

Managers' Attitudes Towards Web and Information Technology: A Study of Public Sector Managers in Jordan



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ABSTRACT: *The ongoing pressure on organizations to utilize the Web and Information and Communication Technology (ICT) tools successfully should be based on a clear understanding of the organizational context including human and technological dimensions. As a part of this understanding, this paper attempts to explore managers' attitudes towards Web and IT. In addition, the relationship between certain demographic characteristics and managers' attitudes is explored. The focus of this paper is Jordanian Governmental Organizations (JGOs) where ICT deployment is seen as a high priority. To achieve this, the Computer Attitudes Scale (CAS), a well developed tool, tested and validated in the educational setting, was used with very minor modifications. A survey approach was utilized which involved the application of a standardized questionnaire. Exploratory factor analysis was used to explore patterns of complex multi-dimensional relationships and bivariate approaches for various attitudinal components towards Web and IT and demographic characteristics were used to further analyze the data. The findings revealed that managers were found to have highly favorable attitudes towards Web and IT, additionally, a positive relationship was found between educational level and managers' attitudes towards Web and IT. In contrast, a significantly negative relationship between managers' attitudes and age and organizational experience was found. Finally, no significant relationships were found between managers' attitudes and gender.*

Keywords: Web usage, ICT, Online behaviour

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1. Introduction

Successful Information Technology Diffusion (ITD) can be dependent upon a variety of different factors that include technical, organizational, cultural and individual aspects [13, 13, 40, 48, 20, 45, 22, 54, 21, 23, 48, 34, 1, 55]. The utilization of the web has been addressed in many angles and focuses. The study of the web usage attitude is significant to understand the pattern as it enables further growth in the fields. This paper attempts to address some fundamental questions regarding the utilization of Web IT within a developing country context. The relationships between attitude and behavior are highlighted. Managers' attitudes towards IT are then explored by means of the Computer Attitude Scale (CAS) [37, 38, 39]. Finally, associations between these

attitudes and some managerial demographic characteristics (gender, age, organizational experience, and educational level are investigated. The domain web and its usage needs to be studied further and hence the present paper is an effort to study the web and the information technology domain, particularly the usage.

2. Managers Attitudes towards IT

2.1 Understanding and Measuring of Attitudes

Two themes of thinking have dominated the available literature in relation to the attitudes of people with respect to IT. The first theme deals with attitudes as a collection of three major components: the cognitive, affective and behavioral [49, 6, 51, 47]. The cognitive component is what a person believes about the object whether true or not. The affective component is the feeling what an individual has about the object; a feeling which influences his or her evaluation of this particular object. The behavioral component denotes the actual behavior of the individual in relation to this object [35]. Consideration of all these components and the inter-correlations between them are clearly very important. For instance, cognitive and affective components could determine the actual behavior, when people are free to act. However, this might not be the case when people do not have this freedom. In addition, having a positive attitude towards IT might not be enough to direct people's behavior towards using IT. Other factors like computer literacy and the availability of computers have a significant relationship with IT usage [60]. It is shown by some ITD studies that people are most likely not seen as an important part of this process [42, 10]. In such cases, the importance of actual behavior or the behavioral components of their attitudes is overestimated, while the cognitive and affective components of their attitudes are underestimated or not considered at all. In the long term, ignorance of both cognitive and affective components will negatively affect actual behavior and may create a resistant behavior pattern regarding IT implementation. As attitudes of people towards a particular object-reflect their beliefs and feelings regarding this object, clarification of these attitudes enables the recognition of both cognitive and affective components [9, 2]. One of the major contributions in this study is identification of both cognitive and affective components that could enhance the formulation of a successful IT implementation strategy.

The second theme deals with attitude in terms of measuring of factors such as: liking, anxiety, confidence, and usefulness of a particular object [62, 41, 38, 37]. Several attitude measurements have been developed, tested, and validated based on this classification [38, 37, 39]. The realization of these attributes could explain the individual's motivation regarding a particular behavior towards a particular object.

Thus, if we consider the social setting where an individual behaves and the cited benefits of the attitude object, we could say that attitude could be an appropriate predictor of an individual's behavior. Nevertheless, the context of a particular object has different elements and each of them has an impact on the individual's behavior. Thus, an individual's attitudes are best seen as *facilitate causes* for a particular behavior. Given the pervasiveness of IT use in today's world, it is likely that people will have developed some attitudes towards IT. Therefore, identification of the people's perception concerning IT applications should be well identified [15, 52].

2.2 The Characteristics of Individuals and ITD

Based on his review of the factors which affect an individual's attitude towards new technology, [4] argues that the formation of attitudes towards IT is affected by several aspects. Amongst these are the system of beliefs and values that shape an organization, age, gender, and cognitive ability. In general, [4] reports that younger people are more likely to have positive attitudes than their older counterparts. He also found that most of the available studies have indicated that males tend to display more positive attitudes towards IT than females regardless of their level of technological familiarity. On the other hand, female attitudes become more positive as the level of familiarity increases. Because of the challenging nature of technology, he found that low cognitive ability leads to negative attitudes towards IT. These findings taken together can justify over-representation of young men in IT applications.

Consequently, a better understanding of these characteristics may provide a basis for improving the way in which IT is diffused in organizations [24]. Human resource policies within an organization can support and facilitate the integration of organizational change and the introduction of a new technology [43]. As managers are the people who transform organizational strategies into actions and who deal with customers and clients directly [34, 57], it could be argued that the identification of their attitudes towards IT can enhance the development of appropriate human resource policies which serve as effective enablers for strategic ITD.

