Innovation and the Impact of Technology on Women Entrepreneurs in Small and Medium Enterprises in Singapore

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Abstract: Women entrepreneurs are making significant contributions to business and economic growth. The realization of the importance of entrepreneurs and innovation as the prime engines of Singapore's economic progress was realized as far back as in the 1960s. Women entrepreneurs are an untapped resource and provide a growth engine for Singapore as they create employment and boost the economy. Enterprise, together with new products and innovation, is crucial for the country's economy. Entrepreneurs drive innovation, they speed up structural changes in the economy and force old incumbent firms to shape up thereby making an indirect contribution to productivity. Innovation is one of the most critical functions of entrepreneurship and it thrives within certain organizational cultures which are shaped by their leaders. The objective of this study is to examine how women entrepreneurs in Singapore have built an innovative organisational culture and how they have used technology to grow their businesses. Using a qualitative approach, this study examines the perception of twelve women entrepreneurs who own and manage small and medium-sized enterprises (SMEs) towards innovation and the use of technology in their business. In-depth interviews were conducted based on a semi-structured questionnaire with open-ended questions. The women entrepreneurs were identified based on certain criteria such as business ownership and demographic profile. Findings show that the women entrepreneurs who were interviewed were very innovative and also open to adopting new ideas and technology to improve and grow their business. The women entrepreneurs recognize the importance of technology for business development in the highly competitive market. They continue to train themselves and their employees to upgrade themselves as they realize that human capital is the driving force that propels the growth of their organizations. They feel that for their businesses to grow, it is vital to constantly innovate and improve human capital. The success and performance of their businesses were largely due to their management and leadership qualities which are prime movers of innovativeness. Implications of these findings for women entrepreneurs and policy implications are also discussed.

Key words: Women entrepreneurs · Innovation · Human capital · Singapore

INTRODUCTION

Women entrepreneurs are making significant contributions to business and economic growth [1-3]. According to the Singapore [4], there are 187 million women starting and running businesses in the 59 economies. As a part of this development, it has become clear that enterprises started and owned by women and women entrepreneurship are growing in importance [5].

Women entrepreneurs are an untapped resource and provide a growth engine for Singapore as they create employment and boost the economy. Enterprise, together with new products and innovation, is crucial for the country's economy. Small businesses have a major influence on the economy of the country, for the mere reason that they create jobs and provide an income for the population. Women entrepreneurs are important participants in Singapore's business sector. The number of self-employed residents in Singapore as at June 2012 was 15 percent of the total labour force [6]. The self-employed residents consisted of people who operate their own business without employing any paid workers, employers and contributing family workers.

Singapore is located in a fast growing region, South-east Asia. The business environment consists of a system of large state-owned enterprises,
government-linked companies (GLCs) and small and medium enterprises (SMEs). A small and medium sized enterprise is a business with annual sales turnover of not more than SS100 million or employment size of not more than 200 workers [7]. SMEs are the backbone of the Singapore economy and play a vital role in the economy. The SMEs form 99% of total enterprises, employ seven out of every ten workers and contribute to half of the national GDP [7]. The realization of the importance of entrepreneurs and innovation as the prime engines of Singapore’s economic progress was realized as far back as in the 1960s [8].

SPRING Singapore is an agency under the Ministry of Trade and Industry responsible for Singapore enterprises grow. SPRING helps enterprises in financing, capability and human capital development, technology and innovation and access to markets. Technology remains a critical driver in business growth for SMEs to improve productivity and remain competitive.

The purpose of this study is to examine how women entrepreneurs in Singapore have built an innovative organizational culture and how they use technology to grow their businesses. Research on women entrepreneurs in Singapore is scarce and this study will enhance the understanding towards women entrepreneurs.

**Literature Review**

**Technology Usage in Singapore:** Studies show that individuals and businesses can reap tremendous benefits from successful investment in technology. On the basis of these benefits, many governments have been encouraging their business communities, particularly entrepreneurs, to avail themselves of the benefits of these technological advances.

Singapore has embraced the Internet aggressively adopting a leadership role in the Asia-Pacific region and based on 2010 statistics, nearly 78% of the population was using the internet (Figure 1). Internet awareness in the population, has been estimated to be approaching 100%. The Singapore Internet market has continued to develop in a vigorous manner, overcoming such factors as a sluggish economic period a few years back.

