An Empirical Evidence on Accountants' Use
of Spreadsheets in Saudi Arabia

Mohammed H. Al-Moghaiwli
Assistant Professor, Accounting Department
College of Administrative Science, King Saud University
P.O. Box 2459, Riyadh 11451, Saudi Arabia

Abstract. This study aims at collecting empirical evidence on accountants' use of spreadsheets in Saudi Arabia. Awareness of the importance of spreadsheets to accountants emerged first in the technologically developed countries in the early 1980s, but increasingly has attracted a great deal of attention in many different countries over the last twenty years. Factors that affect users's attitudes in choosing among alternative spreadsheet applications are established through Davis's Technology Acceptance Model (TAM). Using this Model, the current study hypothesizes that: (1) the more a spreadsheet software is perceived to be useful for the job, the more it is used by Saudi accountants [*The Perceived Usefulness (PU) Hypothesis*], and (2) the more a spreadsheet software is perceived to be easy to use, the more it is used by Saudi accountants [*The Perceived Ease of Use (PEOU) Hypothesis*]. The descriptive findings indicate that: (1) about 97% of accountants used spreadsheets in Saudi Arabia; (2) Excel is the preferred spreadsheet application in the country; and (3) basic record-keeping, depreciation, operating budget and management reports are clearly the tasks most frequently undertaken with spreadsheets. The findings of the multivariate tests: (1) support *the Perceived Usefulness (PU) Hypothesis* and indicate that perceived usefulness (PU) variable is a determinant of spreadsheet use in Saudi Arabia, and (2) lend weak support to *the Perceived Ease of Use (PEOU) Hypothesis*. Although this study has limitations, it has a contribution to knowledge. Incorporating these results and related spreadsheet skills into accounting courses would make accounting teaching reflecting the needs of accounting practices and produce accounting graduates who possess a broad array of computer skills and knowledge. Managers of domestic organizations may also get benefit from the results in that they may stress a factor like usefulness of new spreadsheet software in user training programs. For example, comparing the value of Excel to manual systems in making the work of accountants easier and more productive should lead to better implementation of spreadsheets. This study is also of high interest to providers of technology. Over the past years many companies from developed countries have been globalizing their business. Providers of technology may therefore be interested in understanding how and why technology has or has not been used by less developed nations.

1. Introduction

In the last two decades the way business is conducted and office tasks are undertaken has

been revolutionized by spreadsheets[1]. Anderson, Sweeney and Williams [1, p.31] provide the following situations to describe some typical business applications of spreadsheets:

1) "A manufacturer wants to develop a production schedule and an inventory policy that will satisfy sales demand in future periods. Ideally, the schedule and policy will enable the company to satisfy demand and at the same time minimize the total production and inventory costs.

2) A financial analyst must select an investment portfolio from a variety of stock and bond investment alternatives. The analyst would like to establish the portfolio that maximize the return on investment.

3) A marketing manager wants to determine how best to allocate a fixed advertising budget among alternative advertising media such as radio, television, newspapers, and magazine. The manager would like to determine the media mix that maximizes advertising effectiveness.

4) A company has warehouses in a number of locations throughout the United States. For a set of customer demands, the company would like to determine how much each warehouse should ship to each customer so that total transportation costs are minimized."

The above examples, which are only a few of the situations in which spreadsheets have been successfully used, emphasize the fundamental importance of spreadsheets to all areas of business. However, many information technology (IT) researchers have recognized the existence of internationally widespread resistance to spreadsheets. This has been a motivating factor for extensive research in the technologically developed countries (see, for example, Chau [2]; Sutton and Faulkner [3]; Hendrickson, Massey, Cronan [4]; Baxter and Oatley [5]; Batson [6]). The current study examines accountants' use of spreadsheets in Saudi Arabia where, by comparison with the technologically developed countries, much less research has been undertaken. More specifically, this study seeks a better understanding of the mostly used spreadsheets applications and spreadsheet functions and tasks in practice and the factors contributing to the acceptance or rejection of a spreadsheet. It is hoped that this understanding might be the first step toward the solution of the spreadsheet resistance problem and might help accounting educators to prepare students to cope with technological changes in practice.

The plan of the rest of this paper is as follows:
The study motivations and objectives are   precisely outlined in section 2. Implications and limitations of the study are described in sections 3 and 4, respectively.

---

[1] Basically, a spreadsheet is software that transforms a computer into an electronic workbook-an array of rows and columns into which data can be fed. This electronic workbook can than calculate formulas instantly and automatically recalculate them when values change. The spreadsheet software can also be a wonderful tool for charting data of all kinds, what-if analysis, and long-term planning and forcasting in a financial environment.

Section 5 describes the theoretical and empirical foundations of the study. The study hypotheses are established in section 6. An outline of the study methodology and results is described in sections 7 and 8, respectively. Section 9 contains conclusions on the major findings of the study and section 10 provides areas for future research.

2. Motivations and Objectives

Acceptance and voluntary use of spreadsheets by accountants is deemed a necessary condition for their success in contemporary society. Examples of spreadsheet use by accountants may range from the development of operating budgets and management reports to payroll, Zakat, and taxes calculations. However, resistance to information technologies in general, and spreadsheets in particular is an internationally recognized problem. Evidence developed by, for example, Venkatesh and Morris [7], Agarwal and Prasad [8], Doll, Hendrickson, and Deng [9], Straub, Keil, and Brenner [10], Prescott and Conger [11], Davis [12], Torkzadeh and Angulo [13], indicates that most spreadsheet failures result from a lack of user acceptance rather than poor quality of the software applications. The current study examines the underlying reasons behind accountants' acceptance or rejection of spreadsheets. More specifically, the principal question to be investigated in this study is:

What are the factors that contribute to the acceptance of spreadsheets by Saudi accountants?

The accounting literature provides the view that the resistance to computers as well as software result from poor accounting teaching content and methods (see, for example, Collins [14]; Bhaskar [15]; Bhaskar [16]). In recent years accounting academicians in Saudi Arabia have become increasingly concerned that accounting education is failing to meet the needs of the profession since the focus of accounting courses continue to be on memorization of concepts and rules rather than on the technological changes in and needs of practice[2]. In order to help accounting educators in overcoming this problem, this study also addresses the following questions:

1. *What a spreadsheet does Saudi accountants use the most?*
2. *What spreadsheet functions do Saudi accountants use the most?*
3. *What spreadsheet tasks do Saudi accountants undertake the most?*

3. Implications

The results of this study have several implications:
1.   This study aims at collect evidence on factors contributing to accountants acceptance of spreadsheets in Saudi Arabia; thus it is of high interest to managers of domestic business organizations in that it can assist such organizations in stressing these

---

[2]The Saudi Accounting Association, Accountancy ([17], pp. 19-20) ([18], pp.38).

factors in employee training programs, which could lead to better implementation of spreadsheets;

2.   This study is also of high interest to providers of technology. Over the past years many companies from developed countries have been globalising their business. Providers of technology may therefore be interested in understanding how and why technology has or has not been used by less developed nations.

