Examining the Effect of Cognitive Style in Individuals' Technology Use Decision Making

دراسة اثر النمط المعرفي على اتخاذ الأفراد القرارات المتعلقة باستخدام التكنولوجيا

Case study on United Nations Relief and Works Agency (UNRWA) (for Palestine Refugees in the Near East) newly appointed secretaries in education field

Manar A. Hassan
UNRWA, Gaza, Palestine
1. Introduction

Investigations of technology acceptance by target users have received considerable attention from information systems (IS) researchers and practitioners. Several theoretical models and frameworks attempt to explain or predict a person's decision to accept a new technology. Of particular prevalence are the self-efficacy theory (SET) (Bandura, 1977), the technology acceptance model (TAM) (Davis, 1989), the theory of planned behavior (TPB) (Ajzen, 1991), the innovation diffusion theory (IDT) (Rogers, 1995), and style/involvement model (SIM) (Doong & Wang, 2008). A review of extant literature suggests a common focus on the effects of individual characteristics, such as self-efficacy (Compeau & Higgins, 1995), innovativeness (Agarwal & Prasad, 1998), age (Morris & Venkatesh, 2000), intrinsic motivation, anxiety (Moore, 2002) and gender (Adnan & Others, 2009). The cumulative evidence from prior research suggests that these characteristics can affect people's attitudinal beliefs, perceptions, and assessments of a new technology. According to cognitive appraisal theory (CAT), individual cognitive traits, the social environment, and information use can affect a person's interpretation of an ambiguous environment (Skinner, 1995). Results from prior studies show that cognitive style can affect a person's decision-making and behavior significantly e.g., (Hunt & Others, 2004) and (Chilton & Others, 2005). Conceivably, people vary in their cognitive style, and such differences may influence their technology acceptance decision making.

Accordingly, it is important to investigate the relationship between cognitive style and technology acceptance decision making. Equipped with a better understanding of that relationship, technology professionals and
business managers could design more effective training programs or management interventions to foster technology acceptance among targeted users.

We propose a factor (variance) model to explain individuals’ acceptance of a new technology. Our model incorporates the effects of cognitive style and will be tested empirically using evaluative responses from 428 newly appointed secretaries in education field of UNRWA. The technology we study is Microsoft (MS) ACCESS™, a commonly available database technology capable of addressing our subjects' data management needs at work or school e.g., school assignments, and organizing data/information of interest.

1. Literature Review

(Doong & Wang, 2008), applied Foxall's style/involvement model (SIM) to reveal the relationship between users' unique cognitive styles and their E-Negotiation Systems (ENS) future use intentions. The theoretical model was tested using empirical data collected from an online laboratory experiment involving 92 subjects. Findings confirmed that underlying differences in individuals' adaptive- innovative styles and involvement levels were associated with significant differences in their future use intention towards ENSs. More specifically, more- involved innovators reported the highest future use intention towards ENSs among the four segments. This study not only extends the IS research stream of cognitive style in the context of ENS, but also broadens the knowledge of cognitive styles in the context of
information systems by introducing a SIM that has been well examined in the disciplines of social psychology and marketing.

(Latvia, 2009), empirically tests a theoretical model to examine the effects of individual’s cognitive style on user acceptance of blogs and podcasts (blogs and podcasts are emerging Web technologies that have been adopted by educators to facilitate on-campus and distance education). It incorporates a course blog and series of lecture podcasts in a Web programming course and collected students’ feedback on the technology usage. Empirical findings suggest that individual’s cognitive style has significant effects on user acceptance of blogs and podcasts. However, students with innovative cognitive style are more likely to perceive these technologies as useful and easy-to-use as compared to their adaptor counterparts. Also, innovators perceive podcasts as more useful than blog whilst blog as more easy-to-use than podcasts.

2. Research Model and Hypothesis

Our research model, which developed and used by (Chakraborty & Others, 2008), extends the TAM by incorporating the adaption–innovation theory, as well as other constructs important to the targeted user acceptance phenomenon. We will empirically test the model using evaluative responses by newly appointed secretaries in education field of UNRWA. The particular technology under examination is MS ACCESS™, which we chose because it is both commonly available and relevant to this population of subjects. According to our analysis, most subjects have various data management needs that can be adequately addressed by this technology, which is generally available at work or school.
As shown in Fig. 1 (Chakraborty & Others, 2008), our research model states that an individual's actual use of a technology can be explained jointly by perceived usefulness and subjective norms. Although voluntary technology acceptance can be measured by intention to use the technology, we target actual technology use and examine the direct effects of its key determinants rather than their mediating effects through behavioral.

