Impact of Information Technology in Facilitating Communication and Collaboration in Libyan Public Sector Organisations

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Abstract

There is evidence that information technology already has significant impact on communication, organisational structures, management and functioning of most organisations. Information Communication Technology (ICT) results in changes to lines of command and authority, and may influence the centralisation or decentralisation of decision making and control systems. New technology, it is argued, typically results in a flatter organisational pyramid and with fewer levels of management required. In the case of new office technology it allows the potential for staff at clerical/operator level to carry out a wider range of functions and to check their own work. The result is a change in the traditional supervisory function and a demand for fewer supervisors. In this paper, a critical review of available literature is presented, which relates to the impact of information technology in facilitating communication and collaboration on communication behaviour in public sector organisations. This is in order to identify deficiencies in the area of study as well as to draw some lessons for future research. The focus is primarily on the effect of information technology in facilitating communication and collaboration in Libyan public sector organisations. Key issues associated with definitions of culture, organisational culture, communication behaviours, information technology, collaboration are presented and discussed. In addition, a critical review and synthesis of related studies on the effect of information technology on communication behaviour of individuals in organisations are addressed. In conclusion, the paper argues that the impact of information technology to facilitate communication and collaboration in communication behaviour in organisational settings is complex. The implications of these complex issues to research strategy and design are also documented together with recommendations for researchers.

Key word: communication behaviour, information technology, Libyan local culture, organisational culture, organisational structures, public organisations

1.   Introduction

The theoretical and intuitional field of structural studies has developed over the past three decades, during which time various problems, issues and debates have emerged from within the literature. Thus, this review considers the impact of information communication technology on the communication behaviour of individuals in Libyan organisations. In this paper recent information communication technology studies are examined in order to investigate its impact on the organisational structure and communication among staff in Libyan public and private organisations and to provide suggestions for future research on this issue. It also analyses the impact of culture issues on adoption ICT and the extent to which information communication technology affect the communication behaviour of individuals in terms of harmony and organisational hierarchy structure in Libyan organisations.

2.   Methodology

This paper draws on an ongoing doctoral study in the area of communication in Libyan planning organisations. This paper, however, is primarily based on a thorough and critical review of literature. It documents and discusses key issues drawn from related literature and areas of communication behaviour, organisational dynamics and power influences in public and private organisations in Libya. Academic journals, conference proceedings, text books and websites are the main sources of information.

3.   Culture

Culture is strongly connected with communication and is defined in many ways. Martin et al, (2004, p. 337) have defined culture as "learned patterns of behaviour and attitudes shared by groups of people". Moreover, the American Psychological Association (2002) defined culture as "The belief system and value orientations that influence customs, norms, practices and social institutions including psychological processes (language, care taking practice, media and educational systems) and organisations (media educational system)". Thus, culture at the societal level is manifested in values and less in practice. However, culture at the organisation level is more likely to be manifested in practice and less in values (Hofstede, 1997). Therefore, culture can be defined as the shared patterns of behaviours and interactions, cognitive constructs, and effective understanding that are learned through a process of socialization. These shared patterns identify the members of a culture group while also distinguishing those of another group. Due to national cultural influences, Twati and Gammack, 2004 consider organisational culture in Libya as a strong culture, which resists organisational change in many ways, including the adoption of information communication technology, decision making process, communication, employment, professionalism and other aspects.

4.   Information-communication technology

Information Communication Technology (ICT) was conceptualized by a number of researchers as electronic machines, devices, and their applications that have both computing and communication capabilities.

For example, Child and John (1987) defined ICT as technologies and applications which combine the data-processing and storage powers of computers with the distance-transmission capabilities of telecommunications.

Similarly, Huber and George (1990) defined 'advanced IT' as devices (a) that transmit, manipulate, analyze, or exploit information, and (b) in which a digital computer processes information integral to the user's communication or decision task. Exemplars of ICT are electronic mail (e-mail), conferencing technologies, electronic bulletin boards, file transfer, collaboration technology (e.g., group support systems), shared electronic databases, electronic data interchange, the fax, voice mail and the telephone. The last three, although often being classified exclusively as communication technologies, are enlisted here because they (1) are pervasive, and (2) are increasingly acquiring computing capabilities (e.g., v-mail systems rest on the computer, the fax can be computer-mounted, while the telephone is becoming part of integrated computer-telephone systems).