3.   This study also seeks a better understanding of the most frequently used spreadsheet packages, spreadsheet functions, and spreadsheet tasks in practice. This understanding would help accounting academicians in introducing spreadsheets and related studies into accounting courses and, hence, in making accounting teaching reflecting the needs of accounting practices.

4. Limitations

Limitations of this study would include the following:

1.   The study concentrates on one type of spreadsheet users; accountants. Therefore, the study's findings may not be generalized to other categories of end users;

2.   Since a survey questionnaire is used to gather the data for the analysis, there may be a possibility that the results contain some systematic errors leading from sampling and/or cultural biases; and

3.   Since a rigorous link between the theory and the empirical analysis has not been well established in the less technologically developed world, our empirical results may be limited by problems related to measurement errors and omitted variables.

5. Literature Review[3]

This section describes the theoretical and empirical foundations for the present study by reviewing IT diffusion and use literature. Over the last two decades research into IT diffusion and use has received a great deal of attention (Doll, Hendrickson, and Deng [9]; Prescott and Conger [11]; Thompson and Rose [19]). In general, this research

---

[3]It is worth emphasizing here that: (1) because the literature in this area is huge and growing at an exponential rate, it is not practical to attempt to review it all. We have selected a number of studies which seem most relevant to our own work; (2) all the major journals for the period 1990 to 2001 have been systematically reviewed in order to identify whether any recent findings or developments are relevant; (3) as is true with the IT literature generally, most of the studies reviewed in this section relate to the technologically developed countries; nevertheless, some studies conducted in other countries have been found useful and hence incorporated into our review; and (4) given the different socio/economic environment in which Saudi employees work, the results of the studies reviewed in this section need to be cautiously interpreted in the context of the Saudi Arabia environment.

can be chronologically classified into two broad categories; End-User Computing (EUC) research, and IT acceptance research.

5.1 End-user computing (EUC) research

Study of EUC had been very popular during the 1980s. Benjamin [20] was the first to establish the practice of calling "end-user computing (EUC)" when he attempted to classify the characteristics of the applications which exist at that time. Rockart and Flannery ([21], p.779) defined EUC as "the ability of the ultimate users to fulfil their computational needs". Carr ([22], p.15) defined EUC as "the direct hands-on use of computers by people with problems for which computer-based solutions are appropriate". Carr argues that EUC was born and evolved in the management information systems (MIS) environment in response to several reasons; among them is the vastly increased use of personal computers (PC) by organizations throughout the Western developed countries.

The PCs first became widely perceived as a business tool with the advent of the VisiCalc electronic spreadsheet in the late 1970s. VisiCalc was king in the spreadsheet world during that time until it was eclipsed by three products: Microsoft Excel, Lotus 1-2-3, and Corel's Quattro Pro. (Branzburg, [23]).

The wide proliferation of spreadsheet use as an EUC tool by managers and professionals has long been documented. To give but a few examples on this: decision analysis (Jones, [24]); optimization (Roy, Lasdon, and Plane, [25]); manpower planning (Anthony & Wilson, [26]); forecasting (Mumford, Schultz, and Troutt, [27]); costing (Wellman, [28]); and stochastic simulation (Przasnyski, [29]).

The wide proliferation of spreadsheet use by accountants has in particular received a special attention (Carr [30]; Mason and Willcocks [31]; Coy, Nelson, Buchanan, and Fisher [32]). In a typical study, Carr showed that spreadsheet packages were used by about three-quarters of all UK accountants, more than any other type of computer software. In a more recent study, Coy, Nelson, Buchanan, and Fisher ([32], p.70) extended their 1996 study of spreadsheet use by accountants in New Zealand to Australia and Canada, and abstracted the following quotation:

> The study found a high level of spreadsheet diffusion in all three countries, with Canada a little ahead of Australia and New Zealand on some evidence. About 80% of accountants use spreadsheets in Canada and Australia, and 75% in New Zealand. Excel is the preferred spreadsheet brand in each country, although Lotus is a stronger 2nd in Canada than in the other two countries. Saving time on calculations and being more confident about accuracy of work were the most important benefits of spreadsheets identified respondents.

In less technologically developed countries IT diffusion and use is impeded by such insurmountable barriers as a lack of national infrastructure (Mahmood, Gemoets, and Gosler [33]; Odedra, Lawrie, Bennett, and Goodman [34]), or government policies set in place to prevent technology transfer (Goodman and Green [35]; Bukhari and Meadows [36]).

5.2 IT Acceptance research

Most IT system failures result from a lack of user acceptance rather than poor quality (Davis [12]; Torkzadeh and Angulo [13]). As a result, the area of user acceptance of IT has received a great deal of attention and includes a wealth of research. A literature review by Prescott and Conger [11] and Thompson and Rose [19], for instance, reveals that a substantial amount of IT diffusion and use research has been motivated by the desire to predict the factors which lead to the user acceptance of an information technology system.

Viewing IT acceptance and usage as a user behavior enabled IT researchers to utilize some social psychological models in order to predict the determinants which lead to IT use. A well researched social psychological model is Rogers [37]'s Diffusion of Innovations Model (DOIM), which hypothesizes that the intention to perform a behavior is influenced by personal evaluations about the effects of performing the target behavior.

In recent years, IT researchers widely use Davis [38]'s Technology Acceptance Model (TAM) in order to gain a better understanding of the use of information technologies (Venkatesh and Morris [7]; Agarwal, and Prasad [8]; Doll, Hendrickson, and Deng [9]; and Straub, Keil, and Brenner [10]). Davis's TAM is basically based on the Theory of Reasoned Action (TRA), which postulates that a person's actual behavior is determined by his behavioral intention which is jointly determined by the person's attitude and subjective norms concerning the behavior in question (Fishbein and Ajzen, [39]). In Davis's TAM, three constructs were identified: beliefs; attitude towards use; and behavioral intention. Davis asserted that perceived ease of use (PEOU) and perceived usefulness (PU) represent the beliefs that influence attitudes which in turn lead to intention, and therefore generate usage behaviors. Perceived usefulness (PU) refers to "the degree to which a person believes that using a particular system would enhance his or her performance", while perceived ease of use (PEOU) is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, [40], p.320).

Unlike Rogers's DOIM, Davis's TAM has proven to be applicable across a wide variety of IT applications and across cultures of varying technological development levels (see, for example, Rose and Straub [41]; Straub, Keil, and Brenner [10]; Goette [42]; Straub [43]; Hendrickson, Massey, and Cronan [4]; Adams, Nelson, and Todd [44]; Mathieson [45]; Davis [40]; Davis [38]).

Straub, Keil, and Brenner [10] compared Davis's TAM across three technologically developed countries: Japan; Switzerland, and North America. The data for the study were gathered by means of a comprehensive questionnaire, which was completed by employees of 3 different airlines, all of whom had access to the e-mail as an information technology innovation. The results indicate that Davis's TAM holds for Switzerland and North America, but not for Japan.

