

# Administration of Faculties by Information and Communication Technology and Its Obstacles

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**Abstract---**Information and communication technology (ICT) provides several facilities and possibilities for educational administrators to do their tasks. Using ICT by dean of faculties lead to effectiveness and productivity of higher education in competitive world. How much deans of faculties in Iranian governmental Universities use this technology to perform their managerial duties and tasks? And which obstacles do they encounter to use ICT in their faculties? This research evaluated the extent use of ICT by dean of faculties in governmental Universities and studied the obstacles that they encounter in using ICT. Research method is descriptive and a questionnaire has been used for collecting data. Participants include 20 deans of faculties of selected governmental Universities during second semester in 2003-2004.

Research findings show that head of faculties use this technology in planning function. It was used by them in Data collecting, decision making, operational planning, budget planning and classroom programming. It was used high extent by dean of faculties in executive affairs such as: academic affairs, student affairs, research affairs administrative and financial affairs. Also they have used it at high level in supervision and evaluation of student affairs, research affairs and academic affairs, financial affairs and administrative affairs. Moreover it is applied in developing human recourse knowledge and ability as much to increase scientific level of faculty members, students and staffs, and it was used too in communication function in favourable level. They have used ICT in low extent in staff and academic member performances evaluation and supply department affairs.

The important obstacles to using this technology to do managerial duties are low level of staff Specialized knowledge, lack of professional human resources and lack of financial resource and budget.

**Keywords---** Information and communication technology, Planning, Executive affairs, Evaluation, communication, Obstacles.

## I. INTRODUCTION

Information and communication technology (ICT) is a common term that has been used in scientific society, computer industry and is modern technology to gathering, storing, exchange, managing and processing information in a given situation. Computer and communication technology are basic supporting factors of this technology and the role of these factors to storing and distributing data is critical. On the other hand, a communication and information system is a set of related parts that function together within an environment to transfer, store and retrieve, and/or process information. (Maughan, 2001)

This technology has impact on education, agriculture, culture and technical and scientific courses. Due to the emerging technological innovation, information technology is growing rapidly (Mahagan, 2002). As a result it may change every thing in our world. ICT have the potential to create Jobs, improve access to basic services, and increase the sharing of information between people living in different parts of developing countries (NORD, 2002). By using this technology, homes are work environment and departments. This technology has provided extensive advantages and many services to universities. Some of them includes: internet, web, E mail, virtual classes, E- conferences, decision making supporting system, and artificial intelligence system and so forth. Universities can use them to response effectively to expectancies and wishes of their internal and external environment.

Burgeoning communication and information systems have changed the very nature of higher education, allowing information to be transferred, stored, retrieved, and processed by almost all who work, study, or interact with a given institution. Questions associated with who requires what sorts of information, what format of signal is required, and what value should be added are addressed in multiple ways as decisions are made across the institution. If information is the currency of the modern institution, the key to the account is access, which is gained through a communication and information systems infrastructure that is responsive, flexible and user friendly (Maghan, 2001).

Employing this technology in Iranian governmental universities is common and its advantages would be used in academic, student, staff, financial, administrative and research sectors. The Iranian governmental universities use this technology and its possibilities and potential in various areas. This research evaluates that how much head of faculties in Iranian governmental Universities use it to do their managerial duties and to find the reason that they can not use technology potential and capacities to do theirs duties accurately. Then the main questions of research are how much deans of faculties in Iranian governmental Universities use this technology to perform their managerial duties and tasks? And what obstacles do they encounter in using of ICT in their faculties?

This research is designed to finds answer to these main questions, evaluates the extent use of ICT by head of faculties in governmental Universities and studies the obstacles that dean of faculties encounter in using ICT.

## II. REVIEW OF LITERATURE AND PROBLEM FORMULATION

Universities are changing and their budgets aren't stable. As a result they review their priorities again and reorganize them. Students, staffs and scientific members have more requests from higher education in comparison with the past. Industry requires staffs that have extensive skill, more knowledge and technical skill to work in complex environment. Technological change and information revolution enforced and pressured the universities to invest on equipments and personnel until being able to response internal and external pressures. Therefore most of universities have been reorganized that enable to face new challenges and to use new advantages and new opportunities (Mathieson, 1994). ICT can affect universities in various aspects for example, it can support strategic plan of universities and decrease its cost.