Singapore is an example of a "smart nation" - one that uses data to enhance services. As technology becomes more pervasive around the world, countries have to embrace it, otherwise they will lag behind in their development. In recent years, the Singapore government’s use of the Internet to provide its services has grown significantly. Singapore has a well-established broadband infrastructure with fibre broadband network. There is internet access at home, work, schools and even in some public areas such as public libraries, community clubs, McDonalds, etc.

In Asia, Singapore is the 3rd largest user of the internet, after S. Korea (82.5%) and Japan (79.5). Singapore had 4 million users of the internet as at 30 June 2012 (75% of the population) and 2.9 million users on Facebook (54.5%) [9].


This study uses the Technology Acceptance Model to explain the acceptability of a tool, the system's usefulness and ease of use and the entrepreneurial traits of women entrepreneurs. The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology. Information systems consist of the network of all communication channels used within an organization.

The Technology Acceptance Model postulates that the use of a technology is determined by a number of factors about how and when they will use it - the behavioral intention, but on the other hand, that the behavioral intention is determined by the person's attitude towards the use of the system and also by his perception of its utility.
Perceived Usefulness: "The degree to which a person believes that using a particular system would enhance his or her job performance"[11].

Perceived Ease of Use: "The degree to which a person believes that using a particular system would be free from effort"[11].

The attitude of the user is an important factor affecting the success of the system [11] and it influenced by the perceived ease of use through self-efficacy and instrumentality.

Entrepreneurship and Innovation: Entrepreneurship contributes directly to economic growth through innovation and job creation Schumpeter [12], who contributed greatly to the study of innovation, argued that industries must incessantly revolutionize the economic structure from within, that is, innovate with better or more effective processes and products. Entrepreneurs drive innovation, they speed up structural changes in the economy and force old incumbent firms to shape up thereby making an indirect contribution to productivity. According to Shane and Venkataraman [13], entrepreneurship comprises two phenomena "enterprising individuals" and "entrepreneurial opportunities".

Innovation is the catalyst to development and growth in business. Innovation is the development of new value through solutions that meet new needs, or adding value to old customers by providing new ways of maximizing their current level of productivity. It is the catalyst to growth.

The prosperity of any Nation is a function of the effective utilization of its factors of production; land, capital, technology plus labour, including women’s labour. Singapore is a resource limited country and relies on its people for the growth of its economy. Small family businesses in Singapore run by owner managers and employing between ten and 100 workers make a significant contribution to the country’s economy[14].

Women Entrepreneurs in Singapore: A woman entrepreneur is defined as 'the female head of a business who has taken the initiative of launching a new venture, who is accepting the associated risks and the financial, administrative and social responsibilities and who is effectively in-charge of its day-to-day management'[15]. However, in this study, a woman entrepreneur is broadly defined as a female who is an owner-manager of a business.

Businesses owned by women are largely found in the small and medium sized (SMEs) enterprises in Singapore. A study of women entrepreneurs in Singapore, Maysami and Goby [16] showed that females contributed substantially to the development of small businesses. The businesses were in the service and retail industries. Majority of the women entrepreneurs had an average age of 41, were married and had an average of two children [16]. Most of the women had at least ten years of schooling, 50% had completed secondary-level education, 15% had professional or polytechnic qualifications and 35% had a first or postgraduate degree [17].

Lee [14] studied the motivation of women entrepreneurs in Singapore using the Theory of Needs [18]. She concluded that women entrepreneurs in Singapore are motivated by a high need for achievement, a medium need for power and a moderate need for affiliation and autonomy [14]. A study by Teo [17] found that women entrepreneurs in Singapore had internally-driven motivations such as the will to achieve, to grow, to experience fulfillment, autonomy and independence.

Women entrepreneurs in Singapore are heavily involved in the daily operations of their businesses [17]. Married women entrepreneurs have to handle multiple roles - as a wife and mother and as a business owner for the success of their business and welfare of their employees. Hence, these women entrepreneurs face work-family conflict since they have to manage both the work and family roles [19].
Motivation: Making money was not the main reason for women to launch their own business. A model of factors that motivate women to start their own business Orhan and Scott [20] showed a model of factors that motivate women to start their own business entrepreneurs by using the qualitative paradigm in 25 women entrepreneurs. They identified seven types of situations that motivate women to become entrepreneurs and they are: 1) dynastic compliance; 2) no other choice; 3) entrepreneur by chance; 4) natural succession; 5) forced entrepreneur; 6) informed entrepreneur; and 7) pure entrepreneur. While some women see the opportunity and seize it, there are women who have to carry on the family business or ‘dynasties’ because they are next in line to succeed the business.

