives ideas and information at a certain time, as the person who referred to innovation and excellence is the number of ideas and information posed in front of a problem in a specific period. This means that the person has a high capacity to generate ideas, that fluency is the ability to produce a lot of ideas and solutions for a topic in a given period, and in verbal tests found that there are three distinct types of intellectual fluency this type of fluency relates to mental abilities like imagination, deduction, perception and analogy, sensation, and intuition, The second type is expressive fluency means ease constructing sentences, relational fluency and this one means complete relationships and this is what distinguishes it from intellectual fluency (Al-Faoury, 2005).

A person that can produce new ideas with large number compared with other people who enjoy the same circumstances surrounding suggested as creative person in his ideas of interest to the Organization in building action plans. Hence the individual differences between individuals are essential and important in launching a creative talent.

Flexibility: They are changes that occur in a certain kind of thinking and seeing the problem from several perspectives, as are changes in meaning or interpretation or understanding of the strategy or mission or a change that occurs in the direction of thinking that could give new goals interpretations (Al-Faoury, 2005). It is also a degree of ease with which a person changes his view or position on a certain topic, and looking at the subject from different distances to see others ordinary, think differently, and classification differs from normal classification, Flexibility was classified into two categories, one Adaptive major flexibility it means the ones ability to change the destination of his mind when he's in front of solutions to a problem, and another category is automatic flexibility means the ability of a person to give information automatically and doesn't come out of one (Al-Sorour, 2002).

Risk: It's the investment and absorb the energies and existing skills of the staff, and improve organizational climate within the organization, and understand the need for staff in the support and assistance to overcome their existing frequency to bear the consequences of this risk, forcing them to encourage employees by giving them incentives and rewards to encourage them to accept this risk, result and the consequent results (Al-Shammari, 2002).

Other studies have found that the desire to take the risk of internal and motivation are highlighted two features characteristic of person innovators across different fields (Amabile, 1983; Kim, 1990), The innovation is linked to a high level of risk, whether the organization is in the process of implementing a plan of creative new marketing plans or whether it's in the marketing of a new product in the market, here innovation is linked to competitive environment risks, innovation Also linked Resume internal risks stem from within the organization and usually the organization be aware of a great deal of these risks because they are within its borders, in contrast to that in the external risks that unknown for the organization in most cases because they are facing the Organization from more than one party (Khalid, 2007).

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The element of 'Risk Taking' coping in a fundamental dimension in the creative environment. As tolerance for ambiguity described risks. And also it allows risk-taking behavior in accelerating the decision-making even if they were available or could not be reached on all the relevant information (Ekvall, 1996).

Sensitivity to Problems: Are intended to recognize an individual or managerial sense or sense of having a specific problem or weakness, or need a particular aspect or situation at work or in the environment, and that there are individuals with the ability to sense problem or weakness than others in quick and exact observation, Because feeling the problem and discovered it is the first step in solving this problem, which is also linked to an individual's ability to notice errors or paranormal and recycle these things and raised questions about it (Jarwan, 2002).

In addition, Cattell (1971) considers innovation as the ability to solve problems and that multivariate phenomenon in itself, based on different cognitive characteristics and personality characteristics. Boden (2003) referred that innovation is the activity of problem solving. Without a solution of problems new things are irrelevant responses. Some argue that innovation is a form of finding problems and problems solving (Cskszentmihalyi, 1999). White and Smith (2001) indicate that 'convenience' must serve to problems solving that fit the needs of a given situation and accomplish objectives that can be distinguishing it.

c) *Information Technology and Innovation*

A Study of AL - Hawary and Ismael (2010), entitled ' the impact of using information technology to achieve competitive advantage strategies. The results indicated that the impact of ICT use in achieving cost leadership strategy and differentiation strategy and strategic focus at the level of significance ($\alpha \geq 0.05$). Hao (2011), a study entitled' the impact of technology on innovation and success in functional performance, aims to identify the impact of organizational creative success technology selection in Chinese companies. The results reached that choose technology has a direct negative impact on the success of innovation, technological choice positively reflected technical capacity and technical management on another hand, and on creative successful and organizational performance. Study of Chen & Tsou (2007) entitled' embracing information technology to create competitive advantage service applications: A case study of financial firms. The conclusions were suggested to adopt information technology has positive effects on creative applications on services, which increase corporate competitive advantage. Based on the above studies, the study hypotheses may be formulated as:

H1: Information Technology directly influences Managerial Innovation of the Central Agency for Information Technology in Kuwait.