Three studies have also investigated Davis's TAM using the spreadsheets as the application; Mathieson [45]; Adams, Nelson, and Todd [44]; Hendrickson and Collins [46]. Using different methodologies, these studies have found that perceived usefulness (PU) and perceived ease of use (PEOU) correlate well with spreadsheets usage (U).

Davis's TAM has also been tested outside the technologically developed countries. Rose and Straub [41], for instance, tested Davis's TAM across five Arab countries: Jordan, Egypt, Saudi Arabia, Lebanon, and the Sudan. The study was conducted by administering Davis's perceived ease of use (PEOU) and perceived usefulness (PU) instruments to 274 managers and professionals in the public and health sectors in these five countries. The sample base was composed of 121 from Jordan, 45 from Egypt, 28 from Saudi Arabia, 35 from Lebanon, and 45 from the Sudan. Using the Partial Least Squares (PLS) statistical technique, Rose and Straub found that Davis's TAM instruments holds for the Arab world. Gomaa and Al-Rwita [47] also supported this view and showed, using 71 Saudi and non-Saudi accountants and auditors, the ability of TAM in explaining the computer usage behavior by the cultural characteristics of individuals.

6. Resrach Hypotheses

Seeking an answer to the research principal question ought properly to begin with identifying whether, or not, explanations for the acceptance of spreadsheets originating in the technologically developed world would also apply in Saudi Arabia. This suggests the use of a model that has been well researched in the developed world and has shown robustness across technologies as well as across cultures around the world. For these reasons, Davis [38]'s TAM is selected as an appropriate model for studying the acceptance pf spreadsheets by Saudi accountants.

As originally articulated, Davis's TAM posits that beliefs influence attitudes which lead to intentions, and hence generate IT usage behaviors. More specifically, the model contains three constructs. The first is beliefs which are represented by perceived usefulness (PU) and perceived ease of use (PEOU)[4]. The other two constructs are attitude towards use and behavioral intention to use. Attitude towards use is the user's

---

[4]Perceived ease of use (PEOU) refers to the degree to which a person expects the target information system to be free of effort, while perceived usefulness (PU) is defined as the degree to which the prospective user believes that using a particular information system would enhance his/her performance.

evaluation of the desirability of employing a particular information technology, while behavioral intention to use is a measure of the likelihood a person will employ a particular information technology (Fishbein and Ajzen, [48]).

Because of the weak effects of attitude towards use and behavioral intention to use constructs, some researchers have ignored these two constructs, and instead examined the effect of perceived usefulness (PU) and perceived ease of use (PEOU) directly on usage (see, for example, Teo, Lim, and Lai [49]; Gefen and Straub [50]; Igbara, Guimaraes, and Davis [51]; Adames, Nelson, and Todd [44]). We follow this line of work and study the direct effect of perceived usefulness (PU) and perceived ease of use (PEOU) on usage. Figure (1) shows the TAM model in the current study.
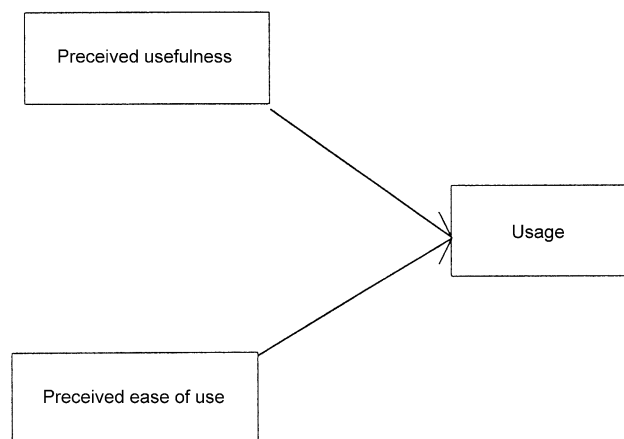

Fig. 1. TAM and spreadsheets usage.

This model motivates us to posit that the following hypotheses are expected to be true in the context of Saudi Arabia:

Hypothesis 1: The more spreadsheet software is perceived to be useful, the more it will be used by accountants.

Hypothesis 2: The more spreadsheet software is perceived to be easy to use, the more it will be used by accountants.

7. Methodology

7.1 Instrument development

The author has developed a survey instrument that contained instructions asking the respondents to identify a spreadsheet and spreadsheet functions and tasks he/she uses often and then to answer questions about the extent to which a spreadsheet meets perceived usefulness (PU) and perceived ease of use (PEOU) characteristics. Using a survey methodology follows researchers' recommendation (see, for example, Teo, Lim,

and Lai [49], and Lederer, Maupin, Sena, and Zhuang [52]) to collect data from a large number of individuals and for quantifying relationships between variables.

The survey had the following major sections:

- Eight demographic questions. Eight questions were about the respondent's age, gender, education level, organization type, computer experience, spreadsheet system at work, spreadsheet experience, and spreadsheet software used for work.

- Nine functions and ten tasks. The respondents were asked to indicate what common spreadsheet functions they used and what tasks they undertook with spreadsheets. Ratings on a 1-3 scale with end points of "often" and "never" enabled the respondents to specify the frequency of use.

- Six items asking the respondents to specify the extent to which the spreadsheet software meets perceived usefulness (PU) characteristics. Ratings on a 1-5 scale with end points of "strongly agree" and "strongly disagree" enabled the respondent to indicate the extent. Table 1 lists these six items which were drawn from Davis [40][5].

Table 1. Description of perceived usefulness items

Perceived Usefulness (PU)
1. Using the spreadsheet software in my job would enable me to accomplish tasks more quickly.
2. Using the spreadsheet software would improve my job performance.
3. Using the spreadsheet software in my job would increase my productivity.
4. Using the spreadsheet software would enhance my effectiveness on the job.
5. Using the spreadsheet software would make it easier to do my job.
6. I would find the spreadsheet software useful in my job.

- Seven items asking the respondents to specify the extent to which the spreadsheet software meets perceived ease of use (PEOU) characteristics. These items also used the same 1-5 scale. Four items were general measures drawn from Davis [40][6], see Table 2A. Three were environmental-oriented items reflecting culture differences and difficulties associated with understanding the English language, see Table 2B. These three items were supported by the view that the level of any computer software usage in Saudi Arabia would be highly affected by understanding the English language and culture differences (e.g. difficulties associated with installing Arabic fonts/printing direction; Islamic dates; default to US$ etc.)

---

[5]These items are widely regarded and have received considerable attention by researchers (see, for example, Lederer, Maupin, Sena, and Zhuang [52]; Teo, Lim, and Lai [49]; Subramanian [53]; and Segars and Grover [54]). Additionally, in their analysis of the validity and reliability of Davis' items, Doll, Hendrickson, Deng ([9], p. 839) wrote: "the results of this confirmatory study provide strong support for the validity and reliability of Davis's six-item perceived usefulness and six-item ease-of-use instruments".

[6]Ibid,.

