The Impacts Factors of Using The Smartphone at Work Environments in Developing Countries: The Case of Saudi Arabia

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Abstract—Smartphones are now an integral part of people's daily life activities due to their advanced features. While this ostensibly offers great convenience, it also entails great psychological challenges due to the constant ubiquity of information to which users are exposed, particularly with regard to work environments. Smartphones and anytime, anywhere connectivity have caused the sphere of work to spill over into the realm of private life, and vice-versa. This study explores the impact of using smartphones in the work environment, primarily focusing on Saudi organizations as a case study representative of developing countries with high smartphone penetration. Open-ended interviews were conducted with 54 managers from different organizations in Saudi Arabia. Analysis of the results revealed that performance and regulations were the main factors that affected the use of smartphone in work environments, which is helping to gain a better understanding of current challenges facing many organizations.

Keywords- Management Information Systems; Smartphones; Management; Information Technology; Employee Performance.

I. INTRODUCTION

Smartphones are a fundamentally important tool in the daily lives of employees [1], used to make calls, search for information, socialize with colleagues and manage daily events [2,3]. Smartphone technologies brought many functionalities previously limited to desktop computers within the purview of easy hand-held use, including email and web browsing, as well as camera features facilitating massive changes in the uses of photography (e.g. face recognition security) [4]. All of these capabilities accelerate the integration of users with the networked world in the internet of things [4]. While most of these developments have been consumer-driven, their effects include changes to the ways in which employees relate to their organizations; while once a futuristic vision [5], the anytime, anywhere accessibility of the internet and thus of employees has obliterated traditional divisions between work and home life, with both positive and negative results for employees themselves and for organizations [1]. The variation of smartphone's feature and functionality is taking a place nowadays in improving any business or in managerial or employees roles of the organizations. The advantages are obvious in terms of increased productivity (in the short-term at least), improved decision making and increased efficiency of communication within and between organizations.

Developing countries have been particularly rapid in their adoption of smartphones and their use in professional contexts, with impacts on mobile application developing companies, smartphone vendors, internet service providers and other sectors that utilize the smartphone to use it in the daily lives, and most businesses have incorporated smartphone use as an integral part of their operations, whether by design of the natural result of employee behavior, enabling improved customer services and performance monitoring [6]. Negative impacts include that 65% of employees were found to use smartphones to do their daily activities, such as reading news, updating their status, reading messages, posting photos and other activities; for employees, this is part of the same general intensification of communications whereby they are also increasing expected to respond to work-related emails immediately, even after working hours [7].

While ostensibly the use of smartphones for work purposes should facilitate more efficient task completion, particularly in terms of email communication, in fact a marked increase in stress has arisen as a result of eroding the traditional work-life balance. This includes employees accessing irrelevant content

(e.g. non-work-related social media activities) while at work, in addition to the opposite effect of extending working hours into private life (e.g. responding to work-related emails) [8].

Several qualitative studies have been conducted to try to explore the effect of mobile devices on business professionals [1], but few studies have addressed the impact of using smartphones on professionals in Saudi Arabia. Previous IT usage researches have classified the purpose and activities of using smartphones in the work environment as: information activities (e.g. using email, searching for information, conducting financial transactions, personal activities etc.) [9]; entertainment-related activities (e.g. playing games, watching videos etc.) [10]; and social relationship-related activities (e.g. chatting, e-mailing, calling, using social network and application etc.) [11].

The next section, the research methodology and data collection methods are explained. In the findings and discussion section, interview responses are summarized and the main results are discussed. Finally, the conclusion is presented with directions for further study.

II. METHODOLOGY

A. Aim of the Study

The main aim of this paper is to find out the main factors in the use of smartphones in work environments in Saudi companies.

B. Approach

This study employed a qualitative approach [18] to discover the positive and negative impacts of using smartphones and their effect on working environments. A series of interviews were conducted to address the themes identified. Interviews with open-ended questions were conducted with different random participants chosen from managerial positions in Saudi organizations, all of whom had at least one smartphone. The interview questions were designed and validated based on previous studies investigating the same context as defined in this research study [18, 20]. Prior to conducting the main interviews, a pilot test was conducted by distributing the questions to specialized experts and academics in this field of study to investigate the suitability of the proposed questions with the aim of this research study. The participants in the pilot study (n=8) were selected randomly from different organizations. The feedback was positive, with minor changes suggested (and adopted) to clarify some questions.