The circumstances faced by female entrepreneurs to set up their own business comprise of “pull” and “push” factors[20]. “Pull” factors are entrepreneurial driven factors and are positive proactive motivations which relate to self-achievement or challenge, independence, wealth creation and social status. The women are "pulled" or "drawn" to the opportunities and brighter prospects and these women generally have control over their decisions to establish a business. On the other hand, some women might be "pushed" or "forced" to start business because of necessity. The main reasons women enjoy owning their own businesses are because they like the flexibility, can achieve their personal goals and have independence [11, 21].

Characteristics: The psychological characteristics of women entrepreneurs have been found to be similar to men business owners [22]. Personal characteristics of women entrepreneurs include autonomy, persistence, hard work, competitiveness, orientation to personal achievement and higher income, belief in one's own vision, goal-setting, risk-taking and leadership qualities [23, 24].

The ability of entrepreneurs to innovate relates to their innate traits, including propensity for risk-taking. The capabilities of innovating, introducing new technologies, increasing efficiency and productivity, or generating new products or services, are characteristic qualities of entrepreneurs Schumpeter [12].

Human Capital: Human capital "is the stock of knowledge and qualification, useful and valuable, embodied in the labor force, resulting from a process of education and professional training"[25] (p.249).Entrepreneurial human capital is the knowledge and personality attributes of individuals that are used to perform labour[26]. Human capital is important for the success of an organization [27, 28].Singapore relies on its people which is the country's biggest asset and resource. There is a lot of emphasis on education, training and life-long learning so as to increase knowledge and to enhance productivity.

Culture: According to Hofstede [29], countries such as Taiwan, Hong Kong and Singapore score highly on collectivism score and considerably lower in individualism than the countries in the Western world. Low [30] argues that there exists a synonymous match between the national culture and the business culture and this influences the way family-owned businesses are conducted in Singapore.

Methodology: The study is a descriptive and the approach is a qualitative one. The qualitative method enables the researcher to study selected issues in detail and in-depth [31]. Qualitative study is a more useful way to determine richer information with a small number of subjects.

In this study, the sample was limited to twelve women entrepreneurs in Singapore in the service industry. This is a multi-racial study and the sample consisted of twelve women entrepreneurs; eight Indian women, three Chinese women and one Malay woman. The sampling is not representative of the population of the country. Convenience sample was obtained using the snowballing technique starting with referrals from the Chamber of Commerce [25, 26]. The women entrepreneurs satisfied the selection criteria as they were Singapore citizens, own and run their businesses which are located in Singapore and have been in business for more than 5 years. Businesses have a higher mortality rate during the first and second years of existence [32].

A demographic sheet was designed to obtain personal and work history information of the women entrepreneurs. The face-to-face interviews included closed, semi and open-ended questions. The interviews took about one hour to complete and were conducted at their place of business.

RESULTS AND DISCUSSION

The study provides an insight into how and why women entrepreneurs make a decision about the adoption and use of information technologies in their businesses. In this study, no quantitative data was obtained from the respondents to measure business success as it was difficult to obtain such data since such information was treated as highly confidential. Starting a business is easy but the challenge is to keep the business and to grow the business. (Please refer to Appendix 1 for interview transcripts).
Demography: In this study, the demographic profile of the women entrepreneurs are between the ages 38 and 66. A large number were in their 30s and 40s. The majority (42%) of the women were married, with 25% single, 25% divorced and 8% widow. Most of the married women had from 1 child to 3 children. The women entrepreneurs who were single lived with their parents. The women were generally well-educated. Majority of the women (42%) held University degrees, 25% had attained secondary-level education, 25% junior college education and the remaining 8% a professional diploma. (Please refer to Appendix 2).

Regarding the businesses, 75% of the businesses were started by the women themselves; 17% of the businesses were family business and 8% was a franchise. The businesses are all in the service industry and consisted of retail, travel, securities, design and printing, beauty, E-Magazine, Spa and Wellness, Real Estate, Training and Education. Except for one woman, the rest of the women had previous working experience prior to entering into business. Other than the woman who had experience as a reservation clerk in a travel company, the remaining women entrepreneurs had work experience in businesses which were found to be significantly different than their own business. For the purpose of this study, the businesses can be considered as successful as they have been running from 5 years to 30 years.