Table 2. Description of perceived ease of use items

(A) Perceived ease of use (PEOU)

1. Learning to operate the spreadsheet software would be easy for me.

2. I would find it easy to get the spreadsheet software to do what I want it to do.

3. It would be easy for me to become skilful at using the spreadsheet software

4. I would find the spreadsheet software easy to use.

(B) Perceived ease of use (PEOU)

1.It would be easy for me to understand the terms of the spreadsheet software.

2.It would be easy for me to understand the notes of the spreadsheet software

3. It would be easy for me to understand the graphics of the spreadsheet software

- Two items[7] measuring spreadsheet software usage. One asked the respondent how frequently he/she used the spreadsheet software in the past 30 days. Frequency of uses was measured on a six-point scale ranging from "less than once a month" to "several times a day". The second item asked the respondent how many times per work day she/he uses the spreadsheet software. The amount of time spent on spreadsheets was also measured on a six-point scale ranging from "almost never" to "more than 3 hours per day".

7.2 Subjects

　　The current study had surveyed Saudi accountants working in three different types of organizations: banks, CPA firms, and private and public companies. The method of accessing subjects during the data collection process is of vital importance due to the bias effects which might be inherited in the research results. Access to subjects can be achieved in four different ways: in face-to-face interviews; by telephone; by mail; or by e-mail. The self-administrated questionnaire was selected for the present study. The method of access to the subjects was as follows: a top manager of each organization has contacted its Saudi accountants to gain commitment for surveys; then, he/she distributed and administered the questionnaire version to a group of respondents gathering at the same time and at the same place. The logic behind this specific selection is that it would decrease the number of "don't know" and "no answers", and hence producing higher completion rate and more relevant responses (Babbie, 1973). 327 surveys were completed with a %66 (327/500) response rate. The sample base was composed of 45 from banks; 168 from CPA firms; and 114 from companies.

8. Results

8.1 Demographics and Descriptive Statistics

　　Table 3 gives means and standard deviations for respondents' age, years of computer usage, years of spreadsheets usage, years of spreadsheets use for job. Respondents had an

---

[7]These two items have been adopted by several studies (e.g. Lederer, Maupin, Sena, and Zhuang [52]; Teo, Lim, and Lai [49]; Rose and Straub [41]; Straub, Keil, and Brenner [10]; Hendrickson and Collins [46]; Subramanian [53]; and Segars and Grover [54]).

average age of 29.7. Table (3) also shows that respondents had used the computer for an average of 4 years and had used spreadsheets for an average of over 3 years.

Table 3. Descriptive statistics

Item	Mean (μ)	S.D. (σ)
Age	29.7	2.5
Years of computer usage	4.0	0.92
Years of spreadsheets usage	3.2	0.85
Years of spreadsheet use for job	2.9	0.69

Table 4 contains demographic information including: gender, education level, and usage of spreadsheet packages. The results indicate that 89% of respondents were males and above 50% of the respondents were college graduates with about 3% holding an advanced degree, and another 17% having a professional accounting certificate. Table 4 also shows that Microsoft Excel is the clear first-favored brand, and Lotus 123 comes next.

Table 4. Demographic information

Gender	No. of respondents	% of respondents
Male	291	89
Female	36	11
Total	**327**	**100**
Education level	**No. of respondents**	**% of respondents**
High school graduate	39	12
College graduate	175	54
CPA, etc.	54	17
Masters	5	2
Doctorate	3	1
Other	51	16
Total	**327**	**100**
Spreadsheet application	**No. of respondents**	**% of respondents**
Excel	242	74
Lotus 123	46	14
Quattro Pro	29	9
Supercalc	0	0
Symphony	0	0
Other	10	3
Total	**327**	**100**

Tables 5 and 6 shows the results of the most frequently used spreadsheet functions and tasks, respectively. From Table 5, it is clear that the edit, algebraic, graphic and database commands were being the most frequently used. Table 6 shows that the basic record-keeping and depreciation were the task most frequently undertaken with spreadsheets, followed by operating budget and management reports.

Table 5. Proportion of accountants using specific function

Spreadsheet functions	%
Edit commands (e.g. copy and past)	2.79
Graphics	2.46
Database commands	2.52
IF commands	1.47
Algebraic commands	2.71
Operations research commands	1.13
Macros	1.22
Data commands (e.g. import and export data)	1.69
Merging spreadsheet files	1.27

Table 6. Proportion of accountants using specific tasks

Spreadsheet tasks	%
Basic record-keeping	2.54
Payroll calculations	1.48
Zakat and Taxes calculations	1.62
Depreciation schedules	2.11
Financial accounts	1.61
Variance analysis	1.09
CVP Analysis	1.19
Operating budget	2.06
Capital budget	1.44
Management reports	2.02

8.2 Summary statistics of variables

Following IT literature (e.g. Lederer, Maupin, Sena, and Zhuang [52]; Teo, Lim, and Lai [49]; Rose and Straub [41]; Straub, Keil, and Brenner [10]), respondents were asked to indicate how frequent they had been using a spreadsheet in the past 30 days and how much time (in an average work day) they spent working on a spreadsheet in the past 30 days. The results are summarized in Tables 7 and 8.

The results show that about 44% of respondents indicated that they used a spreadsheet for several times a day, and about 14% of respondents reported that they spent (in an average work day) more than 3 hours. The results also indicate that about 3% of respondents reported that they did not use a spreadsheet in the past 30 days.

Table 7. Proportion of spreadsheets usage frequency

Spreadsheets usage frequency	% Respondent
Several times a day	44
About once a day	37
A few times a week	8
A few times a month	6
Once a month	3
Less than once a month	3

Table 8. Proportion of spreadsheets usage time

Spreadsheets usage time	% Respondent
More than 3 hours	14
From 2-3 hours	17
From 1-2 hours	32
From ½-1 hour	26
Less than ½ hour	9
Almost never	3

Most respondents agreed that using a spreadsheet had been beneficial from different viewpoints:

96% of respondents agreed that using a spreadsheet enabled them to accomplish tasks more quickly.

94% of respondents agreed that using a spreadsheet improved their job performance.

93% of respondents agreed that using a spreadsheet increased their productivity.

93% of respondents agreed that using a spreadsheet enhanced their effectiveness on their job

96% of respondents agreed that using a spreadsheet made it easier to do their job.

95% of respondents rated using a spreadsheet, in overall, to be advantageous.

Findings regarding ease of use of a spreadsheet reflect the following viewpoints:

84% of respondents agreed that learning to operate a spreadsheet was easy for them.

83% of respondents agreed that it was easy to get a spreadsheet to do what they want it to do.

79% of respondents agreed that it was easy for them to become skilful at using a spreadsheet.

78% of respondents agreed that it was easy for them to understand the spreadsheet terms.

75% of respondents agreed that that it was easy for them to understand the spreadsheet notes.

75% of respondents agreed that it was easy for them to understand the spreadsheet graphics.

80% of respondents rated a spreadsheet, in overall, to be easy to use.

8.3 Data analysis

Measurement of IT research constructs is not a straightforward process. In theory, social science researchers attempt to explain and predict real-world phenomena via expressed relationships between research constructs. These constructs cannot be directly observed, but surrogates for them can be developed. Given this, there is often a possibility that these surrogates are not relevant measures of the unobservable constructs of the phenomena under investigation.