5.   Organisation culture

Organizational culture refers to patterns of shared values and behaviours of organization members. Of interest for this review are those values and behaviours that have been researched in relation to ICT. Several studies in laboratory and organizational contexts found that e-mail and other ICT, due to the lack of social cues they imposed, could lead to relatively uninhibited behaviour, social equalization, decision, shifts and creation of new ideas (Travia, 1998).

The relatively uninhibited behaviour was sometimes interpreted as an undesirable aberration from social norms (Kerr and Hiltz, 1982), while at other times it was deemed stimulating to organizational innovation (Brennan and Dooley, 2005). The occurrence of uninhibited behaviour was attributed to personal and group characteristics rather than to ICT itself (Smolensky et al, 1990). Other findings were that ICT could help people to avoid conformism (Smilowitz, et al 1988), express feelings more honestly and create a community of spatially dispersed organization members when social communication bursts out in a bureaucratic organization (Foulger and Davis, 1990), or when scientists utilize ICT on a regular basis (Kerr and Hiltz, 1982). In addition, significant cooperation in knowledge sharing was discovered in ICT-rich organizations (Dhar et al 1989). Moreover, changes in accountability patterns were found among ICT users (Guttiker et al, 1988). Finally, many studies found that communication via ICT is likely to cross spatial and department boundaries (Hiltz and Starr Roxanne, 1984; Kerr and Hiltz, 1982).

6.   Organisation structure

A number of writers have pointed out the importance of an organisation's structure and the relationship between it and organisation's size, strategy, technology, environment, communication and culture (Mintzberg, 1989), (Miller, 1989), (Burns & Stalker, 1961) and (Handy, 1990, 1993). Organisation structure is defined as "the arrangement of workflow, communication and authority relationships within an organisation" (Niewenhuzen and Rossouw, 2008). Analyses, such as those undertaken by Van den Van (1976), Jackson and Morgan (1982) and Fredrickson (1984) put forward a model of three dimensions: Complexity, formalisation, and centralisation. The relationship between ICT and organization structure dimensions was investigated by Thomas 1970, who found that a reduction of hierarchy layers was associated with the use of computers in the insurance industry. Similarly, Pool, 1983). argued that the telephone led to aberrations from hierarchical patterns in the old steel industry because it made possible for workmen to access executives. Next, smaller formalization was found to be related to the use of computer systems in manufacturing firms (Pfeffer et al, 1977) and in various industries (Wijnhoven and Wassenaar, 1990).

Centralization was also found to relate to ICT, although in a diversified fashion. The link between ICT and decentralization at the operational level was discovered in railroad management (Dawson and McLaughlin, 1986), and in city departments of human resources (Keon et al 1992). Overall, decentralization was related to ICT in manufacturing (Pfeffer et al, 1977), small newspaper organizations (Carter and Nancy, 1984), and in a hospital (Barley and Stephen, 1990).

However, it was also discovered that ICT related to increased centralization at the executive level in the insurance industry (Baker, 1992), large newspaper organizations (Carter and Nancy, 1984), and railroad management (Dawson and McLaughlin, 1986). Finally, ICT-related spatial dispersion was discovered in organizations of scientist (Hiltz, 1984; Kerr and Hiltz (1982) and a software vendor (ECSS, 2008). Thus, a key advantage of information systems is to be able to simplify organizational structures.

Therefore, there is a strong relation between organisation structure dimension and ICT, which would results in reduction hieratical levels, widening span of control, decentralisation at operation level and centralisation at executive level.