More Specifically:

H1a: Hardware directly influences Managerial Innovation of the Central Agency for Information Technology in Kuwait.

H1b: Software directly influences Managerial Innovation of the Central Agency for Information Technology in Kuwait.

H1c: Databases directly influence Managerial Innovation of the Central Agency for Information Technology in Kuwait.

H1d: Networks directly influence Managerial Innovation of the Central Agency for Information Technology in Kuwait.

III. Research Framework

Based on study hypothesis, the following theoretical framework, shown in Figure 1. As can be seen from the framework, the study investigates the impact of Information Technology on Managerial Innovation of the Central Agency for Information Technology in Kuwait, where Information Technology are the independent variable and are positively related to Managerial Innovation as the dependent variable.

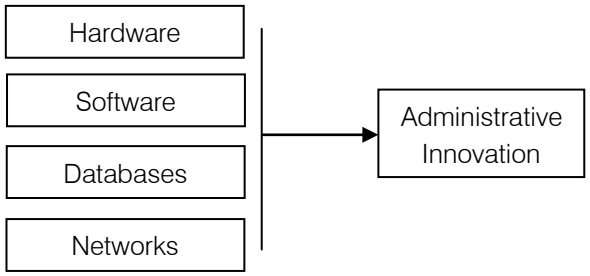

Figure 1: Theoretical Model

IV. Methodology

The methodology section of the current research depicts the sample of the study, the measurements, the statistical analysis to test the validity and reliability of the study tool and to test the study hypotheses employed to test the relationship between the study constructs (Information Technology and Managerial Innovation).

a) *Measures*

The constructs in this study were developed by using measurement scales adopted from prior studies. Modifications were made to the scale to fit the purpose of the study. All constructs were measured using five-point Likert scales with anchors strongly disagree (= 1) and strongly agree (= 5). All items were positively worded. Information Technology consists of Hardware, Software, Databases, and Networks were adapted

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from previous studies (Chen & Tsou, 2007; Al-Hawary & Ismael, 2010). Managerial Innovation consist of originality, fluency, flexibility, Tolerance of ambiguity, and problem sensitivity were adapted from previous studies (Deshpande´ et al., 1993).

b) Population

The study population consisted of the employees of the Central Agency for Information Technology in Kuwait, because the study population is small in number, the researchers considered all the employees (437). The unit of analysis of this study was the employees of the Central Agency for Information Technology in Kuwait. The questionnaires, with instructions of how to complete them, were distributed to respondents by an interviewer. Subjects were asked to assess their perceptions of various items of different constructs. Assessments were based on A Five-point Likert scale ranging from "strongly disagree (1) to "strongly agree (5) was used to measure the 40 items. To minimize possible response bias, instructions emphasized that the study focused only on their personal opinions. There was no right or wrong answers. After completion, the questionnaires were checked and collected by the interviewer. Table 1 shows the characteristics of the sample.

Table 1: Sample Characteristics

Variable		Frequency	%
Age Group	Less than 30	91	21
	30- less than 40	228	52
	40- less than 50	63	14.4
	50 years and more	55	12.6
Gender	Male	170	39
	Female	267	61
Educational Level	Diploma	137	31.3
	Bachelor	211	48.3
	Master	78	17.8
	Ph.D	11	2.5

c) Data Gathering

The research data was collected through the questionnaire. The questionnaire began with an introductory statement that asked respondents to administer their own responses, assured them of confidentiality, and so forth. This was followed by a request for demographic information and the measures. Data were collected through random questionnaires users. The study was based on the development and administration of a self-administered survey and conducted in Kuwait.

d) Reliability and validity of the survey instrument

The survey instrument with 40 items was developed based on two variables Information Technology as independent variables with four dimensions: Hardware (HA1 - HA5), Software (SO6-SO11), Databases (DA12-DA16), and Networks (NE17-NE21). Managerial Innovation as dependent variables with five dimensions: Originality (OR22-OR24), fluency (FL25-FL29), flexibility (FLE30-FLE33), Tolerance of ambiguity (TA34-TA37), and problem sensitivity (PS38-PS40).The instrument was evaluated for reliability and validity. Reliability refers to the instrument's ability to provide consistent results in repeated uses (Gatewood & Field, 1990). Validity refers to the degree to which the instrument measures the concept the researcher wants to measure (Bagozzi & Phillips, 1982).

