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EFFECT OF PERCEPTION AND PERSONAL TRAITS ON COMPUTER TECHNOLOGY ADOPTION BY WOMEN ENTREPRENEURS IN MALAYSIA

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ABSTRACT

This paper examines the role of perception (e.g. perceived usefulness and perceived ease of use) and entrepreneurial traits (such as, innovativeness, risk-taking propensity, perseverance, and flexibility) on computer technology adoption by women entrepreneurs in Malaysia. Members of the national association of women entrepreneurs in Malaysia (NAWEM) were surveyed. The findings show that women entrepreneurs are driven by instrumentality in technology adoption. Contrary to the process orientation reported in previous studies for women in general, Malaysia women entrepreneurs are outcome oriented in technology adoption. Innovativeness and risk-taking propensity are the key influential traits. Important implications on theory and practice are discussed.

KEY WORDS: Women Entrepreneurs. Perception. Entrepreneurial Traits. Computer Technology Adoption. Malaysia

INTRODUCTION

While advances in technology continue with rapidity, the use of these upcoming technologies has fallen below expectations (Ndubisi, Gupta & Massoud, 2003; Johansen & Swigart, 1996; Wiener, 1993; Moore, 1991) and has been identified as one of the plausible explanations for the productivity paradox (Sichel, 1997; Landauer, 1995). A number of studies have shown that successful investment in technology can reap immense benefits for the adopting individuals and organisations. On the basis of these benefits, various governments are taking steps to motivate the business community particularly entrepreneurs, to take advantage of the benefits of these technological advances. However, despite these significant technological advances and increasing governmental investments in promoting technology adoption at individual and organizational levels, it is still unclear, the extent of computer technology adoption among Malaysia women entrepreneurs, the determinants of usage, and the role of personal traits. Clearly, understanding the determinant structure of these key variables is critical for researchers, entrepreneurs, as well as systems developers and vendors targeting entrepreneurs.

The focus of this research on women entrepreneurs reflects the growing number and importance of women owned businesses in Malaysia, and is precipitated by the dearth of well-deserved research on this important sector. Besides, entrepreneurs have been reported in personality and psychological research as exhibiting unique traits that distinguish them from others; these traits could have different implications on their computer technology adoption.

In this study, perceived usefulness and ease of use (two key constructs in the technology acceptance model) along with entrepreneurial traits were investigated to understand their roles in the adoption of computer technologies by Malaysia women entrepreneurs. Studies comparing the salience of perceived usefulness and ease of use between male and female users of technology have shown that perceived usefulness is more important for male users while female users emphasize ease of use in technology usage decisions. For example, Venkatesh et al., (2000) reported higher instrumentality (i.e. outcome) for men and higher process orientation (ease of use/difficulty) for women in technology adoption decisions. Hennig and Jardim (1977), Rotter and Portugal (1969) had earlier shown that women tended to focus on the methods used to accomplish a task – suggesting a greater process orientation. Given the process-orientation reported of women generically in some of the past studies, it is important to examine whether the preponderance of ease of use over usefulness in computer technology adoption also applies to women entrepreneurs, given their unique personal traits. We also examined the effect of these traits on adoption.

REVIEW OF EXTANT LITERATURE

A number of models have been developed to investigate and understand the factors affecting the acceptance of computer technology in organisations such as the Theory of Reasoned Action - TRA (e.g. Fishbein & Ajzen 1975; Ajzen & Fishbein 1980), the Technology Acceptance Model – TAM (e.g. Davis 1989; Davis et al., 1989), the Theory of Planned Behaviour – TPB (e.g. Ajzen 1991; Mathieson 1991), the Model of PC Utilisation (Thompson, Higgins, & Howell 1991), the Decomposed Theory of Planned Behaviour (e.g. Taylor & Todd 1995), Innovation Diffusion Theory (e.g. Agarwal & Prasad, 1997; Brancheau & Wetherbe, 1990; Rogers, 1995), and recently The Moguls Model of Computing (Ndubisi, Gupta & Ndubisi, 2005). Some

of these studies were carried out at the individual level (e.g. Agarwal & Prasad, 1998), and some at the organisational level (e.g. Cooper & Zmud, 1990).