7.   Communication behaviour

In the literature there are many definitions for organisational behaviour. Gibson, et al (2000, P.5) described organisational behaviour as follows: "The field of study that draws on theory, methods and principles from various disciplines to learn about individual perspectives, values, learning capacities and actions while working in groups and within the total organisation; analysing the external environments effect on the organisation and its human resources, mission, objectives and strategies". Also, Daft and Noe (2001, P.4) defined organisational behaviour as: "The actions and interactions of individuals and groups in organisations". Communication is widely studied as a means of transmitting ideas as part of culture (jandt, 2004). Communication can be divided into three types: verbal (use of

words with specific meaning), paraverbal (tone of the voice), and non-verbal communication. Nonverbal communication can be defined as communication without words while verbal communication is defined as communication with words (Remland, 2004). It has also various components, such as encoding, message, channel, receiver, decoding and receiver response in achieving success in communication. Therefore, communication behaviour is divided into verbal and non-verbal. In verbal communication in high context culture, as in the Libyan culture, people usually use fewer words in delivering messages, which is opposite in low context culture such as in America (Hofstede, 1997). Moreover, in Libyan society, large power distance cultures, formal and respectful behaviours are important in the organisational hierarchy to show differences between the leaders and other members. For instance, members of staff usually use formal title when they communicate with their leaders, such as Mr, Dr, and Madam (Hofstede, 2001). This may be due to social tradition which encourages respect and obedience to parents and elderly people (Abouhidba, 2005). Therefore, an understanding of the national culture has a serious influence on how managers and employees communicate to make decisions and interpret their roles (Hanky, 2004).

8. Public and private organisations

According to (McNamara, 2001), an organisation is a group of people working together to achieve the same goal. In the beginning, organisational studies concentrated on moral bases of management, leadership and dynamism of bureaucracy. In the second half of the last century there were different studies about organisational structures, activities and relationships between organisation and their communities (Boden, 1994). In traditional political science literature it is emphasised that there are distinct differences between private and public organisations (Lane, 1993). Most public organisations do not have the same strategic freedom that private organisations have since some of their strategic goals are decided by politicians. This puts constraints on public organisations' ability to operate and may in some instances force public organisations to make decisions that are not sound for society at large (Lane, 1993). This also affects the resources available to public organisations. They do not always have the resources needed in order to meet demands, making it necessary for public organisations to prioritise which customer/user to serve. This is a situation unfamiliar to private organisations (Eskildsen et al., 2004).

A further feature of traditional public organisations is that they are subject to political rather than market controls. External controls on private organisations are market controls such as competition, consumer constraints and shareholders interests. Instead, public organisations have traditionally been constrained by political authority and political activities. Their objectives, structures, and processes have often been defined by central bureaucracy agencies or constrained by legislation (Cole, 1988).

In Libya, communist public organisational systems are adopted in many sectors, such as business, education, health, and media in addition to other social and political organisations. The Libyan national culture is characterised by high power distance, low individualism, medium masculinity, High uncertainty avoidance (Hofstede, 1983). The most common form of organisations in Libya is the classical bureaucratic structure. This structure is inflexible, impersonal and high standardised. Furthermore, it is characterised by a tall structure, which have many hierarchical levels, there is a long distance between the top manager and the bottom manager, the more hierarchal the structure, the more

inflexible is like to be, the more difficult communication becomes. There are large number of job titles and a career path to employee. Fewer numbers of subordinates a particular manager is required to guide, the organizational structure would be taller. Libyan public organizations are owned by government, and are runned by general managers. They promote values of high power distance and collectivism (Twati, 2004).   Therefore, the organisational culture in Libya as a strong culture resists change in many ways, including adoption of ICT, decision making process, communication and other aspects.

9.   Technology's impact on organisation

The impact of information technology will have significant effects on the structure, communication, management and functioning of most organisations. It demands new patterns of work organisation and effect individual jobs, the formation and structure of groups, the nature of supervision and managerial roles. Information technology results in changes to lines of communication, command and authority, and influences the need for reconstructing the organisation and attention to job design. Computer based information and decision support systems influence choices in design of production or service activities, hierarchal structures and organisations of support staffs. Information Communication Technology may influence the centralisation/ decentralisation of decision making and control systems. New technology has typically resulted in a flatter organisational pyramid with fewer levels of management required (Edward et al, 1991).