It could be argued that the managers' attitudes towards ITD within their organizations depend upon their own perception concerning the benefits or drawbacks of IT on their own work activities. These vary from one manager to another depending on the manager's own perspectives. The classification of managers according to their cultural layer or group could provide a valid source of information to develop organizational policies that consider all differences [12]. But how could we make this classification and utilize this understanding to formulate a successful ITD strategy? Our view is that we should start by establishing a common ground that enables us to classify managers into groups or subgroups and explore some relevant features shared by individuals in each group. For this purpose and after consideration of the available literature, five relevant characteristics were identified: gender, experience, age, and educational level. These aspects were used as cultural layers to classify the JGOs into several segments. Exploration of the relationships between these characteristics and attitudes of managers towards IT was expected to provide a rich source of data for the strategy formulation process.

2.3 The Formulation of the Conjectures

2.3.1 Managers' General Attitudes towards IT

[36] use the Socio-Technical System (STS) approach to clarify the importance of social aspects in the process of automation. The STS theory considers organisations as consisting of two interdependent systems. The first system is the technical system, which focuses on equipment and processes. The second system is the social system, which focuses on people perspectives and relationships within the organisation. Their study revealed significant conclusions. Management support for IT was found to explain about 24.1% of the success of automation. Consequently, investigation of the managers' perceptions in relation to IT implementation is an important issue and should not be underestimated.

In their study that investigates the experience of some developed countries, [20] claim that managers in developing countries are likely to resist imperatives such as information sharing and decentralized decision-making and this may affect the ITD within these countries. However, some factors, such as technological "*culturation*" [55] and technical training, may change the managers' view of IT. A study conducted by [55] in five Arab countries (including Jordan) revealed that a distinction should be made between the perception of upper-level managers to IT and that perception associated with lower-level managers and workers. They claim that upper level managers usually have optimistic attitudes to ITD because of the process of technological culturation that affects them. Nevertheless, it is argued that the vision of the lower managerial levels is more important than the formal strategies imposed by top management, since they are involved with the practical aspects of ITD because they hold the responsibility of the daily use of the new technology. We could argue that the culturation process has a great impact on the process of ITD in developing countries as most upper-level managers have gained their education from developed countries. Certainly, Jordan, and Arab countries in general, are not exceptions. Most importantly, noting the paucity of relevant academic research, no one can claim that formal plans relating to ITD that are developed by upper-level managers or ministers reflect the whole reality. In our view, ITD should be based on consideration of all the people who work or will be working with this technology. Therefore, this study provides a novel and valuable contribution through the exploration of the lower and middle line managers' attitudes towards IT. Formulated from the literature and based on general discussions with some of the practitioners prior to conducting the study, the following general conjecture was proposed:

Conjecture No. 1: Lower and middle line managers have generally positive attitudes towards web and IT.

2.3.2 Demographic Characteristics

2.3.2.1 Gender

Most of the available literature in Information System (IS) research has dealt with men and women as homogeneous entities in which distinctions of gender are either ignored or considered irrelevant [29]. In their study, which investigates the impact of gender on the use of information systems, they suggest that significant gender differences exist. For instance, women were found, on average, to be somewhat younger and less experienced than men with lower salaries and fewer opportunities to interact with people outside their departmental boundaries. The examination of [58] of low representation of females in computer studies leads him to conclude that males and females process information differently. He claims that not only do males have greater analytical and quantitative skills than females but also males have higher mathematical skills. Thus, he concludes that computer anxiety is more often associated with females. Two views that aim to explain this difference (if it exists) might be identified. The first is that the difference between males and females in relation to computer anxiety is due to the differences in their cognitive functions and their cognitive style. The second explains these differences as a result of a function of training and socialization more than inherent differences between males and females. Indeed, [58] noted that gender differences may be due to a number of reasons ranging from socialization, to brain functioning, to the level of exposure to arcade and computer games.

In contrast, other studies [39] report no meaningful gender differences concerning attitudes towards IT.

Nevertheless, [16] argues that new information communication technologies may be a powerful ally for women in organizations since the work of organizations will more and more depend on brain power. As a result, traditional barriers between men and women in organizations will be reduced. [33], in her analysis of methods used to examine gender differences in computer-related behavior revealed that, of the ninety-eight studies of attitude measurements, researchers found that forty eight studies showed males do have more positive attitudes towards IT; in fourteen occasions, females were found to have more positive attitudes; the remaining thirty-six studies, no differences were observed.

In some societies (such as “Arab” society) men tend to be more socially active in places where IT is accessible than women. This may create some differences in relation to their perception of IT use in general because men are more exposed to computer discussions and usage. Based on this, the following conjecture was proposed:

Conjecture No. 2: *Male managers have a more positive attitude than female managers towards IT.*

2.3.2.2 Organizational experience and age

Inexperienced users are expected to view IT as impersonal, unapproachable, complex, or dull, and require a high level of technical skill and computer knowledge [58]. Managers who have little or no organizational experience are expected to face computer literacy problems that could make them resist the use of IT [7]. It might also be argued that people who have considerable organizational experience are expected to resist the extensive use of IT They might view this resistance as a way of protecting themselves and their well established procedural knowledge which, in their view, might be at risk as a result of the expected IT power that will be available for all organizational members regardless their level of procedural knowledge.