The theoretical model employed in this research is the technology acceptance model (TAM). The study focuses on the TAM because it helps to understand the role of perceptions such as usefulness and ease of use in determining technology adoption. TAM theorises that external variables influence behavioural intention to use, and actual usage of technologies, indirectly through their influence on perceived usefulness and perceived ease of use. Two important TAM constructs are perceived usefulness and perceived ease of use. Davis (1989, p320), defined perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her productivity”, and perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort”. A significant body of TAM studies has shown that perceived usefulness and perceived ease of use are determinants of usage (e.g. Davis 1989; Mathieson 1991; Adams et al. 1992; Segars & Groover 1993; Szajna 1994; Igbaria et al. 1997). Technology adoption decisions have been typically characterised by a strong productivity orientation (Venkatesh and Brown, 2001). In many studies (e.g. Mathieson 1991; Agarwal and Prasad 1997; Igbaria et al. 1997), perceived usefulness, one of the constructs related to the use-productivity contingency has emerged as one of the strongest predictors of adoption and usage behaviour.

Although TAM is recognized for its parsimony and predictive power, it has also been reported that while parsimony is TAM’s strength, it is also the models salient constraint. For example, Venkatesh (2000) asserted that while TAM is powerful in helping to predict acceptance, it does not help understand and explain acceptance in ways that guide development beyond suggesting that system characteristics impact usefulness and ease of use, thereby placing a limitation on the ability to meaningfully design interventions to promote acceptance. Mathieson (1991) believed that TAM is predictive but its generality does not provide sufficient understanding from the standpoint of providing system designers with the information necessary to create user acceptance of new systems. Furthermore, Straub et al. (1995) questioned intention as a predictor of actual behaviour. Bentler and Speckart (1979), and Songer-Nocks, (1976) earlier disagreed with

Fishbein and Ajzen's assertion (on which TAM is based) that attitudes and norms can influence behaviour only indirectly through behavioural intention.

Nevertheless, the TAM is one of the most popular technology usage models with numerous adaptations and replications. TAM has also been compared with other models (see for example, Taylor and Todd 1995; Ndubisi 2005) and found to be more robust in predicting user acceptance of different technologies. The model remains the most suitable for measuring usefulness and ease of use perceptions which are salient constructs in this research. However, in response to the call by past TAM researchers for future research to use actual usage instead of usage intention to test the TAM, the present study touts this line of suggestion by investigating actual or current usage as the dependent variable. Two hypotheses were framed to test the effect of perceptions on computer technology adoption by women entrepreneurs in Malaysia.

Hypothesis 1a: There is a significant direct positive relationship between perceived usefulness and computer technology adoption.

Hypothesis 1b: There is a significant direct positive relationship between perceived ease of use and computer technology adoption.

Women and IT Usage Decisions

Research has shown that women exhibit more "feminine" traits (e.g. tenderness) (Bem, 1981). The meta-analysis of Taylor and Hall (1982) suggested that these feminine traits correlate with "expressive" behaviors. Some past studies claimed that perceived usefulness is more important to male users of technology, while perceived ease of use is more salient for female users, which suggests an outcome orientation of male and process orientation of female users of computer technologies. There is substantial evidence in organizational behavior and management information systems research (e.g. Davis, 1989; Davis et al., 1989; Mathieson, 1991; Taylor & Todd, 1995) suggesting that the key underlying cognition determining an individual's attitude toward the behavior of adopting and using a new technology in the workplace is her/his perceptions about the usefulness of the technology. Specifically, the link between usefulness perceptions and attitude toward using a new technology has been shown to have path coefficients ranging from .50 (Davis et al., 1989) to .79 (Taylor & Todd, 1995). Given these strong results, it could be concluded that an individual's

attitude toward using a technology in the workplace reflects instrumentality and intrinsic motivation to use technology.