The questions were distributed to 13 organizations, including 54 managers, who participated in the interview. In order to define the scope and target of the research, an e-mail was sent to a list of participants which obtained from different kinds of organizations in Saudi Arabia. Each interview was audio recorded (with participants' permission) in order to ensure comprehensive recall of data, and the researcher made some additional notes during the interviews. Each interview lasted approximately one hour. At the end of each interview a report was written that compiled all the results. Once all the interviews were finished, a final interview document was prepared. In terms of analyzing the data, the descriptive analysis approach was used, as the questions were open-ended

in nature. The tool for investigating and analyzing the results was Microsoft Excel.

Coding theory was applied in order to define and categorize the results and derive the frequencies with respect for each category or theme [21]. The results were analyzed and they are presented in the results section.

C. Sample

In this study all participants (n = 54, managers) were chosen randomly from 13 indoor organizations, including public and private firms.

III. RESULTS AND DISCUSSION

In order to identify the main impact of using the smartphone during work processes, a coding schema was applied by which to categorize the 54 participants' answers according to general themes [12]. Once the themes were classified, the frequencies of the responses were coded and calculated, as shown in table I. Two general themes were categorized: performance and regulations. Each theme had two nodes: performance had positivity and negativity, and regulation had security and safety. Furthermore, sub-nodes were identified for the performance theme's nodes, whereby positivity node has four sub-nodes (availability, sociality, knowledge, and work completion) and negatively node has four sub-nodes (waste time, accuracy, productivity and respect) (figure I).

TABLE I. THE GENERAL THEMES FOR THE IMPACT OF SMARTPHONE ON WORK ENVIRONMENT

Themes	Frequency	Percentage
Performance	54	100%
Regulations	14	26%

Figure 1. Categorization of themes, nodes and sub-nodes

The five open-ended questions used in the interviews are presented below:

Q1: what are the positive impacts of using smartphone in your work environments?

Q2: what are the negative impacts of using smartphone in your work environments?

Q3: what are the regulations for using smartphone in your work environments?

Q4: what are the possible threats of using smartphone in your work environments?

Q5: what are the risks of using smartphone in your work environments?

The following section discusses the results and presents the impact of each theme on using the smartphone in work environments, as well as the nodes and sub-nodes of the themes explained by presenting the percentage based on the participants' answers.

A. Performance

The first theme is performance, which was represented by the first two questions (Q1 and Q2). The greatest response was attributed to this theme, with 54 managers (100%) (table I). Consequently, all managers noticed that employee performance was strongly affected by using smartphones in the work environment; accordingly, negative and positive impacts were categorized and presented as nodes of performance. Both positive and negative impacts were cited by 54 participants (100%) (table II), but they differed in the frequencies of the sub-nodes, as explained in the following subsections.

TABLE II.   THE NODES OF PERFORMANCE THEME

Performance (frequency (54), percentage (100%))		
Nodes	Frequency	Percentage
Positivity	54	100%
Negativity	54	100%

1) Positive impacts

Based on previous studies, using smartphones might bring out many benefits, such as increased productivity, efficient communication and collaboration, and enhanced performance [13]. In this study, further positive impacts were found, collected from the different answers of the managers. These positive impacts were classified into four sub-nodes which come under the positive impact node. These sub-nodes (reachability, sociality, knowledge, and work completion) (table III) are discussed below.