Our model suggests that perceived usefulness and subjective norms positively affect actual technology use and that perceived ease of use has a positive impact on perceived usefulness. According to our model, cognitive style has important direct effects on perceived usefulness, perceived ease of use, and subjective norms. In addition, computer self-efficacy has positive effects on both perceived usefulness and perceived ease of use but not on subjective norms.

In general, innovators are relatively non-conformists, prefer alternative approaches to problem solving and are fond of exploration. Therefore, innovators are more likely to appreciate the “utility” of a new technology than adaptors who, on the other hand, tend to be task-oriented and prefer
existing or familiar ways of doing things. Accordingly, we test the following hypothesis.

1. Cognitive style (Computer self-efficacy) has a significant effect on Actual technology use.
2. Cognitive style (Perceived usefulness) has a significant effect on Actual technology use.
3. Cognitive style (Perceived ease of use) has a significant effect on Actual technology use.
4. Cognitive style (Subjective norms) has a significant effect on Actual technology use.
5. There is statistically significant that Cognitive style effect on actual technology use due to personal trend

3. Research Design and Data Collection Methodology

The first phase of the research thesis proposal included identifying and defining the problems and establishment objective of the study and development research plan.

The second phase of the research included a summary of the comprehensive literature review. Literatures on claim management were reviewed.

The third phase of the research included a field survey which was conducted with the examining the effects of cognitive style in individuals' technology use decision making "Case study on UNRWA's newly appointed secretaries in education field"

The fourth phase of the research focused on the modification of the questionnaire design, through distributing the questionnaire to pilot study,
The purpose of the pilot study was to test and prove that the questionnaire questions are clear to be answered in a way that help to achieve the target of the study. The questionnaire was modified based on the results of the pilot study.

**The fifth phase** of the research focused on distributing questionnaire. This questionnaire was used to collect the required data in order to achieve the research objective.

**The sixth phase** of the research was data analysis and discussion. Statistical Package for the Social Sciences, (SPSS) was used to perform the required analysis. The final phase includes the conclusions and recommendations.

Two hundred questionnaires were distributed to the research population and 197 questionnaires are received

Figure (1) shows the methodology flowchart, which leads to achieve the research objective.
In order to collect the needed data for this research, we use the secondary resources in collecting data such as books, journals, statistics and web pages, in addition to preliminary resources that not available in secondary resources through distribute questionnaires on study population in order to get their opinions about the examining the effects of cognitive style in individuals' technology use decision making "Case study on UNRWA's newly appointed secretaries in education field". Research methodology
depends on the analysis of data on the use of descriptive analysis, which depends on the poll and use the main program (SPSS).

4. Analysis Results and Discussion

The study clarifies that Examining the Effects of in Individuals' Technology Use Decision Making which simply means that Cognitive Style (the perceived usefulness, the perceived ease of uses, the subjective norm, the computer self-efficacy) affect in Individuals' decision making in Use Technology

1- sample K-S Test will be used to identify if the data follow normal distribution or not, this test is considered necessary in case testing hypotheses as most parametric Test stipulate data to be normality distributed and this test used when the size of the sample are greater than 50. Results test as shown in table no.(1), clarifies that the calculated p-value is greater than the significant level which is equal 0.05 (p-value. > 0.05), this in turn denotes that data follows normal distribution, and so parametric Tests must be used.

Table (1) 1- sample K-S Test

<table>
<thead>
<tr>
<th>Number</th>
<th>Section</th>
<th>items No.</th>
<th>Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The effect of the perceived usefulness as one of cognitive styles on the actual technology use</td>
<td>28</td>
<td>0.856</td>
<td>0.456</td>
</tr>
<tr>
<td>2</td>
<td>The effect of the perceived ease of use as</td>
<td>9</td>
<td>0.744</td>
<td>0.638</td>
</tr>
<tr>
<td>Number</td>
<td>Section</td>
<td>items No.</td>
<td>Statistic</td>
<td>P-value</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>3</td>
<td>The effect of the subjective norm as one of cognitive styles on the actual technology use</td>
<td>13</td>
<td>0.666</td>
<td>0.767</td>
</tr>
<tr>
<td>4</td>
<td>The effect of the computer self-efficacy one of cognitive styles on the actual technology use</td>
<td>9</td>
<td>0.803</td>
<td>0.539</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>59</td>
<td>0.856</td>
<td>0.456</td>
</tr>
</tbody>
</table>

1. The perceived usefulness has affect in Individuals' decision making in Use Technology. The overall Proportional mean is 91.55%, The highest mean in the **perceived usefulness** field was “Characteristics of the existing network meets the work needs”. The Proportional mean for this sub function was 93.61%", The lowest Proportional mean was “Training courses are hold for the definition of computer systems and programs", the Proportional mean for this sub function was 89.33%, although it is the lowest in the field, it still high.