Venkatesh et al., (2000) reported higher instrumentality (i.e. outcome) for men and higher process orientation (ease of use/difficulty) for women as determinants of technology adoption. Their finding supports the notion of earlier research (such as Hennig & Jardim, 1977; Rotter & Portugal, 1969) that women tend to focus on the methods used to accomplish a task – suggesting a greater process orientation. Given the process-orientation of women and the lower levels of control (see Mirowsky & Ross, 1990) generally perceived by women in the work environment, the perceived ease of use or difficulty of using technology is expected to have an important influence over their decisions to adopt or reject a new technology (Venkatesh et al., 2000). Further, there is evidence to suggest that women display somewhat higher levels of computer anxiety (Bozionelos, 1996; Morrow, et al., 1986) and lower computer aptitude (Felter, 1985) compared to men (Chen, 1985). Both computer anxiety and computer aptitude have been related to perceptions of effort, thus suggesting that constraints to technology use (perceived difficulty) will be more salient to women. It is implicit therefore, that ease of use is more important than usefulness to women in technology adoption if women are more interested in process than outcome. However, a body of research has shown that entrepreneurs possess unique personal traits. These traits could play important roles in the perception and adoption of computer technology adoption by women entrepreneurs in Malaysia.

Entrepreneurial Traits

The traits suggested by previous empirical research which describe entrepreneurs are: (1) high need for achievement (Decarlo & Lyons, 1979; Hornaday & Aboud, 1971; among many others); (2) internal locus of control (Hornaday & Aboud, 1971; Miller, 1983); (3) high need for independence and effective leadership (DeCarlo & Lyons, 1979; Hornaday & Aboud, 1971); (4) high need for autonomy (DeCarlo & Lyons, 1979; Sexton & Bowman, 1983, 1984); (5) information processing capability (McGaffey & Christy, 1975); (6) preference for moderate level of risks (McBer & Co., 1986); (7) low conformity (DeCarlo & Lyons, 1979; Sexton & Bowman, 1983, 1984); (8) aggression, support, and benevolence (DeCarlo & Lyons,

1979); (9) energy level, risk-taking, and change (Sexton & Bowman, 1983, 1984); (10) dominance, endurance, innovation, self-esteem, low anxiety level, and cognitive structure (Sexton & Bowman 1983); and (11) low interpersonal effect, social adroitness, low harm avoidance, and low succorance (Sexton and Bowman, 1984).

Yonekura (1984) in the discussion paper on “Entrepreneurship and Innovative Behaviour of Kawasaki Steel” suggested the following traits: assertiveness, insistence, forward-looking, critical thinking, creativity, innovation, continuity, preparedness, responsibility, open-mindedness, etc. Burch (1986) mentioned nine salient traits, which dictated a high propensity for one to behave entrepreneurially. They are: a desire to achieve, hard work, nurturing quality, able to accept responsibilities, reward oriented, optimistic, excellence-oriented, an organiser, and money oriented.

From the review of literature it is observed that innovation, risk-taking propensity, perseverance, and flexibility are more common and consistently reported traits among entrepreneurs. Table 1 shows a summary of some of the previous studies on the four entrepreneurial traits.

Table 1: Entrepreneurial Traits Reported in Previous Research

Entrepreneurial Traits	Author	Comment
Risk taking, Low harm avoidance	McClelland (1961); Ansoff (1972); Sexton & Bowman (1983; 1984); McBer & Co. (1986); Jantan et al. (2001); Ndubisi & Jantan (2003); Ndubisi et al. (2005).	Majority of the authors argued for high risk-taking propensity of entrepreneurs, and few think entrepreneurs take calculated risks.
Innovativeness or Low Conformity	McClelland (1961); Decarlo & Lyons (1979); Stevenson (1983); Sexton & Bowman (1983; 1984);	Going by the number of authors listed here, it is clear that many agree that innovativeness is one of the most