In recent times, technology has become an ever increasing presence in organisations and it is one of the hot topics. More and more businesses, large and small, are trying to incorporate the latest technology into their operations. This notion is evidenced by the fact that the popular publications now have technology sections, and information systems departments are becoming critical components of most organizations. The appeal of the whole information technology arena is that arguably it is designed to make people and organizations more knowledgeable, efficient, and profitable.

The scope of technology that an organization can espouse or employ is huge. Regardless of the complexity of the system or the size of the organization, one thing is certain - the incorporation of such technology or information systems will accompany change. Implementation of technological systems can either act as a catalyst for change or be the means of achieving a desired change. Regardless of the motivation, a properly integrated system ideally will take into account the impact on the organization before it is put into place. The contribution of information technology and its impact on the organization is emphasized by Nadler in (Gerstein, 1992 p.5), who states "perhaps the largest single influence on organizational architecture and design has been the evolution of information technology, certainly has its place among the key elements which shape an organization. The model used by Andersen consultants is typical when it lists technology as an equal attribute, along with strategy, people, and business processes. The interconnectivity of these elements should be obvious, for one cannot be changed in a transformational sense without at least consideration of the others. While the formal structure or arrangements within an organization will likely be affected by the arrival of new technology, this does not have to be the case in all situations. More specifically, information technology can be linked to changes in factors such as job design, physical layout or

location, supervisory relationships and autonomy, cooperation inside and outside the organization, and formation of work teams.

One advanced idea whose time has come is the notion of the virtual workplace. This concept is based on the idea of employees being able to work independently as a result of having access to information. One article proposes "the virtual workplace provides access to information you need to do your job anytime, anyplace, anywhere. Employees do not have to be tied to their offices to do their jobs."(Jenner, 1994 P.16). The idea of not even having a set office space certainly would be a change from the typical routine of showing up at the office from 9 to 5 (ideally) and performing your work at your desk. Such a plan would obviously be dependent on the job to be accomplished, but it is interesting to think of the supervisory implications. Such employees would have the ultimate amount of autonomy and would have to be managed accordingly. Tasks would have to be more objective or goal oriented and measures of job performance could no longer depend on face to face interaction, but rather would have to be tied strictly on the ability to complete assigned tasks.

It seems to be a common theme that information systems will change even more traditional supervisory relationships. Computer networks allow people to communicate quickly, share ideas, and transfer information without regard to physical locations, or to a reasonable extent, even without regard to the temporal dimension. Therefore, a supervisor will be able to monitor the activities of a larger number of subordinates without requiring them to report directly to him/her. Both David Nadler and Jeremy Main refer to this "span of control" as a measure of how many individuals or teams that a supervisor can effectively manage. Main makes the point that such spans will give way to "spans of communication" which he defines as the number of people that an executive can reach through a good information system (Main, p.52). Nadler makes the prediction that such an executive could supervise hundreds of empowered individuals and groups (Gerstein, 1992 P.173). It is important to note that again interdependency of people and technology comes up in the form of empowerment. Obviously, such relationships would not be possible under traditional job limitations, but through empowerment of employees; such a stage can be appropriately set. This implies that the employees are properly trained on the technology and that they understand the direction taken by the organization and their role in it. Thus the informal organization is also affected because now the culture is changing by giving employees more authority and self-direction. The theorist Peter Drucker sums up the autonomy of this new empowered employee by saying " employees in the new information-based company will know what they have to do without a flock of vice-presidents feeding them information and orders."(Main, 1988 P.50).

The use of information systems can also impact the organisation's relationship with other organisations. The ability to gain information from others up or down a process or distribution channel makes having control over that process or entity less of an issue. This is especially true of organisations that may have considered a vertical integration strategy, but now realize that "vertical integration becomes less necessary when organisations use information systems imaginatively."(Main, 1988 P.51). The ability to share information and the ease of transferring designs can also lead to an increase in outsourcing, which is a growing trend as organisations try to reduce their own workforces and may find themselves shorthanded. The tasks that employees perform within an organization are being drastically affected by the increased mechanization and application