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Table 2: Factor Analysis of Information Technology

Construct and Item	Loadings	Communalities	Eigen Value	Variance	Reliability
Hardware (HA)			3.426	68.951	.8861
Computers in work environment suit work requirements	.760	.872			
There is a sufficient number of computers available to provide appropriate information to make decisions	.577	.760			
Computers used as of large storage capacities	.724	.851			
Computers used are at high speeds	.727	.852			
Computers used are able to update	.660	.812			
Software (SO)			2.981	57.311	.8478
Software available in the Work center meet my needs	.731	.855			
software easily interact	.536	.732			
software are easy to be corrected and developed	.492	.701			
Software contribute to the development of a range of alternatives to solve the problem	.445	.667			
software used are protected against manipulation	.598	.773			
Software used provide guidelines and provide explanatory information in case of defect	.638	.799			
Databases (DA)			2.687	57.236	.7986
Databases contribute to the provision of information at a lower cost	.472	.687			
Databases contribute to save the vast amount of data	.599	.774			
Security and protection system for entry into the database within the powers conferred upon users is available	.670	.819			
Databases contribute to the exchange of information between various departments and divisions	.487	.698			
Database is updated on a regular basis	.632	.795			
Networks (NE)			3.159	53.924	.7819
Connecting internal departments of the Work center by a computer network contributes to the coordination between them and increase s their effectiveness	.420	.648			
Networks used are easy and fast	.546	.739			
Networks contribute to connect all units of the Work center to quickly report any error that occurs	.512	.716			
Networks contribute to connect all units of the Work center to monitor and control the course of daily operations	.600	.774			
Networks link all units of the Work center by one network with the main center.	.617	.786			

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Table 3: Factor Analysis of Managerial Innovation

Construct and Item	Loadings	Communalities	Eigen Value	Variance	Reliability
Originality (OR)			3.215	62.354	.6355
I apply new methods to solve the problems that I face at work	0.63	0.66			
I perform my work in sophisticated and new manner	0.67	0.71			
I am keen to put new suggestions and ideas	0.68	0.69			
Fluency (FL)			2.972	58.364	.8517
I possess multiple perspectives to complete tasks	0.55	0.58			
I have a power persuasion	0.58	0.63			
I am able to generate suitable ideas on a particular topic	0.63	0.66			
I enjoy great skill in debate and dialogue	0.64	0.67			
Interested in introducing new ways of working	0.61	0.62			
Flexibility (FLE)			3.015	60.325	.8341
I use various types of mechanisms of action in response to developments in the work environment	0.53	0.56			
I am keen to keep abreast of developments and technological changes in the work environment	0.58	0.63			
I am trying to get ideas and suggestions that contribute to solving the problems of work	0.55	0.58			
I am keen to take advantage of the criticisms and comments made by coworkers	0.52	0.54			
Tolerance of ambiguity (TA)			3.108	56.324	.8052
I propose new methods to perform the work, even if there was a probability of failure	0.52	0.55			
I have the courage to accomplish creative work and bear the consequences	0.59	0.62			
I am keen to embrace new ideas, even if I face some obstacles during application	0.55	0.59			
I work in a team dominated by the spirit of risk-taking	0.54	0.57			
Problem sensitivity (PS)			2.997	59.871	.7379
I feel pleasure and excitement in dealing with labor problems	0.65	0.71			
I possess an accurate view of work problems	0.60	0.64			
I expect to work problems before they occur	0.59	0.61			

Factor analysis and reliability analysis were used in order to determine the data reliability for the Information Technology and Managerial Innovation measures. A within factor, factor analysis was performed to assess convergent validity. The results of the factor analysis and reliability tests are presented in Table (2) and Table (3). All individual loadings were above the minimum of 0.5 recommended by Hair et al. (1998). For exploratory research, a Chronbach α greater than 0.70 is generally considerate reliable (Nunnally, 1978). Chronbach α statistics for the study contracts are shown in Table (2) and Table (3). Thus it can be concluded that the measures used in this study are valid and reliable. On the basis of Cattel (1966) and Hair et al. (1998) criterion, factors with eigen values greater than 1.0 and factor loadings that are equal to or greater than 0.50 were retained. 40 items, loading under four factors of Information Technology and five factors of Managerial Innovation.