From basic telephone service to high-speed Internet access, from word processing to the administrative systems that underlie institutional business processes, every member of the higher education community relies on a variety of information technologies each day. Unlike most other support areas, information technology (IT) pervades every aspect of the institutional mission: instruction, scholarship, research, service, and economic development. Literally everyone in a college or university—applicant, student, instructor, researcher, staff member, executive, or alumnus—is affected by the quality of institutional IT infrastructure, services, and support (Lassner, 2000). Although The authors focus primarily on the teaching and learning functions of the institution, but they also identify other important campus activities—Philosophy, Mission, Funding, Curricula, features along with others, a more general functional analysis of the entire institution renders four primary functions:

1. Academic/Instruction—all aspects of teaching and learning
2. Service/Support—library, printing, housing
3. Management—employees, resources, projects
4. Fiscal—funding, contracts, payroll, tuition (Maughan, 2001)

Jalili (2001) evaluated effect of ICT on manager and staff effectiveness in Islamic revolutions Janbazan organization. He find out that managers believed using ICT can enable them to do better their duties in planning, organizing, controlling and leading. Also his findings show that staffs and mangers should be trained till being ready to work with information technology, and then effectiveness would be increased (Jalili, 2001). Emerging information age and globalization lead to facing higher education managers with several challenges, according to this, administering the universities would be complex and they need complicated communication skills and techniques to do correctly their organizational duties and responsibilities. Educational organization must be adapted to these technological changes to fulfil its consumers and beneficiaries expectancies.

Also, there are some researches that demonstrate using ICT would lead to increase effectiveness and efficiency of manager in universities. When a manager uses internet to doing his

duties, it help him/her to develop his/her communication duties and can accesses easily to information that needed to do his/her responsibility, and then it can decrease the cost of organization (Brain, 2002). Information and communication technologies (ICT) and management tools within the universities will contribute to a rationalisation of decision processes, better management and therefore strengthen power and authority of the leader within universities (Gueissaz, 2002). Now worldwide, universities are grappling with how to transform themselves to cope with the challenges and opportunities posed by information and communication technologies (ICT) (Breen, at al, 2001). A recent Australian study, 'Academic work in the twenty-first century', observed that 'many universities are looking at ways in which the use of information technology can be 'mainstreamed' across the university. These changes require co-ordination, planning and recursing at an institutional level (Coldrake & Steadman, 1999, p. 7).

ICT have been used in both governmental and private universities in Iran but unfortunately the way of utilizing this technology is not appropriate and they can not apply ICT potential in a correct way. Information technology can not attain to its capacities in universities unless they establish specific management structure.

Researches have demonstrated that one of the reasons that managers unwilling to use ICT are negative experience and shortcoming experience of previous success. Thus using ICT faced to resistance because managers have not reasons to change successful systems (Claire, 2000). University staffs may resist employing ICT in universities because they feel insecure and inexperienced. Therefore manager must inform that ICT produce positive transformation in organization. In case of not inform staff about the important role of technology in organization it may bring about job replacement and desertion.

Managers who utilize ICT in public organization encounter with internal and external problems. Some of the internal organization problems are non accessibility technology, lack of staff expertise and skill and organization unready.

External problems to use ICT in governmental organizations are divided in three groups: economical, technical and legal aspect. Financial support and cost are most problems to use ICT in universities. Researches indicated that cost is the basic problems of usage ICT in any governmental organization because soft wares and hard wares would be expired during short time and governmental organization that depend on governmental budget and grant, can not continuously pay to such expensive products (Claire, 2002). Clark's findings demonstrate that apply ICT in universities requires budget and financial resources and management stability support. If there is no financial support on ICT in organization and changing organizational management occur rapidly, implementation on ICT in organization would be faced to problems (Clark, 2002). Daugherty and Flunke (1998) reported the barriers/challenges confronted by faculty when incorporating web-based instruction are: lack of technical

support; lack of software/adequate equipment; amount of time required; and lack of faculty/administrative support.