Another problem is that instrumentation that a researcher develops to translate IT constructs (for instance, perceived ease of use) into data may be significantly affected by the method of data collection (as in interviews versus mail questionnaire) and components of the selected method (as in item selection and item phrasing) (Ives, Olson and Baroudi [55]).

These problems usually makes data measurements to be inaccurately reflecting the unobservable research constructs. More specifically, these problems leads to biases which would carry over into invalid results. Tests of instrument validity have therefore been developed to examine the extent to which these problems affect findings. In the IT literature, these tests include: (1) pre-testing content; (2) construct validity; and (3) reliability (Prescott and Conger [11]); Thompson and Rose [19]).

In order to have content-valid items, the survey content was pre-tested by seven professionals who are familiar with the content universe and have long been using spreadsheets applications. The author has observed two of the pilot subjects as they completed the survey. Feedback from the seven pilot subjects has led to a form of consensus; minor changes to the wording of some items were done .

To test construct validity, the well-known principal components factor analysis of the perceived usefulness and ease of use items was performed. Table 9 shows that the items of the perceived usefulness (PU) variable all load on a single factor, and the items of the perceived ease of use (PEOU) variable all load on the second factor. Also, all loadings of the two factors passed the 0.40 rule-of-thumb test, indicating good construct validity (Rose and Straub [41]; Campbell and Fiske [56]).

Table 9. Factor analysis of the study variables

Items	Factor 1 loadings	Factor 2 loadings
Using the spreadsheet software in my job enables me to accomplish tasks more quickly	0.87	
Using the spreadsheet software improves my job performance	0.83	
Using the spreadsheet software in my job increases my productivity	0.62	
Using the spreadsheet software enhances my effectiveness on the job	0.64	
Using the spreadsheet software makes it easier to do my job	0.67	
I find the spreadsheet software useful in my job	0.72	
Learning to operate the spreadsheet software is easy for me.		0.72
I find it easy to get the spreadsheet software to do what I want it to do		0.77
It is easy for me to become skilful at using the spreadsheet software		0.62
I find it easy to understand the spreadsheet terms		0.42
I find it easy to understand the spreadsheet notes		0.59
I find it easy to understand the spreadsheet graphics		0.58
I find the spreadsheet software easy to use		0.61

The test of reliability is essentially an examination of measurement accuracy. They allow researchers to determine the extent to which the item score given by a respondent is a function of his/her misunderstanding rather than a reflection of his/her true opinion about the event. In the current study, reliability of the variables perceived usefulness (PU), perceived ease of use (PEOU), and spreadsheet usage (U) was assessed through Cronbach alpha technique. Table 10 presents Cronbach alphas of the research variables. All the values of Cronbach's á were above the 0.60 rule-of-thumb standard for exploratory research proposed by Nunnally [57], suggesting that the variables were reliable.

Table 10. Reliability analysis

Instruments	Cronbach's α
Perceived usefulness (PU)	0.72
Perceived ease of use (PEOU)	0.69
Usage (U)	0.81

Having established the validity of the research variables, the next step involved running multivariate regressions to determine how well the variables perceived usefulness (PU) and perceived ease of use (PEOU) explain usage (U) behavior of spreadsheets. The multivariate regression model used might be written, in the general form, as follows:

$$Y_i = \sum_{k=1}^{K} \beta_k X_{ik} + \varepsilon_i$$

where Y is the dependent variable spreadsheet usage (U), X_k for $k = 2$ are the independent variables PU and PEOU, ε is the disturbance term, β_k are unknown parameters, and the subscript i refers to the ith observation from the sample of size N.

This model firstly requires that *the overall scale* for each variable (PU, PEOU, and U) is calculated. Given that each variable is measured by a set of questions (items) and each respondent provides a score for each question, these scores are added together to form *an overall score* for each variable. The *overall scale* for each variable is simply the mean of this overall score.

Using the overall scales for each variable and for each respondent, the unknown parameters, β_k, of the multivariate regression model were then estimated using the Ordinary Least Squares (OLS) technique.

Two linear regressions were run. The first uses spreadsheet usage (U) measured by the number of frequencies used in the past 30 days as the dependent variable and perceived usefulness (PU) and perceived ease of use (PEOU) as the independent variables. The overall results of this regression are shown in Table 11.

Table 11. Overall regression results (Model I)

Regression statistics	PU	PEOU
Coefficients	0.95	0.29
t-value	3.13	1.66
p-value	0.002	0.09
F	30.86	
p < values	0.00	
R^2	0.16	

The regression statistics presented in the Table show that the first regression model is statistically significant with *F* of 30.86, implying that the null hypothesis of no statistical relation between the dependent and independent variables is rejected at the 0.001 level. Furthermore, the regression statistics indicate that the model explains approximately 16 percent of the variance in the usage behavior. Table (11) also provides a more detailed view of the coefficients estimated in the first regression. As indicated, the coefficients for the perceived usefulness (PU) and perceived ease of use (PEOU) variables are positive and their t-statistics are significant at the 0.002 and 0.09 levels, respectively. This suggests that perceived usefulness (PU) has a stronger effect on spreadsheet usage behavior than perceived ease of use (PEOU).

The second regression model uses spreadsheet usage (U) measured by the times of spreadsheet usage as the dependent variable and PU and PEOU as the independent variables. The overall results of this regression are reported in Table 12.

Table 12. Overall regression results (Model II)

Regression statistics	PU	PEOU
Coefficients	0.24	0.09
t-value	1.94	1.02
p-value	0.06	0.32
F	3.31	
p < values	0.05	
R^2	0.02	

The standard Goodness of fit test using the *F* test reveals the second model to be significant with *F* of 3.31, suggesting that the null hypothesis of no statistical effect of the perceived usefulness (PU) and perceived ease of use (PEOU) variables on spreadsheet usage behavior is rejected at the 0.05 level. The model II's explanatory power, which is measured by (R^2) is 0.02. The signs of all the coefficients reported in the Table are positive. The regression coefficient for perceived usefulness (PU) variable is significant at the 0.06 level. However, with usage measured by the times, the perceived ease of use (PEOU) variable has insignificant effect on spreadsheet usage behavior.

In summary, the findings of the multivariate tests: (1) support hypothesis 1 and indicate that perceived usefulness (PU) variable is a determinant of spreadsheet use in Saudi Arabia, and (2) lend weak support to hypothesis 2 that the more spreadsheets are perceived to be easy to use, the more it will be used by Saudi accountants.

9. Conclusions and Contributions

The conclusions we reach from the empirical analysis reported in this study can be summarized in terms of four basic points:

1. The descriptive statistics show that: (1) about 97% of accountants used spreadsheets in Saudi Arabia; (2) Excel is the preferred spreadsheet package in the country; (3) edit, algebraic, graphic and database are the commands most frequently used with spreadsheets; and (4) basic record-keeping and depreciation are clearly the tasks most frequently undertaken with spreadsheets, followed by operating budget and management reports. These results must be of major importance to accounting educators as well as practitioners. Incorporating these results and related spreadsheet skills into accounting courses would make accounting teaching reflecting the needs of accounting practices and produce accounting graduates who possess a broad array of computer skills and knowledge.