Research indicates that women entrepreneurs have been categorized into four different typologies based on their entrepreneurial ideas and their acceptance of conventional gender roles - conventional entrepreneurs, domestic entrepreneurs, innovative entrepreneurs and radical entrepreneurs [33].

Type of Businesses: Women like to be in businesses which they are passionate about and which relate to their character and which help other women. The women entrepreneurs in the study are involved in businesses in the service industry which did not require high capital. Nevertheless, all the women interviewed mentioned lack of funds as their major constraint at the start-up stage. They had started their businesses using their savings and by borrowing money from family and friends. The businesses include 1) retail - decoration, meat, clothes 2) travel 3) design and printing 4) beauty 5) E-Magazine 6) Spa and wellness 7) real estate and 8) matchmaking service

Human Capital: The women entrepreneurs continue to upgrade their management skills and knowledge as they are contribute to the growth and the success of their business. They attend training and also send their employees for training so that that they will be able to perform and contribute to the performance of the business.

Challenges: Singapore women entrepreneurs face a variety of challenges at start-up and growth of their businesses related to finance. They had to rely on their savings and from borrowing from their friends and family to start their businesses [34]. The women admitted that they face work-family conflict [19] but with the support of their spouse, parents and family members, they have been able to run their businesses.

Usage of Technology: Individual perceptions of information technologies are likely to be influenced by the objective characteristics of technology, as well as interaction with other users. According to the TAM, perceived usefulness (advantages) and perceived ease of use (freedom from difficulty or great effort) are primary motivational factors for accepting and using new technologies. Perceived usefulness is the degree to which a person believes that use of technology will produce better outcomes [11]. Personal traits such as innovativeness and risk-taking propensity are significantly correlated with usage.

Investment in New Technology: Most of the women entrepreneurs interviewed were creative and innovative Schumpeter [12]. They designed new items for the business, created new products and new ways of doing the business and used new technology to increase better products to improve efficiency and productivity. These women entrepreneurs embraced new technology because they knew that it is the only way to improve and grow their business. Based on TAM, the key underlying factor that determined the women entrepreneurs’ attitudes toward the behaviour of adopting and using the new technology is their perception about the usefulness of the technology [11]. Their decision to adopt or use new technology was influenced by the high need for achievement [14, 18]. The women entrepreneurs availed of the Singapore Government’s grants for capabilities investment through Spring, Singapore. (Please refer to Appendix 3).

Personal Computer: The results of the analysis show that 100 percent of the respondents are using the personal computer. The women entrepreneurs were computer literate. All of them have personal computers and mobile telephones. They are aware of how information technology can help them shorten business processes, improve product quality, improve customer service and
increase marketability of their products and services. The women use computer technology to communicate with their suppliers and customers via technology such as by sending emails and SKYPE. They also use the computer to handle the administration purposes of the business such as planning and accounts.

**Website:** Majority of the women entrepreneurs (83%) have created the company's website on the internet. They explained that the company's website is a marketing tool and they use it to promote their business, products and services. Having a corporate website on the internet shows the world about the company's presence. However, 17% of the women entrepreneurs did not find the usefulness in having a corporate website and so the usage differed among computer experience and the nature of the business.

**Social Media:** For women entrepreneurs, it is important to have support systems and friends for moral support and business guidance as these factors will have a significant effect on the performance of the business [35]. The women entrepreneurs in the study use social media tools such as Facebook to network with their friends. They said that it is a convenient tool and easy to use.

Of the women interviewed, 92% of them use Facebook to network and to keep in touch with friends, family members, business associates to update themselves with information. 33% of the women have created two Facebook accounts - one separately in the company's name and another in their personal names. 42% of the women have one account in their personal name and 17% have one account in their company's name.

Only one woman entrepreneur does not think that it is necessary to use social media to network. She prefers to meet and keep in touch with her friends, family and customers via the telephone, email or meet up with them personally.

This study was based on a small sample size and it studied the usage of information technology in computers, website, social media and new technology creation. Future studies can use larger samples with a quantitative approach.