	Yonekura (1984), McBer & Co (1986); Jacobson (1993); Harper (1996); Kitchel (1997); Schumpeter (2000); Jantan et al. (2001); Ndubisi & Richardson (2002).	common traits of entrepreneurs.
Flexibility or Change	Sexton & Bowman (1983; 1984); Kitchel (1997); Jantan et al. (2001); Ndubisi & Richardson (2002); Ndubisi & Jantan (2003); Ndubisi et al. (2005).	Flexibility has received much evidence as an entrepreneurial trait as did innovativeness, risk-taking and perseverance. Yet it is still attracting more research attention.
Perseverance/endurance , High energy level	McClelland (1961); Stevenson (1983); Sexton & Bowman (1983; 1984); Yonekura (1984); Burch (1986); McBer & Co (1986); Wells (1994); Henzel (1995); Kitchel (1997); Glick-Smith (1999); Jantan et al. (2001); Ndubisi & Jantan (2003)	Another common trait of entrepreneurs is perseverance. With innovativeness, risk-taking and flexibility, perseverance form the set of most common entrepreneur traits. Hence, justifying their selection for the purpose of the current research.

The entrepreneurial role has long been recognized as a prime source of innovation or creativity. For many entrepreneurs, the basic drive is creativity and innovation to build something out of nothing. They are always looking for something unique to fill a need or want (Ndubisi et al. 2003). Thus, more innovative women entrepreneurs are more likely to adopt computer technologies. It is therefore hypothesized as follows:

Hypothesis 2a: There is a significant direct positive relationship between innovativeness and computer technology adoption.

Risk refers to the uncertainty of outcomes of an organisations resource commitment. Women entrepreneurs with higher risk-taking propensity are more likely to meddle with matters of uncertain outcomes. It has been reported that organisational innovations result from, among other factors, risk taking in organisations. According to Nohria and Gulati (1997) and Singh (1986), innovation can often result from successful risk taking. Hence, the higher the risk-taking propensity of the entrepreneur, the more likely she is to experiment with computer technology and to eventually adopt it. This leads to the next hypothesis:

Hypothesis 2b: There is a significant direct positive relationship between risk-taking propensity and computer technology adoption.

Perseverance is the ability to continue doing something one believes in for an extended period, enduring difficulties, and finding a solution when facing a barrier (Ndubisi et al. 2005). Kitchel, (1997) reported that a CEO whose perseverance level is high keeps on working on achieving goals despite repeated failures. Thus, computer technology adoption is likely to be greater among more persistent women entrepreneurs. This assumption is captured in the following hypothesis:

Hypothesis 2c: There is a significant direct positive relationship between perseverance and computer technology adoption.

Lastly, the extent of flexibility exhibited by women entrepreneurs could have some implications on their technology adoption. More flexible women entrepreneurs are likely to adapt more easily to rapid technological obsolescence. Depending on the frequency of technology replacement or upgrading need, the more flexible entrepreneurs may have a more rapid adoption. McCalman and Paton (1992) asserted that technological change due to its dynamic impact on existing system and also its threatening image can create many challenges for the change agent. While such challenges may deter less flexible users, more flexible entrepreneurs are more likely to flow with technological fad. Hence, the next hypothesis will be verified:

Hypothesis 2d: There is a significant direct positive relationship between flexibility and computer technology adoption.

METHODOLOGY

Participants & Procedure

The population of study consists of women entrepreneurs that are members of the National Association of Women Entrepreneurs of Malaysia – (NAWEM). The list of members of NAWEM was taken from the NAWEM Business Directory. The women entrepreneurs were surveyed using structured questionnaire. All the one hundred and twenty-five members of NAWEM were contacted to participate in the survey. Each was sent a copy of the questionnaire, and seventy-four (59.2%) usable responses were received.

The design of the questionnaire took the approach of that by Davis et al. (1989), which has been adapted by many other researchers (such as Venkatesh and Davis 1996, Igbaria et al. 1995; 1997; Ndubisi et al 2003), but in this study with modifications to capture the hypothesised effect of entrepreneurial traits. Part 1 measured actual system usage with two indicators, the number of computer supported business tasks performed and the number of different software applications used. In line with International Coalition of Library Consortia (ICOLC) (1998), the indicators used in enhancing the reliability of measuring the system usage were specifically: (1) use of a wide variety of software packages in CBIS environment (e.g. spread sheet, word processing, graphic, data processing, etc); and (2) the number of business task performed using systems such as budgeting, planning, analysis and forecasting. Achieved reliability measure was Cronbach's Alpha 0.83.