2. The perceived ease of use has affect in Individuals' decision making in Use Technology. The overall Proportional mean is 91.10%, The highest mean in The perceived ease of use field was “Ease of use of Microsoft Access enabled to accomplish tasks more quickly " , The Proportional mean for this sub function was 92.39%" , The lowest Proportional mean was “People who influence my behavior think that I should use MS ACCESS " , the Proportional mean for this sub function was 89.74%, although it is the lowest in the field, it still high.
3. The subjective norm has affect in Individuals' decision making in Use Technology. The overall Proportional mean is 93.98%, The highest mean in The subjective norm field was “Computer programs (MS ACCESS, Excel) is working on completing the repeated process" , The Proportional mean for this sub function was 95.43% , The lowest Proportional mean was “Computer programs (MS ACCESS, Excel) help in completing work on time " , the Proportional mean for this sub function was 91.98%, although it is the lowest in the field, it still high.

4. The computer self-efficacy has affect in Individuals' decision making in Use Technology. The overall Proportional mean is 92.39%, The highest mean in the computer self-efficacy field was “Using technology and computer programs (MS ACCESS, Excel) enables me to accomplish my tasks more quickly " , The Proportional mean for this sub function was 95.74% , The lowest Proportional mean was “I find MS ACCESS to be flexible to interact with " , the Proportional mean for this sub function was 90.46%, although it is the lowest in the field, it still high.

5. The overall Proportional mean is 92.15%, The highest mean in the fields was “The effect of the subjective norm as one of cognitive styles on the actual technology use " , The Proportional mean for this field was 93.98% , The highest mean in the fields was " The effect of the perceived ease of use as one of cognitive styles on the actual technology use" , The Proportional mean for this field was 91.10% , although it is the lowest in the fields, it still high.
6. The result of the effects of cognitive style in individuals' technology use decision making due to gender show that there is no difference due to gender.

7. There is no difference at significant level $\alpha = 0.05$ about the effects of cognitive style in individuals' technology use decision making due to the level of scientific qualification.

8. There is no statistically difference at significant level $\alpha = 0.05$ about the effects of cognitive style in individuals' technology use decision making due to the level of scientific qualification due to age.

9. There is statistically difference significant level $\alpha = 0.05$ about the examining the effects of cognitive style in individuals' technology use decision making due to the level of scientific qualification due to experience and show that the difference between "1 to 4 years", "More than 10 years", and the difference in favor of "1 to 4 years".

10. There is statistically difference at significant level $\alpha = 0.05$ about the effects of cognitive style in individuals' technology use decision making due to Graduation rate and show that the difference between "Excellent", "Good", and the difference in favor of "Excellent".

11. The result of the effects of cognitive style in individuals' technology use decision making due to The level of computer literacy and show that there is statistically significant level $\alpha = 0.05$ about the difference between "Limited knowledge", "High knowledge", and the difference in favor of "High knowledge".
Examining the Effect of Cognitive Style in Individuals' Technology Use Decision Making
University of Palestine  www.up.edu.ps

There is no statistically difference at significant level $\alpha = 0.05$

about the examining the effects of cognitive style in individuals' technology use decision making due to Number of training courses

5. Conclusion

In this research we discuss the relationship between cognitive style and technology acceptance and empirically test hypotheses it suggests. We anchor our analysis using the KAI cognitive theory (Kirtons 2003) and conduct a survey study to test the effect of cognitive style on the individual’s decision on whether to accept a new technology. We synthesize relevant previous research and propose a factor model that explains or predicts technology acceptance by targeted secretaries. Our model encompasses the effect of cognitive style and includes other important acceptance drivers, and is tested empirically using the evaluative responses to Microsoft ACCESSTM by 428 newly appointed secretaries in education field of UNRWA. An investigative locus of our study is comparing the responses by innovators and adapters. We find that cognitive style has a significant effect on the individual’s technology acceptance decision-making, and that innovators are more likely to accept a new technology than adaptors. Using the subjects’ responses, we test the model as a whole as well as the hypotheses it suggests. Based on our data analysis, we highlight our important findings and discuss their implications to user acceptance research as well as the practices for fostering use of information technology by newly appointed secretaries in education field of UNRWA.
6. References