Some writers have linked the experience with age and claim that older workers may fail to match the technical requirements of IT implementation such as sufficient computer literacy [32]. Accordingly, such writers expect to be laid off or displaced by younger and more experienced workers [43]. [58] emphasizes this assumption when he states that “*older people may be likely to view IT with suspicion and aversion, fearing replacement and displacement by them. They are likely to have had less exposure and knowledge of them than their younger counterparts*”. Based on this discussion, the following two conjectures are proposed:

Conjecture No.3: *The older the manager the lower his or her favorable attitude towards working with IT.*

Conjecture No. 4: *The greater the non-IT work experience, the lower his or her favorable attitudes towards working with IT.*

2.3.2.3 Level of education

Another important aspect that might affect managers’ attitudes towards ITD is the level of education. This characteristic aspect has received great attention in the last few years. For many researchers, education (technical education in particular) is the best way to reduce the level of computer anxiety among people. However, educational constraints may be more dominant in developing countries where people have fewer opportunities to experience higher education. Older people, in particular, may have lost their opportunity to gain higher education due to the unavailability of higher education institutions many years ago. For example, the first Jordanian university was established in 1962. Before that time a few, mainly rich, people had access to higher education abroad. Even with the availability of higher and technical education in some countries like Jordan, many people do not have the opportunity to gain this education due to the difficult financial circumstances and high educational fees. The situation may be different in other developed countries where education is widely available and at affordable cost. This, in turn, may create major differences between countries in relation to the impact of both age and educational level on ITD. Thus, it is not a surprise that some studies conducted in some developed countries [56] have found no significant relationships between education level or age in the one hand and intentions to adopt innovations. To explore this issue within the context of developing countries, the following conjecture was proposed:

Conjecture No. 5: *The higher the manager’s level of education the greater his or her favourable attitudes towards working with IT.*

3. Methodology

This study utilised a sample survey to explore and investigate the proposed conjectures. This method is a common approach to data collection and provides versatility, efficiency, and generalizability [51]. The method involves the application of a standardised

questionnaire to enable individuals to be placed on a dimension indicating the degree of favourability towards the object in question [6]. In addition, and to enhance the interpretation of the findings, six semi-structured interviews were conducted after initial analysis of the survey.

The data were analyzed using Statistical Package for Social Science (SPSS; Version 11.1). To test the cited conjectures, Exploratory Factor Analysis (EFA) was conducted to assure that the scale is measuring the same dimension (namely attitude of managers towards IT). EFA identifies relationships among variables that are often far from obvious in the original data [28]. It is a technique particularly suitable for analysing the patterns of complex, multidimensional relationships (Hair et al, 1995: 365). Bivariate analysis was undertaken to explore the relationships between the five demographic characteristics (gender, age, organizational experience, and educational level) on the one hand and the overall attitude scale and its subscales on the other hand. Then, bivariate analysis was extended by using General Linear Modelling (GLM). Attitude scores on the four dimensions (computer anxiety, computer confidence, computer liking, and computer usefulness) were summed and modelled on the five demographic characteristics. A graphical description of these relationships was made through the use of error bar charts.

3.1 The Instrument

Attitudes of lower and middle line managers in JGOs were measured using the Computer Attitude Scale (CAS) developed by [37]. The CAS measures attitude based on the following four subscales: (a) computer anxiety, (b) computer confidence, (c) computer liking, and (d) computer usefulness. For the purpose of this study these subscales were defined as follow:

a) Computer anxiety

The feeling of the individual concerning the uncertainty level of IT consequences.

b) Computer confidence

The feeling of the individual concerning his ability to use the object which is in this case his ability to use IT.

c) Computer liking

The general feeling of the individual concerning an object involving his or her emotional acceptance or rejection of this object.

d) Computer usefulness

The cognitive perception of an individual concerning the advantages and disadvantage of IT.

The validity and reliability of this scale has been well tested and evaluated in different studies [37, 51, 17]. A slightly modified version of the CAS was used to achieve the objectives of this study as well as to assess its conjectures. The instrument consists of 40 items with responses recorded on a four-point Likert scale. However, instead of four-point scales as in the original version, this study used a five-point scale to provide the participant with the opportunity of recording a neutral view and to reduce the number of missing values. It was felt that this would encourage a complete response and also provide more flexibility in analyzing the data. For each item, respondents were asked to express their agreement or disagreement with the item through selecting one of the following: strongly agree, agree, neutral, disagree, or strongly disagree.

The items are coded so that the higher the score, the more positive the attitude. Therefore, higher scores for confidence, liking and usefulness would indicate greater attending, whereas a higher anxiety score means less anxiety.

3.2 The sample

The sample for this study was drawn from a list of the Jordanian public service organizations. Jordan is a developing country that has started recently to explore the use of information and communication technologies to enhance the development of its economy and to achieve successful integration with the global environment. Jordan is similar to many developing countries in terms of its economic level of development and its limited or unutilized resources. In addition, it shares with other Arabic countries, its cultural, political, and social backgrounds. Lower and middle line managers in public service organizations were selected for investigating of the conjectures. Top level managers were excluded because of the difficulty in gaining access to them. In addition, carrying out a study that involves all managerial levels might lead to misleading results since the motivation of top managers might be different with their focus directed towards strategic rather than practical or operational activities.