Parts 2 and 3 respectively measured perceived usefulness and perceived ease of use. Perceived usefulness indicators were improvement on job performance, increase in productivity, enhancement of job effectiveness, and system usefulness in the job. Indicators of perceived ease of use included; clear and understandable interaction with system, system compliance to commands, minimal mental effort in interacting with the system, finding the system easy to use. These indicators were adopted from Davis et al. (1989),

with reliability estimates of $\alpha = .90$ for perceived usefulness and $\alpha = .88$ for perceived ease of use.

Part 4 measured the traits of the entrepreneur. Entrepreneurial traits in this study included innovativeness, risk-taking propensity, persistence/perseverance, and flexibility. Traits items were adapted from Kitchel (1997) and Harper (1996). The following items were used to measure innovativeness (e.g. acting to diversify business, products, or service into new fields; finding a unique way to solve problems; producing new ideas or innovative solutions and trying out new ideas); risk-taking propensity (for instance not hesitating to put money into new business that could fail if the possible reward is high; seeing risk-taking as an integral part of a challenging career, willingness to take profitable business risk); perseverance (don't easily give up on things, even on very difficult tasks; having staying power to do work that requires long hours and hard work; looking for alternative solutions when one fails); flexibility (willingness to apply changes that will bring better results; willingness to change position even on important issues, if faced with a good argument; not afraid of change). The reliability of the items was confirmed based on the following alpha values: innovativeness (.92), risk-taking propensity (.83), perseverance (.70), and flexibility (.82). Part 5 measured the demographic variable using single items such as: age, educational background, job function, primary business activity, period of establishment, number of employees, and prior computer experience (Ndubisi et al 2003). For parts 2-4, respondents were asked to indicate the extent of agreement and disagreement on a five-point Likert scale ranging from (1) "strongly disagree to (5) "strongly agree". The schema of the proposed relationships and p-values are schematized as Figure 1.

RESULTS

Respondents are engaged in various activities, from manufacturing, to sales, education, interior decoration, fashion designing, etc. Seventy-three percent of the entrepreneurial ventures have been established for over five years, 20.3% and 79.7% are respectively in the manufacturing and service sectors, 89.2% are employing less than one hundred staffs, and 84.6% are owner-managed. A total of 58.1% of the entrepreneurs are graduates, 43.2% are below forty years while the rest are forty years or more. There are more

Chinese (64.9%) than Malay (32.4%) and Indian (2.7%) women entrepreneurs.

IT Usage Pattern

The results in Table 2 show that all respondents (100%) are using word processor, 73% are using electronic mail, 57% are using application packages, and so on. Job tasks where systems are used are letters and memos (88%), producing reports (77%), internal communication (66%), data storage/retrieval (62%), budgeting (49%), controlling & guiding activities (47%), etc. It is observed that 59.5% of respondents are using a minimum of four out of the seven varieties of systems presented, and 54.1% are using a system for at least five out of the ten job tasks.

Table 2: IT Usage

System Variety	Percentage of respondents using	Specific Job Tasks	Percentage of respondents using
Word processing	100	Letters and memos	87.8
Electronic mail	73.0	Producing report	77.0
Application Packages	56.8	Communication with others	66.2
Graphics	41.9	Data storage/retrieval	62.2
Spreadsheets	40.5	Budgeting	48.6
Databases	40.5	Controlling & guiding activities	47.3
Programming Languages	31.1	Planning/forecasting	44.6
		Making decisions	43.2
		Analyzing trends	41.9
		Analyzing problems/alternatives	24.3