TABLE III.   THE SUB-NODES RESULTS OF POSITIVE NODE

Positively (frequency (54), percentage (100%))		
Sub-nodes	Frequency	Percentage
Availability	29	54%
Sociality	47	87%
Knowledge	12	22%
Work completion	16	30%

a) Availability

Authors in [1] found that the continuous engagement of employees with smartphones and technology allows them to associate with work from different places and time. In this study, 54% of the managers affirmed that smartphones increase the availability of personnel, as shown in table (III). This clearly relates to the inherent attribute of smartphones in improving communications, in this instance between the organization (i.e. work) and employees (outside conventional working times and places). This availability comes as contact on call, massages, email or specific applications. Furthermore, this result reflects private sector organizations that require employees to maintain contact with customers or managers beyond traditional expectations. However, these results in employees being negatively affected by the intrusion of work into their private lives.

b) Sociality

Authors in [4] found that smartphones have created new connections and communications that help and manage organizational employees to collaborate and communicate with each other, either inside or outside the firm. In this sub-node, 87% of managers' answers supported that sociality was increased by using the smartphone with different social applications to keep in contact with each other, which is shown in table III. Many approaches are used to achieve contact, such as creating social groups to receive and send messages or the use of multimedia between employees working in the organization in professional or social contexts.

c) Knowledge

The sub-node of using the smartphone included the knowledge intensity, which affected the professional service in firms, supporting [14]. The study proves that employees have positive access to real-time information, which provides features and functionalities to complete and support their tasks more efficiently within the work environment. However, only 22% of managers, as illustrated in table III, reported that employees were using the smartphone to gain skills based on the knowledge of using the smartphone to efficiently respond to market and demand changes. Moreover, this improved employees' knowledge related to the work task, which increased the learnability of the employees to complete their works in a professional way.

d) *Work Completion*

Many studies have identified the effects of using the smartphone to increase productivity and complete work. Authors in [15] found that smartphones have a significant impact on job performance. Furthermore, Authors in [15] identified that productivity is increased by improving the response time in using the smartphone to complete work. This also connects employees to work from different locations and time periods, which increases their number of working hours in terms of completing tasks related to work. Authors in [4]found that smartphones help employees to increase their thinking and creativity regarding work tasks by creating new communication channels between employees, which helps expedite their task completion in numerous circumstances. Smartphones are acknowledged to essentially increase the number of working hours spent by employees in completing tasks related to their work.

As shown in table III, 30% of managers affirmed that employees use smartphones to complete their work by increasing working hours, in-line with the studies cited above. Furthermore, using specific mobile applications on smartphones these days was noted to increase productivity, especially in private sector organizations, representing the most important positive impact of using smartphones. Employees depend on these mobile applications to create virtual work environments, which helps them to complete their tasks outside conventional working hours by accessing the company's website and data, which can facilitate greater efficiency and flexibility but which also erodes traditional concepts of work-life balance.

2) *Negative impacts*

Based on previous studies, while using the smartphone in the workplace, many negative impacts might result in undesired outcomes, such as increased stress, task interruption, and information overload [16]. In this study, further negative impacts were found, which have been collected from the different answers of the managers. These negative impacts were classified in to four sub-nodes which come under the negative impact node. These sub-nodes (waste time, accuracy, productivity, and respect) (table IV) are discussed below.

TABLE IV.   THE SUB-NODES RESULTS OF NEGATIVE NODE

Negatively (frequency (54), percentage (100%))		
Sub-nodes	Frequency	Percentage
Waste time	42	78%
Accuracy	37	69%
Productivity	38	70%
Respect	14	26%

a) *Waste time*

The results identified in table (IV) show that 78% of employees are engaged with their own smartphone, and they waste more time during work. Furthermore, the managers have given the answer that the majority of employees, who work ether in public and in private organizations are wasting time in using the smartphone to engage with answering personal calls, checking news or engaging in social media. However, such effects are discussed in detail under another sub-node (productivity); in itself, wasting time causes delay in task completion and disrupts organizational workflow.

b) *Accuracy*

A large majority (69%) of employees commit mistakes in processing their work as a result of engaging with their smartphones. However, many answers agreed that the mistake and error are strongly related with using the smartphone and losing the concentration during work, which makes employees have more mistakes, including both critical and normal mistakes. Furthermore, this sub-node is strongly related to the sub-node work completion, with more in work tasks and less completion ultimately arising from smartphone use, related to reduced accuracy and lower productivity.