2. Consistent with a number of earlier IT studies (e.g. Lederer, Maupin, Sena, and Zhuang [52]; Teo, Lim, and Lai [49]; Rose and Straub [41]; and Straub, Keil, and Brenner [10]), our results support the hypothesis that a spreadsheet's perceived usefulness (PU) affects its use. Since the PU variable is a statistically significant determinant in the two regression models, this consistent basis makes it a powerful explanatory variable. However, the results of the multivariate tests of the PEOU hypothesis are less consistent than are tests of the PU hypothesis. This empirical evidence in favor of *the Perceived Usefulness (PU) Hypothesis* is of critical importance to domestic business organizations and providers of technology. For managers of domestic organizations, this evidence emphasizes the need for stressing a factor like usefulness of new spreadsheet software in user training programs. For example, comparing the value of Excel to manual systems in making the work of accountants easier and more productive should lead to better implementation of spreadsheets. For internationally technology providers, the results should aid them in the development of implementation and training strategies for Saudi spreadsheet users in general and accountants in particular.

3. The independent variables PU and PEOU affected the dependent variable spreadsheet usage behavior at the 0.16 level of explained variance, comparing unfavorably to prior TAM studies. For example, in the prior IT studies reviewed by Thompson and Rose [19] and Prescott and Conger [11], the explained variances were not less than 45%. In brief, the Model's weak explanation power ($R^2 = 16\%$) might reflect the existence of systematic measurement errors and/or omitted variables problems. For

example, following the IT literature we used two measures for the usage dependent variable: frequency of spreadsheet use; and the amount of time spent on spreadsheet use. Very infrequent or brief use of spreadsheets (e.g. for 30 minutes once per month) may reflect total uptake of the technology by a subject because that is the only part of her/his job which would best be done by a spreadsheet. Alternatively, using the spreadsheet for 4 hours once a day may only reflect half uptake by the subject. Now, if this is the case in the current study, then there might have measurement errors in the left-hand-side variable. Statistically, this would increase the probability of accepting the null hypothesis (i.e. increasing the probability of accepting a false hypothesis-a type II error).

4.   The Model's weak explanation power (R^2 =16%) might also reflect the existence of systematic measurement errors resulting from cultural and/or sampling biases. An example on cultural biases might be reflected in the independent variable perceived ease of use (PEOU). To mitigate the potential adverse effects of such problems, we developed three items to reflect culture issues (e.g. difficulties associated with installing Arabic fonts/printing direction; Islamic dates; default to US$ etc.), and then included them in the independent variable PEOU. Nevertheless, the PEOU variable was found a significant determinant of one out of two models and only at the 0.09 level. This suggests that cultural biases might be in play. It should, however, be noted here that the weak significant association of the PEOU variable is consistent with other studies (e.g. Lederer, Maupin, Sena, and Zhuang [52]; Straub, Keil, and Brenner [10]; Adams, Nelson, Todd [44]; and Davis [40]). Reasons for this insignificant association included that: (1) "PEOU exerts only an indirect effect on use" (Straub, Keil, and Brenner, [10], p.8), and/or (2) PEOU variable "is less important in explaining the level of post-adoption usage" (Davis, [40], p. 237).

10. Suggestions for Future Research

Even though this study provides several contributions to knowledge, many research opportunities and unresolved questions remain:

1.   Future research could use case-studies or lab experiments methodology to gain a clearer understanding of what tasks are most frequently undertaken with spreadsheets.

2.   The value of the Model's explanation power (R^2 =16%) might give indication that the PEOU independent variable might have systematic measurement errors leading from cultural biases. Therefore, future research could help in this by developing instrument which possibly reduces all culturally-dependent biases.

3.   Research to explore how spreadsheets and related skills can be incorporated into accounting courses is also a broad topic for future research.

References

[1]   Anderson, D., Sweeny, D. and Williams, T. *An Introduction to Management Science: Quantitative Approaches to Decision Making*. New York: South-Western College Publishing, 1999.

[2]   Chau, P. "An Empirical Assessment of a Modified Technology Acceptance Model." *Journal of Management Information Systems,* 13, No. 2 (1996), 185-204.

[3]   Sutton, D. and Faulkner, L. "The Use of Spreadsheets in Management Decision Making: A Linear Programming Case Study." *Leicester Business School Occasional Paper*,19 (1994).

[4]   Hendrickson, A., Massey, P. and Cronan, T. "On the Test-Retest Reliability of Perceived Usefulness and Perceived Ease of Use Scales." *MIS Quarterly* 17, No. 2 (1993), 227-230.

[5]   Baxter, I. and Oatley, K. "Measuring the Learnability of Spreadsheets in Inexperienced Users and Those with Previous Spreadsheet Experience." *Behaviour & Information Technology,* 10 (1991), 475-490.

[6]   Batson, J. "Spreadsheet Good Practice." *Accountants Digest*, Winter, (1986),1-30.

[7]   Venkatesh, V. and Morris, M. "Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior." *MIS Quarterly* 24, No. 1 (2000), 115-139.

[8]   Agarwal, R. and Prasad, J. "Are Individual Differences Germane to the Acceptance of New Information Technologies?" *Decision Science* 30, No. 2 (1999), 361-391.

[9]   Doll, W., Hendrickson, A. and Deng, X. "Using Davis's Perceived Usefulness and Ease-of-use Instruments for Decision Making: A Confirmatory and Multigruop Invariance Analysis." *Decision Science,* 29, No. 4 (1998), 839-869.

[10]   Straub, D., Keil, M. and Brenner, W. "Testing the Technology Acceptance Model Across Cultures: A Three Country Study." *Information and Management,* 33 (1997), 1-11.

[11]   Prescott, M. and Conger, S. "Diffusion of Innovation Theory: Borrowing, Extensions and Modifications from IT Researchers." *DATABASE for Advances in Information Systems*,26, Nos. 2&3 (1995), 20-41.

[12]   Davis, F. "User Acceptance of Information Technology: System Characteristics, User Perceptions and Behavioral Impacts." *Int. Journal of Man-Machine Studies,* 38 (1993), 475-87.

[13]   Torkzadeh, G. and Angulo, I. "The Concepts and Correlates of Computer Anxiety." *Behavior & Information Technology,* 11 (1992), 99-108.

[14]   Collins, R. "Computers and Accountancy Courses: A Comment." *Accounting and Business Research, 13*, No. 52 (1983), 313-315.

[15]   Bhasker, K. "Computers and the Choice of Accountancy Syllabuses." *Accounting and Business Research, 13*, No. 50 (1983), 83-90.

[16]   Bhasker, K.. "Use Computers in Accountancy Courses." *Accounting and Business Research, 13*, No. 49 (1982), 3-9.