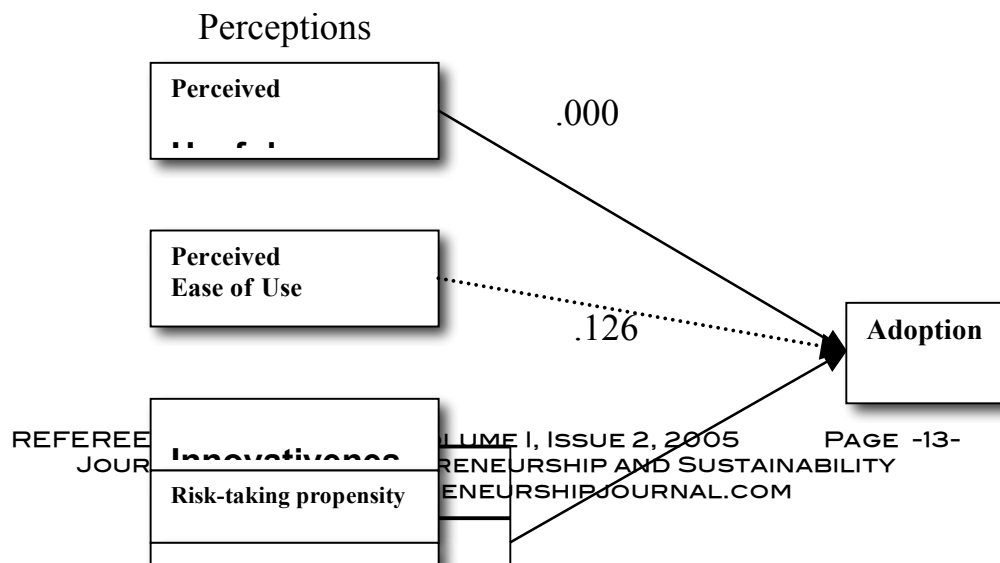
System variety was subsequently combined into two larger groups as follows: Basic Systems (namely, word processing, electronic mail,

spreadsheets, graphics, & databases), and Advanced Systems (e.g. application packages & programming languages). Specific job tasks were grouped into those for administrative purposes (such as producing reports, letters & memos, data storage/retrieval, & communication with others), planning purposes (e.g. analyzing trends, planning/forecasting, analyzing problems/alternatives, & making decisions), and control purposes (e.g. budgeting, controlling & guiding activities). All the respondents are using at least one basic system, and 58.1% of respondents are using a minimum of one advanced system. A computer system is in use for at least one administrative task by all respondents, 59.5% of respondents are using an application for at least one planning and control task.

Relationship Testing

The multiple regression analysis was employed to analyse the relationships in the model and the results are summarised and schematised in Figure 1 below.

Figure 1: Relationships among Perceptions, Traits and Adoption (with P-values)



Traits

.000

.048

.873

.631

From Table 3 it is observed that perceived usefulness and ease of use contribute significantly ($F = 8.53$; $p < .001$) and predict 20 percent of the variations in technology adoption by women entrepreneurs. Details of the result show that perceived usefulness has significant positive relationship with technology adoption ($t\text{-value} = 3.93$; $p < .001$), while perceived ease of use does not ($t\text{-value} = -1.55$; $p > .05$). Thus, there is sufficient evidence to accept hypothesis 1a and to reject hypothesis 1b. The above values for usefulness and ease of use indicate that perceived usefulness is more salient than perceived ease of use in technology adoption by women entrepreneurs.

Table 3: Perceived Ease of use and IT Usage (via Perceived Usefulness)

Perception	t-value	p-value
Perceived usefulness	3.93	.000
Perceived ease of use	1.55	.126

$R^2 = .20$ $F = 8.53$ $F \text{ Sig.} = .000$

Entrepreneurial Traits and Adoption

Table 4 summarizes the regression analysis of the relationship between traits and computer technology adoption.