**CONCLUSION**

Singapore women entrepreneurs have a high need for achievement and they have a positive attitude towards technology. For the successful usage and acceptance of technology, it is important to develop positive attitudes towards technology. People feel free in using technology once they are convinced of their usefulness. The ease of use of the technological devices and systems will also encourage people to develop positive attitude towards accepting technology. Therefore, the factors which influenced the usage of technology by the women entrepreneurs were their personal traits and the perceived usefulness of the tools.

More women entrepreneurs will start using ICT if they are aware of its advantages and usefulness. Easy access to training facilities on how to use these tools will motivate more women to use them and this will in turn increase productivity.

**Appendix 1**

**Interview Transcripts**

11. "I am a creative person and I design the decoration items myself. I then take them to the suppliers and get them to make the items according to my specifications".

12. "I use the personal computer to do my administrative work. I have created a Facebook account in my company's name to promote my company's products and to inform my friends of any product promotions and sales".

13. "I joined my family business - securities. I am the eldest of two children. I wanted to join the police force but my father wanted me to join his business. My father has passed away. It has been very challenging for me because my employees are mainly men and they are older than me".

"I am an innovative person and I believe it is important to upgrade oneself. Since taking over the business, I have incorporated new technology such as security systems in the company. I created flyers about my company and went door-to-door to promote my company. I have set up a training company and train my employees".

"I have created a company website on the internet for all users to know about my company and our service".
"I maintain a my personal Facebook account to network and keep in touch with my friends".

14. "I am a creative person and I enjoy designing and printing. I do digital printing - high ending printing, offset printing, magazines".

"I have created a website in my company's name on the internet to promote my company's services and products". "I maintain two Facebook accounts - one in my company's name and one in my name".

15. "I believe that one should continuously look out for new opportunities to grow the business. I have two beauty lines - one for women and one for men. I am constantly looking for products to enhance my business. My company continues to grow - I have several branches in Singapore and have also established branches overseas."

"Recently, I have created the Card System. My customers can top up value in the card (similar to the Transit Link card that we use for transport). After they complete their beauty treatment, the counter staff will just to tap and the amount will be deducted from their card. This promotes cashless transactions and is convenient for the customer and efficient for the company".

"I have created a company website on the internet. I have two Facebook accounts - one in my company name and one in my name".

16. "I wanted to be a teacher but my father wanted me to join his business which is in retail. We import mutton from overseas and we are one of the largest in the market".

"I created the Mini-Mart after entering the business because I saw the opportunity to increase the business. So, now the company sells to suppliers as well as to walk-in customers".

"I computerised the company's business - billing, purchasing and accounts. This makes work faster, neater and efficient. I have created a company website on the internet. I have a personal Facebook account because I enjoy networking with my friends and family".

17. "I want to be a Change Maker. I am a creative person. I saw the opportunity in 'plus size' market - this is a niche market".

"I have created the first Plus Size E-Magazine in Asia. It is a lifestyle magazine and helps boost the morale of plus size women".

I have created a company website on the internet. I have two Facebook accounts - one in the name of the company and one in my personal name".

18. "I was a teacher and am now in the Spa and Wellness business. I have set up systems in the business and have integrated the various departments".

"I look for new systems and equipment that will enhance work and increase productivity. I upgrade the products and improve the treatment for my customers".

"I have created a company website on the internet and I have a Facebook account in my company's name."

C9. "I enjoy my work tremendously - it is full of challenges - in unchartered waters!"

"I want to save the environment and make the world a better place to live in. One of my companies produces energy-saving lights and I am promoting that to save energy and fuel".

"I have created a company website on the internet so that customers can know about my company and its activities".

"I have a personal Facebook account"

C10. "Very IT savvy. I know about e-business/e-commerce. Maintain a virtual office. Most of the business done on computer. I am in this line because I believe education and training is very important for the growth and development of individuals and the country".

"I have a company website on the internet"

"I have a personal Facebook so that I can network with my friends and business associates"

C11. "I only have secondary school education. But I am a creative person and I love to design clothes. I design the patterns and I get my suppliers to sew them for me. Most are from overseas".

"I use my personal computer to communicate with my suppliers who are overseas. Sometimes, I skype with them, sometimes I email them".

"I use my computer for administrative tasks such as billing, inventory control and accounts"

"No need for Facebook or website. I telephone and network with my friends and meet up with them"

M12. "I am a franchisee - I have bought a system which has worked well"

"I use the computer a lot because most of the business involves communicating with the people."

"I have a website for the company because I want people to know about the business."

"I have a personal Facebook account to network with my friends and family".
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