Farquhar and Surry (1994) proposed organizational factors with the adopter's individual factors as influential factors which affect the adoption and utilization of the instructional product. Separating organizational factors into two categories, (i.e., physical environment and support environment), they put more emphasis on the importance of the support environment that includes the resources and services needed to install and maintain an instructional innovation. They asserted that inappropriate environmental support can often be an important hindrance factor of successful innovation adoption.

Three factors faced by university faculty members were considered by Passmore (2000) as impediments to web-based course delivery: (a) limited access to and experience with resources for web-based design, development, and delivery, (b) uncertainties about status of intellectual property created for web-based courses, and (c) lack of a reward system tied to innovation in instruction. (Passmore, 2000)

Another problem and obstacle to development and utilize ICT in universities are lack of appropriate legal and rules. Legal problems in ICT development are traditional rule and regulation, not approved intellectual ownership right, unknown legal credibility in electronically transactions (Claire, 2002). On the other hand, in company with growing electrical information, signature of information and approve it are in growing and amount of credibility of this information is in question (Cioci, 2000). Then electrical information and signature must be approved by appropriate laws. Therefore the main problem to develop ICT in universities is legal problems. This obstacle hinders the freedom of managers in organizations.

Now ICT is used in both private and governmental universities of Iran and their faculties. They are allocating financial facilities for developing ICT annually and hope that using this technology helps them to increase their effectiveness. But the evidences show that they are not successful in using all the competencies and potentials of ICT. And head of faculties don't use this technology correctly in doing their tasks. This is due to, traditional methods been used by head of faculties. And they can not use it to do their duties appropriately. This research evaluated the amount use of ICT by head of faculties to do their duties and it is intended to find obstacles in using ICT inappropriately, and also provided appropriate recommendations to use and perform ICT in the faculties of governmental universities.

### III. METHODOLOGY

In this research data have been gathered by descriptive method. The instrument for collecting data is a questionnaire that made in Likert- type scale format. Participants were asked to indicate on a 6-point scale the degree to which each statement describes their usage of ICT and its obstacle in doing their duties. Possible responses ranged from 1 = non use to 6= high use. A score of 1 indicated "nonuse" degree of descriptiveness, while a score of 6 indicated a "high" degree of descriptiveness.

Participants for this study were dean of faculties who were employed during the second semester in 2003-2004 at selected universities.

Random sampling method was used and chosen 20 sample form accessibility of dean faculty of selected Iranian universities.

The data is analysed by descriptive statistics. for data description, the six point scale merged in to three point and attribute 1 to one ,two and three option and 2 to four option and 3 to five and six option. And then the new category value likes so.

The data were analyzed using the scores obtained from the questionnaires and Descriptive statistics, such as frequency distributions, means, standard deviations, and percentages, were used to describe data.

### IV. FINDING AND PROBLEM SOLUTION

The results of this study were analyzed to find the answers of two research questions. The two research questions are:

1-how much deans of faculties in selected Universities use this technology to perform their managerial duties and tasks?

2- What obstacles do they encounter in using ICT in their faculties?

After data collecting, they were analysed by descriptive statistic and calculated frequency, percentage, mean and standard deviation. The findings come in five tables as following.

Table 1: the level use of ICT in executive affaires

Managerial function	Percentage*				
	1	2	3	M	SD
Executive affaires:	20	21.6	58.3	4.3	0.95
Academic	0	10	90	5.2	0.59
Student	0	20	80	5	0.64
Financial	0	10	90	5.1	0.51
Administrative	20	40	40	4	1.33
Research	20	40	40	4.1	1.04
supplying	80	10	10	2.4	1.6

\*1= unfavourable, 2= intermediate and 3= favourable.

Table one reveal the level use of information, communication and technology in the executive affair, such as: academic affaire, student affaire, financial affaire, administrative affaire, research affair and supplying affair in faculty of selected universities.