Multi-stage stratified cluster sampling was used in this study to ensure good representation of the research context. The sampling frame consisted of a list of governmental organizations provided by the department of statistics (statistical Yearbook 2000). It included the 33 ministries, departments, and corporations that constitute the Jordanian government body. Since the

number of population (number of lower and middle line managers in JGOs)) was not available, the focus was directed towards the number of service organizations as a whole. The diversity of the selected organizations ensured that a good representation of service organizations was achieved. In selecting the most appropriate sample, two stages of sampling were conducted. The first stage was to choose the organizations where the study could be conducted. This was made through the use of stratified sampling, which enabled the classification of the population into discrete groups. According to this technique, the sampling frame is the complete list of clusters rather than the complete list of individuals within the population (complete list of Jordanian ministries). Based on this and considering the geographical distribution of the public organizations, 40 organizations were selected from different clusters that represent variety of public services: health, education, social security, finance, telecommunication, transportation, local, agriculture, legal, security, planning, public work and housing service. The representativeness of the sample was improved where regional distribution of these organizations enabled the consideration of regional differences. The second stage involved the selection of the people who were expected to participate in the study. At this stage, simple random technique was used and data was collected randomly from lower and middle line managers within the selected organizations. A total of 534 questionnaires were distributed over 3 month-period and 409 were collected. This represents a significantly high response rate (76.6%), with 83 females (20.3%) and 326 males (79.7%).

4. Data Analysis

4.1 Scale Testing

Cronbach's alpha test, a commonly used test of internal reliability, was employed to assure questionnaire reliability. This test measures the internal consistency of the items that measure the attitudes of managers based on the average inter-item correlation and assures that all items are homogeneous [11]. According to the test, $\alpha = 0.93$ which was considered an acceptable level of reliability [5]. This confirms that the forty items that make up the attitude scale are highly consistent and can be used to measure the same dimension, which is the attitude towards IT.

To confirm whether the four attitudes subscales were measuring the same construct (attitudes towards IT); the sums of four subscales were factor analysed. As each of the four subscales consists of an equal number of items, namely ten, the use of sums of these subscales seems appropriate to provide a reliable measure. Factor analysis of the four attitude subscales (table 1) showed that these subscales were loading on a single factor labelled as attitude towards IT.

	Attitude toward Computers
Sum of Anxiety	.865
Sum of Confidence	.898
Sum of Liking	.805
Sum of Usefulness	.870

Extraction Method : Principal Component Analysis

Table 1. Loading of the four attitude subscales on the attitude towards IT

Since this loading is based on the correlation between the four subscales, it indicates that the four subscales are highly related to each other.

The next section provides a detailed analysis of the attitudes of managers towards IT. Due to the compound number of variables involved and to facilitate understanding and presentation of this analysis, interpretation and explanation of the results are provided throughout the analysis stages.

4.2 Individual Conjectures Testing

4.2.1 General attitudes towards IT

The scale yields five measures: one for each subscale and a total score. Means of respondents' attitudes subscales and total scores are shown in table 2. As mentioned previously, higher mean scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

	Mean
Mean of Anxiety	4.10
Mean of Confidence	3.86
Mean of Liking	3.68
Mean of Usefulness	4.04
Mean of Attitude items	3.92

Table 2. Mean of attitude subscales and the overall scale

An examination of table 2 shows that means range lies between 3.68 (computer liking) and 4.10 (computer anxiety). More significantly, all means of attitude subscales and the overall scale lie above the 'neutral' position, which is 3.00. Consequently, the study revealed that middle and lower line managers in JGOs have positive attitudes towards IT. This confirms conjecture number 1 "*Lower and middle line managers have positive attitude towards IT*".

An explanation of the above results was provided by some participants who were interviewed through the field study. Six semi-structured interviews were conducted with managers from different organizations. The schedule of these interviews was determined based on an initial analysis of the questionnaire data. Training and education, technological "*culturation*", and psychological pressure were identified by the participants managers as that the most important factors that form the positive attitudes towards IT.

The participants have pointed out that public organizations are providing technical training for their staff including the use of word-processing, spreadsheets, and internet, which supports the establishment of ITD culture in the Jordanian society. Training and educational system play a very important role in creating technology culture. Jordanian universities have begun to support the creation of this culture through introducing computer courses and technical training to obtain the requirements of the new era. Families and the students alike have also become more interested in understanding IT. This strengthens the technology culture in the society. It has become well known, as one manager stressed, that getting a job needs both IT knowledge and familiarity with English language.

The impact of what so called technological "*culturation*" seems to be a very important factor that supports the use of technology where a good number of employees and managers have high degrees from foreign institutes or universities. One manager stressed that those people who have got the chance to get their education in technologically developed countries had and will have a positive impact in relation to the technology use within their organizations.

The third aspect that is very important to the formation of favorable attitudes towards IT is related to the psychological pressure on the public official to improve himself or herself in term of IT skills. Otherwise, his/her position will negatively be affected and he or she will become incompatible with the requirements of the new work environment that is being created as a result of the growing IT use. Consequently, interviewed managers emphasized that employees themselves are asking for more IT-related training.

4.2.2 Demographic Managerial Characteristics

Bivariate analysis was employed to identify the correlations between four demographic characteristics (age, education, and organizational experience) and the overall attitude scale. The sums of attitude items were used in this analysis to represent the overall participant score. Table 3 shows these relationships. As gender is classified into two discrete groups (male and female), difference, not correlation, between these groups according to the perception of IT should be assessed. This is explored in the next section using error bar, the GLM approaches and parameter estimates.