c) *Productivity*

Authors in [17] demonstrated empirically that smartphone use can negatively affect productivity; this was supported by the current study, where 70% of managers thought smartphone use directly affected the work environment negatively. This sub-node identified that decreased level of productively cause's employees to postpone their work task to the next day, delaying whole work activities throughout the organization, including tasks that have to be completed within specific times, which undermines the performance of the whole organization.

d) *Respect*

Over a quarter (26%) of managers cited the sub-node of respect, noting many complaints from clients related to employee engagement with smartphones when they ought to be engaging with client service, reducing client satisfaction with the service at hand and general produce quality. Furthermore, many managers also complained of employees being distracted by their smartphones during formal meetings within the organization, reflecting irresponsibility and a lack of respect for the organization, management and other employees. This affected the aim of the meeting as well as affected the process of organization improvements by missing many critical aspects related to work or by disability to communicate and join teams with appropriate feedback and ideas.

3) *Regulations*

The second theme was regulations, represented by questions Q3, Q4 and Q5. 14 managers have participated in this theme (26%) (table V). The results show the responses from mangers with different organizations, which means some managers have noticed that the regulations of the organization are affected by smartphone use in the work environment, including in terms of security (n=11, 79%) and safety (n=7, 50%), which are categorized and presented as nodes of regulations. The two nodes are discussed below.

TABLE V.   THE RESULTS OF REGULATION'S NODES

Regulations (frequency (14), percentage (26%))		
Node	Frequency	Percentage
Security	11	79%
Safety	7	50%

a) Security

Some research has identified the effects of the smartphone on security. Smartphone and mobile applications have become a new channel for criminal attacks. In some cases, employees themselves might use some mobile applications to edit and change the genuine content to their version of the content [18]. The results of this study identified that there is a lack of using regulations to control the security in public and private organizations. Only 11 managers out of 54 mentioned regulation in their answers, with 79% out of 26% in the regulation theme (table V). Those managers mentioned the serious implications of using smartphones in the work environment pertaining to data protection (i.e. many organizations use a protection application to control the use of the information and keep the information safe from hackers or malicious use). Managers mentioned that the new technology used these days has huge dangers for information, and employees who used smartphones to take pictures, scan documents or sign in to their accounts in the organizations gave a route for some attacks and unauthorized access to organizational information. However, few mangers raised such issues relative to the total number of participants. On the other hand, organizations that applied strict regulations have less threats and higher data protection that accounts for any potential threat from potential threats arising from employee smartphone use.

b) Safety

Very few managers (n=7) answered this question, comprising 50% of the 26% in the regulation theme (table V). This node was related to some cases of organizations in which the use of smartphones poses direct challenges to life or health, such as for employees working in oil refineries or armaments. The smartphone is an electric device that might in some cases explode or cause explosions so strict regulation must be applied when such dangers exist. However, such organizations apply stringent regulations and ensure the minimal possible level of risk, making this a negligible concern relating to smartphone use.

IV.   CONCLUSION AND FURTHER STUDY

This study represents an important step in understanding the main factors germane to smartphone use by employees in Saudi public and private working environments. Further factors have been identified in this study, which can be concluded and categorized under two general themes: performance and regulation. The results provide support for employees using smartphones in work-related activities while at work having both positive and negative impacts. Positive impacts include increased work hours, which mean increased work complications, as well as increased availability, sociality and knowledge of employees. However, the negative impacts of smartphone use included increased time wasted, which directly undermines work efficiency and employee productivity. Furthermore, the results showed that the level of accuracy, productivity and respect has been decreased by smartphone use at work, which negatively affects the workplace culture as well as productivity. Regarding regulation, the results conclude that there are serious risks to both security and safety in many organizations. Moreover, the results also showed that only a slight number of organizations apply the regulations of using the personal smartphone in the work environment, which will affect data protection and employees' health and safety.

The majority of organizations need to conduct and activate new regulations to deal with the new technology and new type of risks. Further research needs to be conducted in order to fully understand the further factors on the effect of using smartphone and new technologies that might have an impact on work activity. Furthermore, more studies are needed to compare the impact of using smartphones in public and private organizations in developing countries.

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