[17]   The Saudi Accounting Association. *Accountancy*, No. 5 (1995), 19-20.

[18]   The Saudi Accounting Association. *Accountancy*, No. 19 (1998), 38.

[19]   Thompson, R. and Rose, G. "Information Technology Adoption and Use." *Proceedings of Administrative Sciences Association of Canada (ASAC) Annual Conference*, (1994), 16-26.

[20]   Benjamin, R. "Information Technology in the 1990s: A Long Range Planning Scenario." *MIS Quarterly,* 6 (1982), 11-31.

[21]   Rockart, J. and Flannery, L. "The Management of End User Computing." *Communications of the ACM,* 26 (1983), 776-784.

[22]   Carr, H. *Managing End-User Computing*, New Jersey: Prentice-Hall, Englewood Cliffs, 1988.

[23]   Branzburg, J. "In-Service: Spreadsheets." *Technology & Learning,* 21, No. 3 (2000), 67-68.

[24]   Jones, J. "Decision Analysis Using Spreadsheets." *European Journal of Operational Research,* 26 (1986), 386-400.

[25]   Roy, A., Lasdon, L. and Plane, D. "End-user Optimization with Spreadsheet Models." *European Journal of Operational Research,* 39 (1989), 131-137.

[26]   Anthony, S. and Wilson, J. "Manpower Modelling Using A Spreadsheet." *OMEGA International Journal of Management Science,* 18 (1990), 505-510.

[27]   Mumford, L., Schultz, D. and Troutt, M. "Using Spreadsheet Simulation to Generate a Distribution of Forecasts for Electric Power Demand." *Journal of Operational Research Society,* 42 (1991), 931-939.

[28]   Wellman, F. "Software Cost Estimating-Models and Methods." *OR Insight,* 5 (1992), 21-24.

[29] Przasnyski, Z. "Spreadsheets Simulation Model for Inventory Management." *SIMULATION,* 64 (1994), 32-43.

[30] Carr, J. *Information Technology and the Accountant*. Gower: CACA and DTI Study, 1985.

[31] Mason, D. and Willcocks, L. "Managers, Spreadsheets and Computing Growth: Contagion or Control?" *Journal of Information Systems,* 1 (1991), 115-128.

[32] Coy, D., M. Nelson, J. Buchanan and J. Fisher. "Spreadsheet Use: An International Comparison." *Chartered Accountants Journal*, (1998), 70-74.

[33] Mahmood, M., Gemoets, L. Gosler, M. "Information Technology Transfer and Diffusion to Mexico: A Preliminary Analysis." *Journal of Global Information Management,* 3 (1995), 5-15.

[34] Odedra, M., Lawrie, M, Bennett, M. and Goodman, S. "Sub-Saharan Africa: A Technological Desert." *Communications of the ACM,* 36 (1993), 25-29.

[35] Goodman, S. and Green, J. "Computing in the Middle East." *Communications of the ACM,* 35, No. 8 (1992), 21-25.

[36] Bukhari, A. and Meadows, A. "The Use of Information Technology by Scientists in British and Saudi Arabia Universities: A Comparative Study." *Journal of Information Science Principles & Practice,* 18, No.5 (1992), 409-415.

[37] Rogers, E. *Diffusion of Innovations*, New York: The Free Press, 1983.

[38] Davis, F. *A Technology Acceptance Model for Empirically Testing New End-user Information Systems: Theory and Results*, Unpublished Ph.D. Thesis, Massachusetts Institute of Technology, 1986.

[39] Fishbein, M. and Ajzen, I. *Beliefs, Attitude, Intention and Behavior: An Introduction to Theory and Research.* MA: Addison-Welsley, 1975.

[40] Davis, F. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." *MIS Quarterly,* 13 (1989), 319-339.

[41] Rose, G. and Straub, D. "Predicting General IT Use: Applying TAM to the Arabic World." *Journal of Global Information Management,* 6, No. 3 (1998), 39-45.

[42] Goette, T. *Determining Factors in the Successful Use of Adaptive Technology by Individuals with Disabilities: A Field Study.* Unpublished Dissertation, Georgia State University, 1995.

[43] Straub, D. "The Effect of Culture on IT Diffusion: E-mail and Fax in Japan and the U.S." *Information Systems Research,* 5, No. 1 (1994), 23-47.

[44] Adams, D., Nelson, R. and Todd, P. "Perceived Usefulness, Ease of Use and Usage of Information Technology: A Replication." *MIS Quarterly,* 16, No.2 (1992), 227-247.

[45] Mathieson, K. "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior." *Information Systems Research,* 2, No. 3 (1991), 173-191.

[46] Hendrickson, A. and Collins, M. "An Assessment of Structure and Causation of IS Usage." *The DATA BASE for Advances in Information Systems* 27, No. 2 (1996), 61-67.

[47] جمعة، إسماعيل إبراهيم و الرويتع، سعد صالح. "أثر اختلاف الثقافات على تقبل واستخدام الحاسبات في مكاتب المحاسبة والمراجعة في المملكة العربية السعودية ، *الندوة الثامنة لسبل تطوير المحاسبة في المملكة العربية السعودية ، جامعة الملك سعود،كلية العلوم الإدارية،*   "بالمملكة العربية السعودية محرم(١٤٢٠ه)، 322-347

[48] Ajzen, I. And Fishbein, M. *Understanding Attitudes and Predicting Social Behavior*. New Jersey: Prentice-Hall, Englewood Cliffs, 1980.

[49] Teo, T., Lim, V. and Lai, R. "Intrinsic and Extrinsic Motivation in Internet Usage." *Omega,* 27 (1999), 25-37.

[50] Gefen, D. and Straub, D. "Gender Differences in the Perception and Use of E-mail: An Extension to the Technology Acceptance Model." *MIS Quarterly,* 21, No. 4 (1997), 389-400.

[51] Igbaria, M., Guimaraes, T. and Davis, G. "Testing the Determinants of Microcomputer Usage Via a Structural Equation Model." *Journal of Management Information Systems,* 11, No. 4 (1995), 87-114.

[52] Lederer, A., Maupin, D. Sena, M. Zhuang, Y. "The Technology Acceptance Model and the World Wide Web." *Decision Support Systems,* 29 (2000), 269-282.

[53] Subramanian, G. "A Replication of Perceived Usefulness and Perceived Ease-of-Use Measurement." *Decision Sciences,* 25, No. 5/6 (1994), 863-874.

[54] Segars, A. and Grover, V. "Re-examining Perceived Ease-of-use and Usefulness: A Confirmatory Factor Analysis." *MIS Quarterly,* 17, No. 4 (1993), 517-525.

[55] Ives, B., Olson, M. and Baroudi, J. "The Measurement of User Information Satisfaction." *Communications of the ACM , 26* (1983), 785-793.

[56] Campbell, D. and D. Fiske. "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix", *Psychological Bulletin* 56, No. 2, (1959), 81-105.

[57] Nunnally, J. *Psychometric Theory*. New York: MaGraw-Hill, 1967.