V. Descriptive Statistics Analysis

Table (4) indicates that employees of the Central Agency for Information Technology in Kuwait evaluate Hardware (with the highest mean scores, i.e. M = 4.34, SD=0.73) to be the most dominant of Information Technology and evident to a considerable extent, followed by Software (M= 4.24, SD=0.683), Databases (M = 4.16, SD=0.721), and Networks (with the lowest mean scores M = 4.10, SD=0.696). With regard to Managerial Innovation employees of

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the Central Agency for Information Technology in Kuwait evaluate Originality (with the highest mean scores, i.e. M = 3.44, SD=0.829) to be the most dominant Managerial Innovation dimension within their company and evident to a considerable extent, followed by Flexibility (M= 3.39, SD=0.908), Fluency (M= 3.28, SD=0.914), Problem sensitivity (M= 3.25, SD=0.939), and Tolerance of ambiguity (with the lowest mean scores M = 3.10, SD=0.967).

Table 4: Descriptive analysis of Information Technology and Managerial Innovation

Dimension	Mean	Standard Deviation
Information Technology	4.21	
Hardware	4.34	.730
Software	4.24	.683
Databases	4.16	.721
Networks	4.10	.696
Administrative Innovation	3.29	
Originality	3.44	.829
Fluency	3.28	.914
Flexibility	3.39	.908
Tolerance of Ambiguity	3.10	.967
Problem Sensitivity	3.25	.939

VI. Test of Hypothesis

Multiple regression analysis was employed to test the hypotheses. It is a useful technique that can be used to analyze the relationship between a single dependent variable and several independent variables (Hair et al., 1998). In this model, Information Technology acts as the dependent variable and Managerial Innovation, as the independent variables. From the result as shown in Table (5), The regression model was statistically significant (F = 15.984; R2 = 0.167; P = .000). The R2 is 0.167, which means that 16.7 per cent of the variation in Managerial Innovation can be explained by Information Technology. The proposed model was adequate as the F-statistic = 15.984 was significant at the 5% level ($p < 0.05$). This indicates that the overall model was reasonable fit and there was a statistically significant association between Information Technology and Managerial Innovation.

Table (5) also shows that Hardware ($p<0,05$; ß=0.461), Databases ($p<0,05$; ß=0.362), and Networks (ß=0.323, $p< 0.05$), had a significant and positive effect on Managerial Innovation. This provides evidence to support H1a, H1c and H1d. Software ($p>0,05$; ß= 0.079) had insignificant effect on Managerial Innovation. This provides evidence not to support H1b. Based on the ß values Hardware has the highest impact on Managerial Innovation followed by Databases.

Table 5: Regression results between Information Technology and Managerial Innovation

Independent Variables	Standardized Beta	t	Sig.	Tolerance	VIF
Hardware	.461	4.401	.000	.239	4.190
Software	.079	.770	.442	.247	4.043
Databases	.362	3.006	.003	.181	5.525
Networks	.323	3.089	.002	.239	4.178

Notes: R 2 = 0.167; Adj. R 2 = 0.165; Sig. F = 0.000; F-value = 15.984; dependent variable, Administrative Innovation; $p < 0.05$

VII. Conclusions and Discussion

- The results of the study shows that there is a clear investment in information technology and technical components of (hardware, software, databases, and networks); Where there was more investment in hardware and least in networks and overall investment in these technologies was high in all fields and the researchers attribute the reason that Kuwaiti Government always striving toward development and keep up with developments in information technology, especially when talking about the Central Agency for information technology in Kuwait.
- With regard to Hardware, Kuwaiti Government have a strong trend towards investment in hardware and devices So always strive towards buying the necessary information technology for the Central Agency in Kuwait of adequate hardware in high speed and large storage capacity and the ability to update so this device has the ability to meet the needs of various ministries of State of the necessary information to perform its tasks and responsibilities towards society.
- With regard to Software, the Kuwaiti Government software has a strong trend towards investment in software by providing adaptive software and checks the possibility to interact easily and meet the work requirements, the information technology Central Agency in Kuwait is the government facility that supports various ministries and also this software has security protection from manipulation and unsafe access.
- With regard to Database, The Kuwaiti Government has a strong trend towards investment in databases by providing a secure database and is able to provide a wealth of information commensurate with information requirements of different ministries,

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especially that this agency bases to support the needs of the various State ministries of information which requires a strong investment in databases to meet the enormous information needs.