As shown in the above table, the correlations for both age and organizational experience are negative (-.126 and -.127 respectively). Accordingly, as both age and/ or organizational experience increases, respondents are more likely to have a negative attitude towards IT. Younger and less experienced managers have more positive attitudes towards IT. Returning to our conjecture number 3 concerning the relationship between attitudes of managers towards IT and their age [*Are there significant differences between attitudes of managers towards IT according to their ages?*], we conclude that a manager's age has a significant negative relationship with his or here attitudes towards IT.

		Sum of Attitudes
age groups	Correlation Coefficient Sig.(2-tailed)	-.126* .011
Organizational	Correlation Coefficient Sig.(2-tailed)	-.127* .010
Education Level	Correlation Coefficient Sig.(2-tailed)	.098* .048
Span of Control	Correlation Coefficient Sig.(2-tailed)	.001 .980

*.Correlation is significant at the .05 level (2-tailed)

Table 3. Correlation between the four demographic characteristics and the overall sum of attitude

These results contradict some other previous studies [29, 56, 3] that found no significant relationship between age and attitude towards IT. A justification of this contradiction is based on the research instrument each of these studies used and on the context of each particular study. Nevertheless, this study confirms the results of some other investigations that reached similar conclusions and claimed that older people might fail to match the technical requirements of IT usage [58, 32, 3].

In relation to the relationship between attitudes of managers towards IT and their number of managerial years of working experience and returning to our conjecture number 4 [*Are there significant differences between attitudes of managers towards IT according to the number of managerial years of working experience?*], we conclude that the number of manager's years of working experience has a significant negative relationship with his or her attitudes toward IT.

The encountered relationships between age and non-IT organizational experience on the one hand and lower and middle line managers' attitudes toward IT on the other hand can be due to the fact that older and more experienced people are likely to view the application of IT with suspicion and aversion, fearing replacement and displacement. They are likely to have had less exposure and knowledge of IT than their younger counterparts [58]. The formal or informal power which those people have may be at risk as greater technical knowledge and higher education level of younger and organizationally less experienced people will give them an advantage and enable them to understand in relatively short time the computerized system of procedures and organizational functions. In addition, managers who have long organizational experience may face IT literacy problems which can make them resist the use of IT [60, 32]. They also expect that the use of this technology will reduce the importance of their well established procedural knowledge gained throughout their long working experience. One manager pointed out that there may be some drawbacks if employees and managers do not have enough technical training. Some of them may feel threaten by this implementation, specifically old people. Another manger also stressed that most of the old managers have missed the opportunity of getting the technical knowledge during their education. Those are expected to be a major constraint and should be re-qualified.

In contrast, when the level of education increases, managers become more positive towards IT. As shown in table 3, relationship between educational level and managers' attitudes towards IT is statistically significant (.098). As a result, and returning to our conjecture number 5 [*Are there any significant relationship between the manager's level of education and his/her attitudes towards IT?*], we conclude that a manager's level of education has a significant positive relationship with his or her attitudes towards IT.

The highly educated nature of Jordanian society and the government's extensive efforts in the last few years to raise the level of technical knowledge through intensive technical training as a part of preparation of organizations to introduce networking and modern technology may explain the encountered results concerning the relationships between level of education and managers attitudes towards IT.

4.3 Classification of Attitude Subscales

Further Bivariate analysis was conducted to explore the relationships between each of the different subscales of attitudes and demographic characteristics (table 4).

		Sum of Anxiety	Sum of Confidence	Sum of Liking	Sum of Usefulness
age groups	Pearson Correlation Sig.(2-tailed)	-.082* .098	-.129* .009	-.099* .045	-.106* .033
Organizational	Pearson Correlation Sig.(2-tailed)	-.106* .032	-.135* .006	-.112* .024	-.112* .024
Education Level	Pearson Correlation Sig.(2-tailed)	.064 .193	.056 .257	.007 .887	.158** .001
Span of Control	Pearson Correlation Sig.(2-tailed)	.021 .673	-.018 .722	-.003 .959	-.006 .907

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

Table 4. Correlations between sums of subscales, overall scale and the four demographic characteristics

This analysis allows us to identify and assess which subscale of attitudes is associated with which characteristics. Interestingly, concerning the positive relationship between the characteristic level of education and attitudes towards IT that was noted previously, the current findings indicates that this positive relationship is attributed to one specific subscale of attitudes - usefulness. Moreover, this relationship is highly significance. In contrast, in relation to the previously noted significant negative relationship between the characteristic organizational experience and attitudes towards IT, the current findings indicate that all four subscales of attitude are significantly associated with organizational experience. Indeed, computer confidence has the highest association.

Finally, in relation to the characteristic age, the current findings are similar to those for organizational experience in that three subscales including computer confidence, computer liking and computer usefulness are significantly associated with this characteristic. Again, computer confidence has the highest association. In contrast, computer anxiety is not significantly associated with age.

The above findings indicates that highly educated managers view the application of IT differently and realise the benefits of technology more than less educated managers. These findings confirm that managers' cognitive perception of IT benefits is an important aspect which determines their attitudes towards IT. It also confirms that the benefits of IT have also been recognised by the managers and this develops favourable attitudes towards IT, one manager states that:

"IT will improve our services and help us to keep contact with other organizations. It will also reduce paper work, improve organizational efficiency, reduce the time needed to provide our services and increase the accuracy of our work".

To assess the differences between attitudes of managers according to their gender and to confirm the above bivariate analysis concerning the relationships between attitudes of managers and their age, organizational experience, and educational level, error bar charts were obtained. An error bar chart is a graphic way of summarizing the mean scores together with 95% confidence intervals for a group of variables. The use of error bars provides a general description concerning the varying associations between the four attitudes subscales and the five demographic characteristics (gender, age, education, and organizational experience).