of technology as a part of the production process. In many settings, tasks previously performed directly by human operators are being automated, changing the human's task to one of supervisory control. "Now the expectations of an average employee in such an environment has to change, because they are no longer performing repetitive tasks, but rather must be able to recognize and react to problem situations" (Fleck, 1999 P.625). The fact that today such work has been automated to a great extent leads to the issue of restructuring the work. A pattern which seems to be catching on is illustrated by Rosenbrock 1993 in his description of a workforce which shares in the purpose of production through the organization of production 'islands' or 'cells'. These cells would be self-managing and responsible for scheduling, quality, supplies for their area, and the maintenance of their machinery.(Rosenbrock, 1993 P.169). He basically sees the automated facility as an opportunity to shift the emphasis towards work teams with a great deal of autonomy. Although the formal structure does not have to change to qualify as a transformation, the above discussions point to the fact that the structure will nearly always be affected by the implementation of technological systems. In his Fortune article, Main 1988 speaks about winning companies, saying "they will adopt fluid structures that can be altered as business conditions change. More than being helped by computers, companies will live by them, shaping strategy and structure to fit new information technology."(Main, 1988 P.50). This emphasis on flexibility points out the fact that there is no one formula for determining how the formal organization will look after such a change. In his simile between organizations and architecture, Nadler points out that "in organizational terms, the role of the hierarchy as the principle means to coordinate, control, and facilitate communication is dramatically impacted by the capabilities of information technology. The existence of these capabilities, however, does not determine the organizational architecture of the future; it simply makes a new architecture possible."(Gerstein, 1992 P.25). Nonetheless, the efficiency gained from technology and associated information systems will generally serve to reduce the number of people in an organization; except perhaps in the information systems department/area. But with tightening budgets, even these departments are feeling the need to downsize. Main 1988 also makes the prediction that corporate staff could disappear, and that after implementing IT programs, it is common for an organization to move from a dozen layers of middle management between the front-line supervisor and the Chief Executive to about six (Main, 1988 P.52). IT affects the nature of individual jobs and the formation and structure of work groups. There is a movement away from large scale, centralised organisation to smaller working units. Processes of communication are increasingly limited to computer systems with the rapid transmission of information and immediate access to their national or international offices

  Thus, a key advantage of information systems is to be able to simplify organizational structures. Although they served a purpose at one time, the benefits of improved coordination and increased supervision discussed earlier arguably replace the need for tall, hierarchical organizations. In fact firms with well-developed management information systems lend themselves to a move towards flat structures. However, caution needs to be exercised. One author warns that delayering is not right for every organization and should not be done unsystematically (Nelson, 1988 P.56).

10.   Widening the span of control with information technology

As has been mentioned Information technology can be utilized to widen a manager's span of control. According to (Monge and Fulk, 1999), "Hierarchical organization forms are social structures based on

domination and control through rules, programs, procedures, and goals. Communication and information technology can now assume these functions by programmed routines that are built into the technology..." Organisations that use computer-based technology, then, can eliminate middle management, allowing them to widen the span of control of managers and thereby flatten the organizational structure. Decreasing the layers of control increases communication and the flow of information across departments and groups. On the other hand it makes organizations more complex, differentiated, and decentralized.

Employees required to make decisions that in the past might have required managerial input can use decision support systems (DSS) and expert systems. Even unusual or unique problems, which have not yet been incorporated into a DSS or a searchable database, still can be solved more easily with IT. While in the past, managers had to solve such problems by communicating directly with employees, today, IT allows for communication that is asynchronous (at different times and places). Thus, computer-based technology removes temporal and spatial barriers to communication and collaboration. Moreover, a manager can receive E-mail from numerous employees and solve dozens of problems when he or she has the time and from various locations.

The geographic proximity of the employees being supervised is irrelevant to organizations that utilize the latest IT, which makes it possible for these organizations to coordinate necessary tasks. Managers who take advantage of the latest group support systems (GSS) software, which aids group decision-making, and who make use of E-mail and videoconferencing can widen their span of control, even if employees are spread all over the world. Geographic proximity between managers and employees is no longer necessary. Today, employees at many companies telecommute. One company can utilize computer programmers working in India, manufacturing facilities in Singapore, and information officers in California. GSS software, such as Lotus Notes, allows for asynchronous interaction by, as well as between, employees and managers. Moreover, by having computer-based technology, it makes it possible to reduce layers of management and flatten the organizational structure.