Table 4: Entrepreneurial Traits on Adoption

Traits	t-value	p-value
Innovativeness	3.69	.000

Risk-taking propensity	2.02	.048
Perseverance	-.160	.873
Flexibility	.483	.631

$R^2 = .58$ $F = 24.03$ $F \text{ Sig.} = .000$

Entrepreneurial traits namely innovativeness, risk-taking propensity, perseverance, and flexibility contribute significantly ($F = 24.03$; $p < .001$) and predict 58 percent of the variations in computer technology adoption by Malaysia women entrepreneurs. It is further observed that innovativeness (t-value = 3.69; $p < .001$) and risk-taking propensity (t-value = 2.02; $p < .048$) are significantly related to adoption, hence we accept hypotheses 2a and 2b. Both innovativeness and risk-taking propensity are important determinants of technology adoption among women entrepreneurs in Malaysia. Perseverance (p-value = .873) and flexibility (p-value = .631) are not significant drivers at 5 percent significance level, which leads to rejection of hypotheses 2c and 2d.

DISCUSSION

The findings show that Malaysian women entrepreneurs' adoption of computer technology is driven directly by their perception of the system's usefulness and indirectly (via perceived usefulness) by perceived ease of use. Women entrepreneurs in this study deem easy to use systems as useful systems and in turn adopt. In fact, ease of use in itself is not a determinant of adoption, but becomes influential when easy to use systems are perceived as useful systems. These findings are also consistent with Ndubisi et al., (2003) and Ndubisi et al (2005).

The lack of direct influence of ease of use on adoption is contrary to the postulation of the technology acceptance model, but plausibly explained by the outcome orientation of entrepreneurs. As shown in the literature, entrepreneurs, have a high need for achievement (Decarlo & Lyons 1979; Hornaday & Aboud 1971; Burch 1986, etc). Such a desire to succeed, plausibly explains why they tend to adopt useful systems. In other words, the need to achieve goals causes perceived usefulness to overshadow system's difficulty in use, thereby ensuring that the system is adopted.

Another interesting finding of this research is the difference in antecedents of adoption between women entrepreneurs and other female (non-entrepreneurs) technology users. Venkatesh et al (2000) reported higher process orientation (ease of use) for women generally in technology adoption. Earlier, Hennig and Jardim (1977); Rotter and Portugal (1969) reported that women tend to focus on the methods used to accomplish a task. The evidence from the present research shows otherwise. It is clear from the current study that women entrepreneurs are somewhat different from other women (non-entrepreneurs) in the earlier studies in that they are outcome oriented more than process oriented. In fact women entrepreneurs in this study focus on outcomes rather than processes in making technology adoption decisions.

Two important traits that bear on women entrepreneurs' technology adoption are innovativeness and risk-taking propensity. Clearly, both traits are directly associated with adoption. Specifically, the higher the risk-taking propensity of women entrepreneurs, the greater the level of adoption. It has been reported in prior research that women display somewhat higher levels of anxiety (Bozionelos 1996), which is inversely correlated with computer aptitude (Felter 1985) and technology adoption. However, women entrepreneurs are different. Just like other entrepreneurs, women entrepreneurs exhibit a low anxiety level and high risk-taking propensity (Sexton & Bowman, 1983, 1984), which translates to greater computer technology adoption as shown in this study. This is because low risk aversion has the potential to create a favourable atmosphere for adoption by eliminating anxiety and phobia for uncertainty, thereby making women entrepreneurs more willing and ready to tryout new technologies. As trial rate increases, so does acceptance, all things being equal.

Similarly, more innovative women entrepreneurs tend to make greater use of computer technologies. Rogers (1995) in his innovation diffusion theory described innovators as initiators or originators of innovations and ideas. Innovators generally lead the way and others follow their footsteps, and even when there are no followers, innovators move on. Such revolutionary persona, which has been associated with entrepreneurs, proves to be an important factor in the adoption of computer technology by Malaysia women entrepreneurs. Innovativeness has also been associated with high risk-taking propensity. Since innovators are always at the forefront, they

shoulder a higher risk of uncertainty, which others may not experience eventually. Therefore, adopting new technologies is not surprisingly a function of innovativeness and risk-taking propensity of women entrepreneurs.

With regards to perseverance and flexibility, both traits have no important impact on adoption. Clearly entrepreneurs' perseverance and flexibility do not lead to enhanced technology adoption. High level of perseverance can lead to sticking to an older technology and reluctance to experiment with novel ones, while flexibility can lead to openness to new ideas but not necessarily its acceptance. These are logical reasons why perseverance and flexibility traits are not key computer technology adoption factors among women entrepreneurs in Malaysia.