As seen in figure 1, it is observed that no significant differences were found between male and female participants in terms of both computer anxiety and computer confidence. Nonetheless, female participants were found to have higher average liking scores and slightly lower average usefulness scores than males. Therefore, we conclude that our conjecture number 2 [*Male managers have a more positive attitude than female managers towards IT*] is partially rejected.

Accordingly, the results concerning gender differences provide a confirmation for other studies that reached similar conclusions indicating the similarity between male and female in relations to their general attitudes towards IT as well as their ability to

perform IT applications [39, 25, 16]. However, contradictory results were obtained when comparing these results with some other studies that emphasized the existence of some differences between male and female in relation to their attitude towards IT and their ability to work with and learn IT applications [58, 29, 3].

The use of basic IT applications within the organizations for secretarial work might justify having higher computer liking scores by female managers than their male counterparts since secretarial work is normally performed by females who, as a result, get familiar with the use of IT in general.

Classification of participants according to their age groups shows that older managers, in general, have lower scores than their younger counterparts on the four attitudes sub-scales (see figure 2). In particular, managers whom their ages range from 20-39 were found to have the higher scores on all attitudes sub-scales.

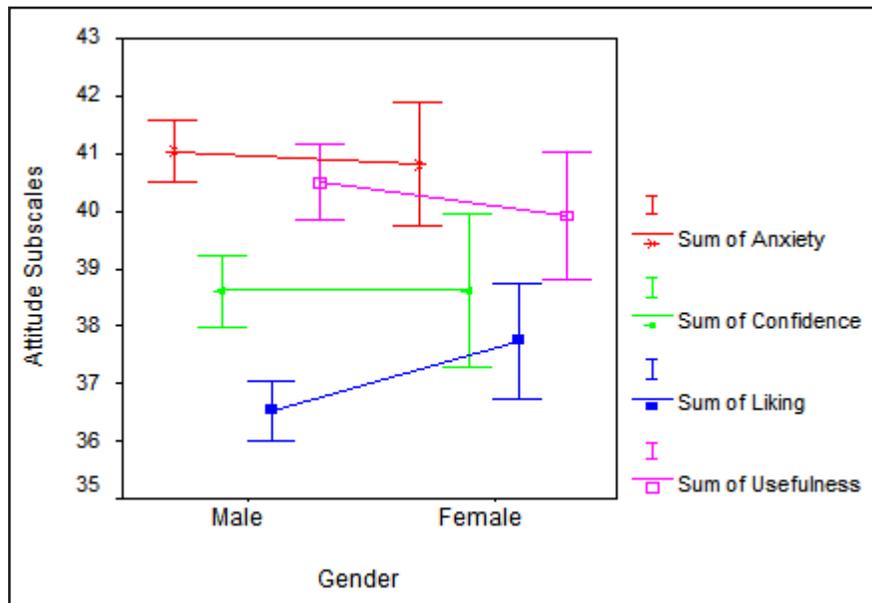


Figure 1. Gender and attitude subscales error bar

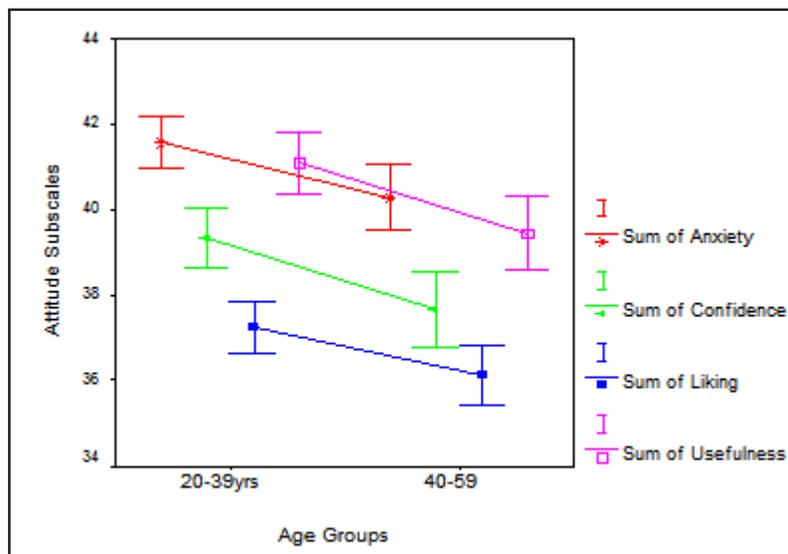


Figure 2. Age and attitudes subscales error bar

Concerning the organizational experience, it was revealed that the most experienced managers (20 years of employment or more)

have lower scores than their less experienced managers on the four attitudes subscales (see figure 3).