Appendix (A)

Questionnaire

General instructions
1. This questionnaire is targeted at those official employees who are attending spreadsheets training courses.
2. your opinions are sought to several matters related to spreadsheets.
3. Please select the response that best indicates how you feel about each statement of the following questionnaire.
4. Please do not linger with a particular statement, as your initial impression is required.
5. Please answer all questions-please do not omit any.
6. Please write just one answer (circle) for each question.

Examples
Please circle the most appropriate position of each statement which corresponds most closely to your desired response.

If you think that it is quite likely that "**The weather in Riyadh is cold in March**" your answer to this statement would be as follows according to the different key given:

Key 1:	**The weather in Riyadh is cold in March**				
	1	2	3	4	5
	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
Key 2:	**The weather in Riyadh is wold in March**				
	1	2	3	4	5
	Almost never	Some of the time	About half of the time	Most of the time	Almost always

Part One

Please fill in/tick (as applicable) the box which corresponds most closely to your desired response.

How old are you?	☐ Year	☐ Months
What is your gender?	☐ Male	☐ Female

What is your education level?

☐ Holder of professional accounting certificate

☐ High school graduate

☐ College graduate

☐ Masters

☐ Doctorate

☐ Other

What is your organization type?

☐ Banks

☐ CPA firms

☐ Companies

How long have you used computers?

☐ Years ☐ Months

What is your spreadsheet application at work?

☐ Excel

☐ Lotus 1 2 3

☐ Quattro Pro

☐ Supercalc

☐ Symphony

☐ Other

How long have you used spreadsheets? ☐ Years ☐ Months

How long have you used spreadsheets software for your job?

☐ Years ☐ Months

Part Two

Please circle the most appropriate number of each statement which corresponds most closely to your desired response.

	Never	Sometimes	Often
Edit commands (e.g. copy and past)	1	2	3
Graphics	1	2	3
Database commands	1	2	3
IF commands	1	2	3
Algebraic commands	1	2	3
Operations research commands	1	2	3
Macros	1	2	3
Data commands (e.g. import and export data)	1	2	3
Merging spreadsheet files	1	2	3
Basic record-keeping	1	2	3
Payroll calculations	1	2	3
Zakat and taxes calculations	1	2	3
Depreciation schedules	1	2	3
Financial accounts	1	2	3
Variance analysis	1	2	3
CVP analysis	1	2	3
Operating budget	1	2	3
Capital budget	1	2	3
Management reports	1	2	3

Part Three

Please circle the most appropriate number of each statement which corresponds most closely to your desired response.

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
Using the spreadsheet software in my job enables me to accomplish tasks more quickly.	1	2	3	4	5
Using the spreadsheet software improves my job performance.	1	2	3	4	5
Using the spreadsheet software in my job increases my productivity.	1	2	3	4	5
Using the spreadsheet software enhances my effectiveness on the job.	1	2	3	4	5
Using the spreadsheet software makes it easier to do my job.	1	2	3	4	5
I find the spreadsheet software useful in my job	1	2	3	4	5
Learning to operate the spreadsheet software is easy for me.	1	2	3	4	5
I find it easy to get the spreadsheet software to do what I want it to do.	1	2	3	4	5
It is easy for me to become skilful at using the spreadsheet software	1	2	3	4	5
I find it easy to understand the spreadsheet terms	1	2	3	4	5
I find it easy to understand the spreadsheet notes	1	2	3	4	5
I find it easy to understand the spreadsheet graphics	1	2	3	4	5
I find the spreadsheet software easy to use.	1	2	3	4	5

Part Four

Please circle the most appropriate number of each statement which corresponds most closely to your desired response.

How frequently did you use spreadsheets in the past 30 days?

1	2	3	4	5	6
Less than once a month	Once a month	A few times a month	A few times a week	About once a day	Several times a day

How much time (in an average work day) did you use spreadsheets in the past 30 days?

1	2	3	4	5	6
Almost never	Leas than ½ hour	From ½-1 hour	1-2 hours	2-3 hours	More than 3 hours

دراسة ميدانية لاستخدام المحاسبين لبرامج الجداول الإلكترونية
في المملكة العربية السعودية

محمد حمد المغيولي

أستاذ مساعد، قسم المحاسبة، كلية العلوم الإدارية، جامعة الملك سعود،

ص. ب. ٢٤٥٩، الرياض ١١٤٥١، المملكة العربية السعودية

ملخص البحث. أدت التطـورات السـريعة فـي صـناعة الحـاسـبات الشخصـية إلـى انتشـار استخدام البرامج التطبيقية مثل بـرامج معالجـة الكلمـات (Word-Processing) وبـرامج الجداول الإلكترونيـة (Spreadsheets) في المنشـآت والتنظيمـات المختلفة. ونتيجـة لذلك أصـبح لا بـد للمحاسب الموظف ولدارسي المحاسبة أن يلم بالمهارات والمتطلبـات التي تسـاعـده على أداء مهامـه بسـرعة وكفاءة، وأهم هذه المهـارات استخدام بـرامج الجداول الإلكترونيـة (Spreadsheets) مثل بـرامج الإكسـل (Excel) ولـوتس ١٢٣(123 Lotus) وكواترو بـروا (Quattro Pro). ويهـدف هذا البحث إلى دراسة الاستخدام الفعلي لبـرامج الجداول الإلكترونية من قبل المحاسبين السعوديين. ويتضمن البحث استخدام نموذج (Davis (1986 والمسمى "نموذج تقبـل تكنولوجيـا المعلومـات" (Technology Acceptance Model) في تفسير سلوك أفراد العينـة بشـأن قبـول أو رفض استخدام بـرامج الجداول الإلكترونيـة. وبينت نتـائج الدراسـة أن برنـامج إكسل مـن شركة مايكروسـوفت (Microsoft) وأوامـر التحرير والـدوال والرسـوم البيانية وإدارة البيانات هي الأكثر استخداماً من قبل المحاسبين السعوديين. وكذلك بينت النتـائج أن المحاسـبين السـعوديين يسـتعينون ببـرامج الجـداول الإلكترونيـة لتنفيـذ بعض عمليات مسك الدفاتر البسيطة وفي حساب الاستهلاكات المتنوعة.

وبـاستخدام نمـوذج (1986) Davis وأسـلوب الانحـدار الخطـي- مـع وجـود استخدام برامج الجداول الإلكترونية كمتغير تابع، والقناعة بفائدة وسهولة استخدامها- كمتغيرين

مستقلين، تبين نتائج الدراسة أن النموذج بشكل عام يقدم تفسيرا ذا معنوية إحصائية لسلوك المحاسبين السعوديين تجاه استخدام برامج الجداول الإلكترونية.وعلى الرغم من حدود البحث، إلا أن هذه الدراسة تعتبر إضافة إلى الأدب المحاسبي وتكنولوجيا المعلومات نظرا لفائدة نتائجها في موضوع تطوير منهج أقسام المحاسبة في الجامعات السعودية، وفي موضوع تصميم برامج التدريب.