The findings in table 1 demonstrate that %58 of dean of faculties use ICT strongly and very strongly in the executive affairs, mean score is above midpoint (mean=4.3, SD=.95) its mean that the usage ICT in executive affairs is favourable and very well. Also the findings show that dean of faculties used ICT in operation and management of academic affairs (M=

5.2, SD= .59), student affaires (M= 5, SD= .64), Financial affairs (M= 5.1, SD=.51), Administrative affaire (M= 4, SD=1.33) and research affairs (M= 4.1, SD= 1.04) in the favourable extent. Among the six executive affairs, the mean score for the academic affaire (mean = 5.2) was the largest than other items and the mean score of supply affaire is lower than all items. It means that they use ICT in high level in academic affaire and they did not use ICT in favourable level in supplying goods, things and services. Its calculated mean is low of midpoint (M=2.4). Because the e- commerce and e-business in Iran still is not in current use among consumers and sellers.

Table 2: level use of ICT by dean of faculty in planning

Managerial function	percentage *				
	1	2	3	M	SD
Planning:	27.5	22.5	50	3.82	1.52
Operation planning	30	20	50	3.9	1.4
Budget planning	30	20	50	3.7	1.6
Classroom program	30	20	50	3.8	1.6
Data collecting	20	30	50	3.9	1.5

\*:1= unfavourable, 2= intermediate and 3= favourable.

Table two show the extent use of ICT by Iranian dean of faculty in planning function. ICT can help dean of faculties in planning function and embedded data in table two demonstrate that dean of faculty use this technology in planning tasks. The calculated mean is above midpoint (M=3.82) and standard deviation is equal SD=1.52 .it means that dean of faculties utilize ICT in planning function at favourable level.

Data in the table two shows that dean of faculties uses it in data collecting for decision making and planning, operational planning process, budget planning process and classroom programming. They use it in preparing operational planning

(M= 3.9, SD= 1.4), budget planning (M= 3.7, SD= 1.6), classroom program (M= 3.8, SD= 1.6) and data collecting (M= 3.9, SD= 1.5) in high level. But they use ICT in decision making at low level because the usage of decision support system (DSS) and Intelligence support system are not common in Iranian faculties now, and they use ICT to collect data for decision making.

Table three includes data about use of ICT in evaluation by dean of faculties. It shows that manager of faculties in selected universities use ICT in evaluation at favourable. The calculated mean is above the midpoint (M= 3.54, SD= 1.34), it means that they operate the capacity of ICT in evaluation function such as: academic affaires, student affaires, research affaires, administrative affaires and financial affairs.

Table 3: level use of ICT by dean of faculty in evaluation

Managerial function	percentage *				
	1	2	3	M	SD
Evaluation:	40	24.3	35.7	3.54	1.34
Education affairs	20	10	70	4.2	1.6
Student affairs	20	30	50	4.1	1.3
Research affairs	40	20	40	3.7	1.2
Faculty member	60	10	30	2.9	1.6
Staff performance	60	40	0	2.4	1.4
Administrative affairs	40	30	30	3.8	1.1
Financial affairs	40	30	30	3.7	1.2

\*:1= unfavourable, 2= intermediate and 3= favourable

They utilize ICT capacity to evaluation educational affairs (M= 4.2, SD= 1.6), student affairs (M= 4.2, SD= 1.3), research affaire (M=3.7, SD= 1.2), administrative affaires (M= 3.8, SD= 1.1) and Financial affairs (M= 3.7, SD= 1.2) in favourable level, but it was not used in faculty member and staff performance evaluation in favourable level, and calculated means of them are low of midpoint.

Table 4: level of use ICT in human resource and communication

Managerial function	Percentage *				
	1	2	3	M	SD
Human resource development:	26.6	23.3	50	4.1	1.3
Faculty member	20	10	70	4.5	1.3
staff	40	20	40	3.5	1.5
student	20	40	40	4.2	1.2
Communication	30	30	40	3.9	1.6

\*:1= unfavourable, 2= intermediate and 3= favourable

Table four implies data about extent use of ICT in human resource development and communication function. The information that imbedded in the table four shows that dean of faculties use ICT capability in student and faculty member development in beset level. The calculated mean is above midpoint (M=4.1) and standard deviation is 1.3, it means that head of faculty use ICT in this function at favourable level.

Therefore they provide scientific material for student and faculty member such as: access to scientific data bases, e-journal and e-booking.