Emerging computer-based technologies offer an ideal teaching and learning environment. As such, they can be harnessed to train and to improve the abilities of employees. For example, continuing skills-based education can be accomplished through the use of IT (e.g., educational software utilizing multimedia, simulation, teleconferencing, web sites). Training materials can be placed online, enabling employees to learn at their own pace. Furthermore, employees who have questions can go to the Internet and/or Intranet (an individual firm's private network using Internet technology) and find solutions, thereby freeing management from having to answer every question.

In giving employees direct and immediate access to knowledge and information previously possessed solely or primarily by middle management, IT makes possible the empowerment of employees. Under empowerment models of management, a participative workplace climate is created with decentralized decision-making, employees are given decision-making authority and are held accountable for results (Rominger, 1996; Sheridon, 1998). Empowerment allows well-trained and experienced employees to swiftly make decisions in a changing global marketplace. By dispersing information throughout the organization, then, IT enables employees to improve their abilities and to be entrusted with decision-

making, thereby eliminating middle management, widening the span of control and flattening the hierarchy.

Today, face-to-face communications have been replaced, to a large extent, by E-mail; thus increasing the speed of decision-making. Companies need managers who understand technology and know how it can be used to make companies more efficient. It is necessary for today's managers to have the ability to envision solutions through the use of technology, for example, the various types of computer support that enhance decision-making and creativity (Klein, and Dologite, 2000). Moreover, even an "ordinary" manager with the ability to harness the knowledge available over the Internet and Intranet can become extremely effective. A good manager, today, is not one who relies solely on the knowledge learned in the past, but rather one who is willing to find the latest information using the most recent technology. By improving and supplementing the communication and decision-making abilities of managers, IT allows managers to widen their span of control, resulting in the thinning of the ranks of middle management.

While implementation of information systems and technology in general can be a gain to an organization and be part of a transformation that results in vital improvement, it is also essential to at least consider the drawbacks associated with this progress. By doing so, the organization can avoid some of the associated pitfalls. These disadvantages can be categorized as behavioural and non-behavioural. To begin with the second of these groups, there are potential problems with the networks that would be established to allow information to flow. First of all is that as the number of users increases, strains on the system and on the ability to monitor users' activities will begin to emerge. Furthermore, organisations want systems that can cross organizational boundaries, which would be needed for the utmost level of outsourcing or collaborating design efforts. As many frustrated computer users would understand, there are potential constraints due to compatibility between systems. In addition, such a system would make it easier for a potentially hostile company to gain sensitive information that it could use to its advantage (Friedmann, 1994).

The behavioural issues revolve around two major themes. One is that people and organizations tend to reject new technology because they are reluctant to change. For this reason it is important that the change come about as part of accompanying change in the organizational practices and culture. It is also essential to incorporate organizational learning in to the acceptance of information technology. It is through learning (with coaching from those familiar with the technology) that the organization's members will allow the change to take hold and reach new heights of productiveness (Seybold, p.264). The second theme concerns employee involvement in the change and the resulting job satisfaction. This aspect relates back to the discussion of empowerment needed to effectively implement automated processes. If it is not viewed as part of an overall transformation, the addition of technological process improvements or information systems which on the surface take away human responsibility is likely to lead to job dissatisfaction. In one sense such advancements remove the last bit of skill that employees put into their job. Evidence of such discontent is given by absenteeism within the auto industry and by acts such as sabotage at a state-of-the-art General Motors facility at Lordstown, Ohio.(Alexander, 1977, P.401). The bottom line is that as good as technology may be, it cannot act alone as a cure-all to improve organizational effectiveness.