- With regard to Network, the Kuwaiti Government has a strong trend towards investment in networking to provide connectivity between departments and main departments on the one hand and the Central Agency for information technology and ministries on the another hand for the purpose of coordination and increased effectiveness between various parties and achieve the ease and speed of information transmission and avoid the error before they happen.
- Based on the answers of the study community members about the availability of managerial innovation and dimensions that cross a whole level of managerial innovation characterized by the Central Agency for information technology in Kuwait came upon those answers averages show that these items are available Representing both (originality, fluency, flexibility, risk, sensitivity to the problems) and moderately index and this indication of the service provided by the direction of beneficiaries. The highest was innovation in originality. Where the best and successful institutions are capable of innovation and innovation based on fully and sophisticated way so that best directors could help individuals and take advantage of creative talents.
- With regard to Originality, workers in information technology have an intermediate level of ability to adopt modern methods and techniques to solve problems they encounter in their daily work and business delivery method adaptive with developments achieved by daily updates in addition to contributing ideas fit with evolving requirements and recipients service
- With regard to Fluency, the workers at the Central Agency for Information Technology have an average level of ability to establish the tasks entrusted to them by their management in different ways and by virtue of the power of persuasion possessing strong argument that enabled them to debate and dialogue with great skill.
- With regard to Flexibility ,the workers at the Central Agency for Information Technology have an average level of ability to diversification in the use of the methods of work commensurate with the changes and developments that produced the work environment through their quest hard to get the ideas, suggestions and take advantage of the observations and constructive criticism received by the worker co-workers who enabled them and earned them the ability to meet the changing and renewable users of the Service needs.
- With regard to Risk, the workers of information technology Central Agency in Kuwait are cautious in risks taking, so they fear of taking responsibility for the consequences that might follow with labor and management accountability, in case of work damage and risks, It reflected on their own courage when they embrace innovative ideas that influence on outcomes that require full bearing responsibility in front of the Central Agency for information technology management in Kuwait.
- With regard to Problems sensitivity, the workers in information technology have an intermediate level of ability to problems sensitivity, This result is due to workers ability in information technology in Kuwait to deal with problems of work with greater sensitivity and as a result they have valid and effective vision of the generated problems in the work environment and its early expectation before they happened which pushes them with strength and ability to address these problems and solve them.
- The study results Indicated by the value of (Adjusted R2), 15.7% of information technology variables explain the interpreted in innovation by 15.7%, which means that the work in information technology central agency in Kuwait caused by sufficient incentives and diversity training programs that workers received, especially in information technology and many other factors.
- The results indicated an impact of using information technology in managerial innovation this result agrees with the findings of (Al Dahhan & Walmkhamrh, 1990; Al Dmoor, 2003; Tarawneh, 2003), and This result confirms that the use of information technology contribute to the innovation possibilities of management staff in information technology in Kuwait, and that what this technology provides to working individuals with the hardware, software, databases and networks necessary to transfer and implement ideas to make them a reality, Because of programs nature, modern devices, the possibility of transmission of knowledge and appropriate technology with nature and the Central Agency for information technology name which is reflected in the increased rates of managerial innovation.
- There is an impact of devices and hardware in managerial innovation, researchers justify this result as managerial innovation requires enormous capacity devices in terms of speed and storage this was available by the Central Agency for information technology in Kuwait. And also there is an impact of software on managerial innovation, but this impact is not statistically significant which shows that from a statistical point that managerial innovation is influenced by other factors than software.
- There is a an impact of databases on managerial innovation, researchers justify this result, that

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managerial innovation requires an investment in databases and that offers by information technology Central Agency in Kuwait. And there is an impact of networks on managerial innovation, managerial innovation occur through diverse and complex networks enable employees communicate when needed without any interruption which enables workers to develop their creative abilities in various fields.

VIII. Recommendations

Based on the results of the study, researchers recommend to:

1. Encourage teams to share ideas and come up with creative ideas and viable benefit that reflected on community service.
2. Invest in emerging technologies in the interest of the central agency and give it the opportunity to provide better service to the ministries on citizen service and through the purchase of suited software to evolve with the citizen needs.
3. Invest through what is called cloud storage technology that provides easy access to information about the organization or individual.
4. Control human element use of networks to control effective use of the organization interest.
5. Adopt of policies and training programs for innovation and through the presence of a specialized chamber encourage innovation and allow workers to conduct experiments for the purpose of evacuation of responsibility for workers in the event of failure when turn their ideas into reality.
6. Strengthen incentives and rewards to encourage creators by giving them bonuses, and promotions.
7. Provide Training programs for workers in various parts of the agency and the various managerial levels preparation in order to develop their abilities and increase their effectiveness in dealing with information technology and developments.
8. Prepare workshops and seminars from time to time in to educate managers and staff privileges and benefits achieved through investment in information technology and keep abreast of developments and results of the organizational and community-level innovation.
9. Pay Greater attention in human resource, especially in the stages of selection and appointment.

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