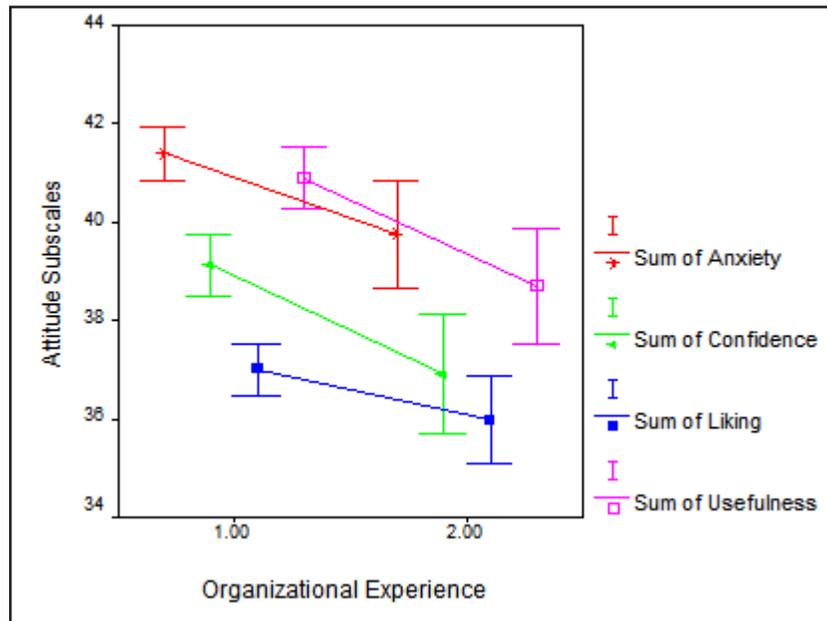


Figure 3. Organizational experience and attitudes error bar

In relation to the managers' level of education, it was confirmed that the higher the level of manager education, the higher his or her score on computer usefulness in particular (see figure 4).

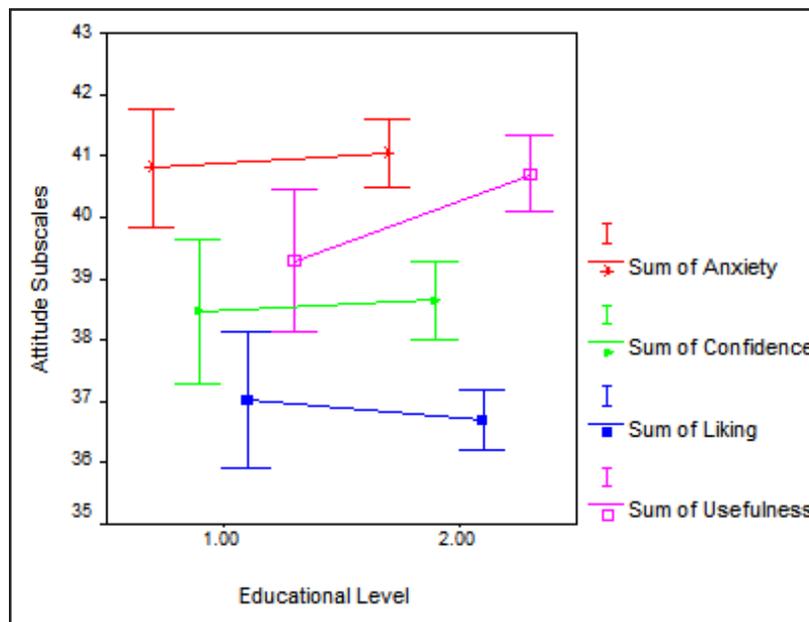


Figure 4. Educational level and attitude subscales error bar

The use of error bars enabled the classification and assessment of attitudes subscales and provided a general graphical description of the direction of their relationships with the five demographic characteristics. Nonetheless, a detailed description of these correlations and the differences among managers with reference to their gender, age, organizational experience, and educational level requires further considerations and thoughts. Therefore, GLM was necessary to explore and validate these relationships and differences in some details and to identify the significant and non-significant relationships among them.

4.5 General Linear Model

An extension of the above analysis was made through the use of GLM. The GLM allows us to summarize a wide variety of research outcomes as well as to break down our analysis of both attitudes of managers and their demographic characteristics. GLM is a statistical method that is used to define the correlation between two variables or a group of variables with adjusting for or excluding the effect of other variables within the data set. The use of this method in particular enabled examination of the effect of each demographic characteristic on each attitude subscale adjusted for the effect of the remaining subscales. This, in turn, not only provided a confirmation of the results of the previous bivariate analysis, but also excluded the impact of other subscales when measuring the relationship of each of them with the demographic characteristics.

Based on the result of GLM (see table 5), manager’s age was confirmed as having significant relationships with computer usefulness, computer confidence, computer anxiety and computer liking respectively. The significance level shown in the above table indicates the effect of each demographic variable on the attitude variance for each attitude subscale with adjusting for other subscales. Unlike previous bivariate analysis noted earlier, computer anxiety is significantly associated with age characteristic.

Demographic Characteristics	Mean of attitude Subscales	Sig.
Gender	Mean of Anxiety	.674
	Mean of Confidence	.733
	Mean of Liking	.069
	Mean of Usefulness	.458
Ages	Mean of Anxiety	.008
	Mean of Confidence	.004
	Mean of Liking	.083
	Mean of Usefulness	.003
Organizational experience	Mean of Anxiety	.019
	Mean of Confidence	.005
	Mean of Liking	.079
	Mean of Usefulness	.009
Educational level	Mean of Anxiety	.233
	Mean of Confidence	.255
	Mean of Liking	.181
	Mean of Usefulness	.001

Table 5. GLM for demographic characteristics and attitude subscales

The outcomes of GLM also revealed a significant yet weak relationship between gender and computer liking in particular. Female managers were found to have slightly higher average liking scores than their male counterparts. Otherwise, no differences were found between male and female managers. Indeed, no differences were found between the current findings and bivariate analysis noted earlier.