STRENGTH, WEAKNESS AND FUTURE RESEARCH

Some of the strengths of this research are highlighted. Firstly, the data are based on a poll of entrepreneurs who are officially recognised as Malaysian entrepreneurs by their membership of the national association of women entrepreneurs in Malaysia (NAWEM). Secondly, the model is based on theory grounded on existing management information system studies – the TAM model. Moreover, actual IT usage was used rather than usage intention (as a predictor of usage behaviour), which has been questioned by some scholars.

This research focuses on women entrepreneurs only. To some, this may be considered a limitation. However, this arguable limitation is defensible. This study deliberately studied only women entrepreneurs because of the small amount of research in this sector compared to their male counterparts. Secondly, as more and more women are setting up entrepreneurial ventures in Malaysia in recent times, many of which are availing the benefits of computer technologies, it is becoming increasingly vital to unveil the specific (women) entrepreneur factors of adoption (rather than a pooled information about both sex) that will assist in designing strategies for approaching this niche market. Nevertheless, future research could be geared towards a comparative study of male and female entrepreneurs in Malaysia to examine if there are any differences in their technology adoption and adoption drivers. It is also necessary to examine the moderation effects of

gender in the relationship between perceived usefulness, perceived ease of use, traits and computer technology adoption.

IMPLICATIONS AND CONCLUSIONS

Theoretically, this work supports the theorization of the technology acceptance model that perceived usefulness is directly related to technology adoption, and perceived ease of use is indirectly (via perceived usefulness) associated with adoption. Further, contrary to the ease of use-adoption relationship in the TAM model, there is no evidence among Malaysia women entrepreneurs in this study. The research findings also challenge current theory on the process orientation of women with respect to technology adoption as well as the focus of women on the methods used to accomplish a task as against the outcome of undertaking the task. Clearly, the findings of this research show that for women entrepreneurs, perceived usefulness is much more important than perceived ease of use. Thus, women entrepreneurs are outcome oriented (not process oriented) and also focus on the result rather than the method used to accomplish a task. The end is more important than the means. Entrepreneurial traits namely, innovativeness and risk-taking propensity have shown strong evidence as important personality factors of computer technology adoption by women entrepreneurs. This evidence adds value to the current knowledge in this field.

Practical implications of the research are discussed next. First, with regards to the management of technology in entrepreneurial ventures, (women) entrepreneurs should invest in useful systems; such investments should not be hindered by slight system's complexity or difficulty. There is evidence that such perceived difficulty usually fades away with time as users gain more and more experience with the specific system. Further, as ease of use is not a key direct factor of adoption women entrepreneurs should not place priority to ease of use in making technology adoption decisions, instead, beneficial outcomes of such applications should be emphasized.

Systems developers and marketers on their part should supply visibly beneficial systems. The strong direct impact of system's perceived usefulness and indirect impact of perceived ease of use suggests important strategies for market oriented systems designers and marketers. They should in addition to providing useful systems also deliver user friendly

technologies. Since easy to use systems are deemed useful systems and consequently adopted, designers and vendors should not neglect the ease of use factor. This is because albeit this factor has no direct influence on adoption, it anchors perceived usefulness, which directly predicts adoption.

In conclusion, it is germane to reiterate some of the discoveries made in this study. Women entrepreneurs are outcome oriented in their technology adoption decisions. They focus more on the beneficial outcomes rather than on ease or difficulty of use process. They emphasize the end rather than the means to the end, which is contrary to what has been reported for other women (non-entrepreneurs) in previous research. Innovativeness and risk-taking propensity are influential traits in technology adoption decisions. These traits can be capitalised on in attempting to create a favourable environment for computer technology adoption among Malaysia women entrepreneurs. Hence, entrepreneurial traits, user perceptions of system's usefulness and (indirectly) ease of use are potent keys to understanding the technology adoption decision processes of women entrepreneurs in Malaysia.

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