Data about other managerial function is embedded in this table relate to communication task. The information in the table four about communication function shows that dean of

faculties use ICT for communicating to student, staff and faculty member in favourable level. The calculated mean is above midpoint (M=3.9) and standard deviation is 1.6, it mean that head of faculty use ICT for communicating to student, staff and faculty member in favourable level, also they will attempt to install administrative package and intranet system to facility communication in their faculties.

Table five show calculated data about some obstacles in utilizing information, communication and technology in managerial tasks. Data embedded in table five demonstrate that lack of financial and budget resources, professional personal and low level of specialized knowledge are important obstacles to use ICT in faculties of Iranian universities

Table 5: the some obstacles in use ICT in faculty

<i>Obstacles of use ICT</i>	<b>percentage *</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>M</b>	<b>SD</b>
Security	60	25	15	2.8	1.5
rule and regulation	45	40	15	2.8	1.6
technical and equipment	55	30	15	2.9	1.5
cultural	65	25	10	2.5	1.4
financial and budget	30	20	50	4.2	1.4
low level of specialized knowledge of staff	40	15	45	3.9	1.5

\*:1=not important obstacles, 2= intermediate obstacles and 3= important obstacles

Other obstacles such as security, lack of rule and regulation, and cultural issues that underlined in review literature are not barriers to use ICT in managerial task in faculty and their score means is low of midpoint.

In general the important findings of this research are as follows:

- 1) In relation to use ICT by dean of faculties, findings show that head faculties use ICT in planning such as: data collecting, operational planning process, budget planning process and classroom programming. But they use little it to predict future events also they don't use decision support systems and intelligence support system in decision making.
- 2) Dean of faculties uses ICT very much to do administrative, academic, research and student affairs. Also dean of faculties use ICT to do financial and administrative affairs and providing administrative and financial reports as much but they use little ICT to provide necessary possibilities to transportation units and supply departments.
- 3) In relation to use ICT in supervision and evaluation affairs, we can say that they use it as much as to supervise academic, student and research affairs but they use it little to supervise on performance of

academic member, staffs, teaching and learning and possessions properties.

- 4) In relation to use ICT for improving and promoting human resource, it can be said that this technology was impact on increase knowledge of members of scientific board and student and Staff. it provide scientific material for student and faculty member such as: access to scientific data bases, e-journal and e-booking
- 5) In relation to use ICT in communication, can be say that dean of faculties use ICT for communicating to student, staff and faculty member in favourable level, and they try to install administrative package and intranet system to facility communication in their faculties.
- 6) Research data show that security problem, accessibility non –authorized people to information, the manner of protecting confidential document and fearing from the destroy information, has less impact on ICT development in the universities.
- 7) Research data show that technical and equipment problems, rapid change in hard wares and communicational tools, upgrade soft wares rapidly and not accessibility support services are not effective obstacles on use ICT. Because they access many software in Iran cheaper than other countries.
- 8) Researches show that legal obstacles as lack of rule and regulation about intellectual properties and develop ICT are not effective factors on usage ICT and dean of faculties don't know them as obstacles.
- 9) Organizational culture is important as a vehicle for implementing organizational change (Yeung, Brockbank and Ulrich, 1991). Though studies have acknowledged existence of a relationship between organizational culture and organizational innovation (Kotter and Heskett, 1992) we believe organizational culture influences organizational innovation in higher education institutions. Hefferlin (1969) described colleges and universities as devices essentially for the "perpetuation of culture" with a long tradition of custom and precedent. He continues suggesting that innovation is not especially compatible with such an organization. Levine (1980) reported that academic institutions are deliberately structured to resist precipitant change. Research data in Iranian universities show that organizational culture and society culture is not obstacles to use ICT in universities and organizational culture of selected universities is congruent with utilizing ICT in university.
- 10) Research findings show that economical problems such as: lack of resource for preparing equipment and paying cost of start and running system, lack of financial resources for up to date hard wares and soft wares and lack of budget are more important hinders to use ICT.