5. Contextual Recommendations and Implications for ITD

The quantitative findings of this research concerning the managers’ perception of IT present an optimistic view of organizational environment. Lower and middle line managers within JGOs were found to have favourable attitudes towards IT. Accordingly, strategy makers should consider the consultation of managers on different organizational levels and should enrich the role of lower and middle line managers in the strategy formation process. The direct control of those managers on the operational and day-to-day activities of the organization makes them champions leaders who are seen as role models for other employees under their supervision. Those leaders are described by [22] as electronic-champion or small groups of electronic-champions who have the vision to transfer ITD strategy into practice and give direction to this strategy. The creation of top-middle-down management partnership is seen as a potential strategy to support and enrich the role of lower and middle line managers. This

requires a continuous communication and an effective reporting mechanism to link all managerial level not only within a particular organizational context but also between all organizations that belong to the same ministry. According to [18], a key to the success of an e-government strategy will be a network of open communication, a combination of sharing and listening flowing both horizontally and vertically throughout the organisation. This can not be obtained without a supportive and participative operational management which, as the findings of this research revealed, is underdevelopment. Top management on the ministerial level should provide further encouragement for this positive trend through granting greater responsibilities to front line staff and managers to provide in-time customised services.

Moreover, and considering the favourable attitudes of managers' towards IT, public management engagement in technology issues is seen as a crucial aspect of IT implementation and can enable the creation of an appropriate organizational atmosphere where the use of IT is encouraged and supported through identification of challenges and reducing staff resistance to change [46, 53]. Managers who have positive attitudes towards IT can encourage other organizational members to accept the use of IT in performing their daily activities. The collectivist nature of Arab culture and the importance of building and maintaining good relationships with others enable managers to positively influence their subordinates' perception of IT.

Furthermore, the findings of this study emphasized the importance of some demographic characteristics including age, organizational experience, and education in the formulation of managers' perception of IT. The observed differences regarding managers' attitudes towards IT according to their age, organizational experience and educational level suggest the use of a different strategy which considers the differences between managers in relation to their age, organizational experience and educational level. This strategy provides more consideration to older, more experienced, and less educated managers. This involves providing not only more technical training for older and less experienced managers, but also involving them in developing ITD strategy within their organizations to motivate them and improve their understanding the benefits of IT which reduces the level of uncertainty [44]. The process of improving the managerial and organizational qualifications of public managers should be an ongoing process in addition to the essential technical training.

Although the results concerning attitudinal differences between male and female managers seem encouraging, other ITD and gender related issues should be emphasized. These include access to technology, the percentage of women from the total labor power and types of education and training provided to women. In terms of access to technology, women internet users are under-represented in the Arab region. For instance, women constitute 6 percent of the total internet users in Jordan [19]. According to the United Nations Conference on Trade and Development (2002), when women do have access to IT in developing countries, it is usually in the workplace which involves the use of IT by women as a tool of production (e.g. routine office work, data entry, and programming) rather than as a tool of communication (e.g. creation and exchange of information). The access to internet technology in particular should be improved to increase the participation of women in the process of ITD in their organizations. With reference to the percentage of women from the total Jordanian labour force, it was 23% in 1998 comparing with 15% in 1980 (the World Development Report 1999/2000). However, this percentage, if compared with other countries (even some developing countries) is still very low. Considering the favourable attitudes of participants and the similarity between male and female managers in relation to their attitudes towards IT, strategy makers should consider increasing of the percentage of women from the total labour force. This can be made through empowerment of women especially in the sectors of education and health where women constitute a relatively large percentage and have greater potential for development and employment in these important Jordanian sectors.

The government approach which is currently focusing on providing technical training to accelerate the process of ITD and to create IT supportive culture within the public sector context is not adequate to ensure the success of ITD. Training of public managers should be extended to understand and communicate the nature of the new services they are providing and of the logic of the organizational changes made to support the delivery of these services [50]. In addition to technical training, managerial and organizational development should be considered. Strategy makers should recognise that the work of public servants needs to be managerial rather than administrative. This involves a change from following instructions to achievement of results and taking personal responsibility [27]. Developing management skills needs more consideration to enable this transformation. The findings of this research concerning both managerial and attitudinal dimensions have shown some positive trends on the operational and middle management levels towards supporting the view of public sector as managerial rather than administrative entity. They overall proved the readiness of public managers to incorporate the traditional model of administration with the new model of management described in developed countries literature where IT has been considered as a major driving force towards this incorporation.

Overall, this research is considered as an attempt to avoid technical orientation and impersonal perception of the current ITD strategies. It invites strategy makers to consider users' perspectives regarding the diffusion process. This issue seems more important in developing countries' context where technology is being transferred so rapidly and the internal organizational setting is almost missed out. Therefore, the findings of this research can be of interest to other countries mainly because we have tried to put some elements of the NMP into practice and also to assess the existence of some other traditional managerial practices. Eventually, this research can be seen as an important step to understand the interaction between technology and organizational context.

6. Conclusion

A review of the available literature confirms that this study is the first in-depth study within the Jordanian context concerning the attitudes of managers towards IT. Additionally, managers' attitudes towards IT was narrowed down through classification of managers according to their gender, age, organizational experience, and educational level. Some of these characteristics (non-technical organizational experience) have received little attention in the previous studies. Attitudes of managers' were also classified in terms of computer anxiety, computer confidence, computer liking, and computer usefulness. The interaction between these aspects of the study was explored using in-depth and multiple analytical methods. The results of this analysis emphasize that managers' perspectives concerning the use of IT vary according to their age, organizational experience and education. Therefore, any diffusion strategy should consider such differences through focusing on promoting of older, more experienced and less educated managers' attitudes towards IT.

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