Many information systems departments themselves are also discovering that they can stimulate improvement in overall company performance by integrating information systems to internal structural change. To do so involves establishing self-directed work teams with more responsibility and freedom. For example, West Coast Energy, Inc. is a natural gas transportation company in Vancouver, British Colombia. They found that the original support provided by their systems and information systems staff did was not align with the way that the company did business. After failing at one attempt to fix the problem, they realized that the key was in the linkage between the processes and the information technology. The division manager of information systems and technology summed it up as "originally, we tried to disperse the staff out to the business units, but we were getting little receptiveness. Later, we implemented a reorganization to align IS with business processes. We used to be functionally aligned. Now we are business process aligned "(Goff, 1994, P.100). Another example of this same issue in a different industry is Metronic Corp in Minneapolis, which makes medical implant devices. Their 90 member information systems department is organized into sixteen functional teams that are aligned with the corporation's six lines of business. But there still is flexibility. As the project load changes, team members may cross over to other teams to provide assistance (Panepinto, 1993 P.84).

11. Knowledge workers in organisation

The above study has highlighted a number of characteristics that are relevant to effective functioning of knowledge workers in the learning organization. A knowledge worker is anyone who works for a living at the tasks of developing or using knowledge (SearchCRM.com, 2003). For example, a knowledge worker might be someone who works at any of the tasks of planning, acquiring, searching, analyzing, organizing, storing, programming, distributing, marketing, or otherwise contributing to the transformation and commerce of information and those (often the same people) who work at using the knowledge so produced. At a fundamental level, the objective is to achieve the synergy of data and information processing capacity of information technologies, and the creative and innovative capacity of their employees. Hence, the knowledge workers need to be facile in the applications of new technologies to their business contexts. Such understanding is necessary so that they can delegate "programmable" tasks to technologies to concentrate their time and efforts on value-adding activities that demand creativity and innovation. More importantly, they should have the capability of judging if the organization's practices are aligned with the dynamics of the business environment.

12. How an organisation nurture their knowledge workers

Technology enables the knowledge worker. It provides the foundation for making full use of data coupled with employees' skills and ideas. There is a need to automate and centralize the sharing of knowledge to deliver only the relevant information to employees from every possible source. They ensure the right information goes to the right person at the right place and at the right time. The challenge for many organizations is to capture an employee's knowledge and share it with others, thereby empowering the entire organization to make best use of its information. Furthermore, single organization employee rarely performs an entire work process, therefore staff must be able to

collaborate and work as team on different project documents and databases which usually reside in disparate back-end systems.

Organization can empower their employees by developing new service processes and exploiting open Web-based technologies that enable easy integration among applications, devices and data storage. Automated workflow, document management, data warehouses, intranets and extranets can all work together to ease the flow of communication. They allow organizations to optimize processes on a team-oriented basis. They also enable employees to move naturally back and forth from working within a document to working within a group of people. No matter what they are doing, common applications are always at hand. Colleagues can respond easily to day-to-day questions and unplanned events in real-time. Employees throughout a department can contribute to a goal without major interruptions in the flow of their work.

From this discussion, it is apparent that technology is a critical element of organisational transformations. While it is generally viewed as progressive and a means to increase the efficiency and overall performance of the organisation, this can only happen if it is done as part of a larger change effort, regardless of whether the change is driving the technology, or technology is driving the change. Organisations that are able to successfully undergo such changes will be better prepared for the future, since there is no doubt that the emphasis on increased use of information technology and advanced automated systems will continue. As one source put it, "the trend toward a highly mobile, flexible, dynamic, informed and networked workforce is growing exponentially."(Jenner, 1994 P.15).

13. Conclusions

From the literature review of information communication technology studies, it can be concluded that the impact of information technology have significant effects on organisational structure, communication processes, management and functioning of most organisations. Decreasing the layers of control increases communication and the flow of information across departments and groups, while also making the organizations more complex, differentiated, and decentralized (Edward, et al 1991).

Libyan organisations are characterised by a bureaucracy and tall hierarchal structure. The more complex organisations, made up of many horizontal and vertical divisions , have a more important need for efficient communication (Hatch 1977) . In conclusion, Libya as a case has not been sufficiently researched. Therefore, there is a necessity for more empirical studies to investigate the cultural and structural issues that inhibit the adoption of information communication technology within the Libyan context. Research in the future should investigate the role of information communication technology on eliminating layers of bureaucracy in Libyan organisation's structure.

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