- 11) Research findings show that low level of specialized knowledge of staff, lack of enough professional human resource, lack of employment authorization to recruitment professional staff are important obstacles to develop and use ICT , but inconstancy management is not effective on developing ICT in universities

## V. DISCUSSION

The research finding illustrated that dean of faculty in selected universities utilize ICT in operating their task. But information, communication technology that used in the faculty did not integrate systems and this system distracted and apart of each other. In other way, the soft wares and hard wares that used in different department in faculty seldom connected to internet and intranet. Then some of obstacles that underline in review literature are not important barriers for faculties of selected universities. At now they try to install integrating information technology system and establish extranet network in their universities

The governmental universities in Iran are allocated budget by government in form of grants and they must expense them according to the budget plan and can not reallocated them in elsewhere. The recruitment in public university is not convenient, and they not enough authority to do that. At beginning stage they must get permission from government and then employ professional staff in according rule and regulation that government impart to them. In this situation lack of financial resource and professional staff are important obstacles.

Research findings show that using ICT to do management duties by dean of faculties is not comprehensive and multilaterals, and ICT have been used to daily executive affair and automations the ordinary task.

## VI. RECOMMENDATIONS

- 1) Appropriate situation should be created to use all capacity of ICT and integrate system of ICT should be run. Integrated system can help faculties to integrate many soft wares and hard wares products are used on university that some of them are integrated and some stand-alone. Then they must pay attention to appoint a capable information technology management.
- 2) The diffusion process outlined by Rogers (1995) has five steps: knowledge, persuasion, decision, implementation, and confirmation. According to this theory, deans of faculties have to learn about ICT and are persuaded to use it. Therefore the most important factor to use ICT is increasing the knowledge of dean of faculties about possibilities and capacities of ICT. According to this, training is needed.
- 3) Faculty staff and experts should obtain necessary training to work computer soft wares, and apply ICT capability to do their task properly.
- 4) Supplying necessary budget, they can prepare equipment and build substructure tools to use this technology. Therefore they must compete for budget and scare resources to get the largest possible

allocation for their faculties. Also they should request more than their need because the request will be cut.

- 5) Human resource and professional staff are critical factor to increase organizational effectiveness and quality. They can diffuse ICT in faculty but vice versa lacks of professional personal and low level of specialized knowledge are important obstacles to use ICT in faculties of selected universities. Therefore dean of faculties must barging get permission from government for employing professional staff in according their needs.
- 6) The usage of decision support system (DSS) and Intelligence support system help dean of faculties to take better decisions in all their functions and tasks. Decision making is a major responsibility of all administrative and ICT can provide the more facility in getting correct decisions
- 7) We should attempt to decrease additional costs by developing use of ICT and utilize it for doing management duties.
- 8) Academic members should obtain necessary training to use this technology in teaching and learning process. Available training on how to use ICT, and administrative support are very important factors influencing use of ICT in teaching and learning.
- 9) Information exchange between internal universities and developed country universities is necessary .Also we suggest that the selected universities should establish seminars and conferences in this topic annually.
- 10) To function efficiently, higher education need an integrated, agile, secure, robust, and mature communication and information systems infrastructure (Maughan, 2001) then selected universities must to install a integrated and secure information and communication technology in their facilities and encourage the dean of facilities to diffuses using it.

## VII. CONCLUSION

Research findings show that using ICT to do management duties by dean of faculties is not comprehensive and multilaterals, and ICT have been used to daily executive affair and automations the ordinary task. Beside to there is not integrate system. On the other hand, faculties use internet services to send and receive electronically letters and get scientific papers from data base and E-journal (internal and external) to do research and provide scientific knowledge and information to members of scientific board and scholars. As confirmed in this research, this technology was impact on increase of scientific level of faculty's members, students and staffs.

In general, selected universities faculties did not use all ICT capacity to administrative education and there are many problems to developing ICT. Lack of financial and professional staffs has two problems in ICT development and, anther factors such as: legal, security, equipment, cultural, and technical obstacles that are important to ICT development in other countries universities are not essential obstacles in Iranian selected universities. I think if they use ICT by its high

capacity, other obstacles would be revealed. When they establish internal integrate system or both intranet and extranet networks, it can be see other obstacles will emerge.

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