An empirical study of website adoption among Small and Medium Enterprises (SMEs) in Malaysia

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Abstract

In Malaysia, SMEs operate in almost every major industry from manufacturing to manufacturing-related services to agriculture and the services sectors**.** This study examines the gap between the importance perception and implementation of Web Presence as a critical success factor among small and medium enterprises (SMEs) in Malaysia. Data was obtained from 158 entrepreneurs involved in the Malaysian SMEs. Interviews were also carried out with five SMEs to supplement the statistical findings. Paired t-test results revealed significant differences between web site adoption patterns between SMEs in the manufacturing and the service sector. The findings offer useful insights on how a web presence can contribute towards value creation for SMEs.

Keywords: Website adoption; Internet adoption, SMEs; Success factor, manufacturing, service

Introduction

A web site that supports multiple functions – one that is utilized as a platform for communications within the organization as well as between the organization and its external stakeholders, which also serves as a platform for operating internet-based applications, can be useful to virtually any business. At the very least, a company can use a web site to publish its corporate brochures in cyberspace. A web site may also function to facilitate communications, both among the personnel within a company and between the company's personnel and its external stakeholders. Further, if a web site is made into a platform for e-commerce technology, its interface ultimately can enable virtually any type of ordering by a customer, as well as facilitating other parts of the shopping, selecting, and purchasing process.

All over the world, the role of entrepreneurship and SMEs for economic development, welfare and wellbeing are emphasized more than ever (Donckels & Miettinen, 1997). The importance of Small and Medium Enterprises (SMEs) to the national and local economy is extensively documented as providers of employment as well as products and services. In many countries, small enterprises, and even the medium ones have been found to be major sources of employment, revenue generation, innovation and technological advancement (Kotey &Meredith, 1997).

Several authors have identified various factors which could affect the adoption or non-adoption of websites and e-commerce within export oriented SMEs (see Houghton et al., 2001), while others have highlighted the potential effect of website and e-commerce adoption on channel relationships (e.g. Jevons and Gabbott, 2000; Webb, 2002). For example, Webb (2002) and Kumar (1999) propose that conflicts can occur when resellers have not been considered in e-commerce plans. Channel relationships were also claimed to be affected where intermediaries can be cut out of channels or compete with e-commerce, in a process known as disintermediation (e.g. Jevons and Gabbott, 2000). Frazier (1999) even suggests that manufacturers using a highly selective distribution channel in which the dependence and investment in intermediaries is high, should avoid the use of the Internet for e-commerce, and focus upon providing websites with information on distributor and agent

contact details.

SMEs in the less develop countries face technology constraints, and this is one of the shortcomings which is one of the important means to garner competitive advantage to strive in the marketplace. The emergence of digital subscriber line (DSL) increases the bandwidth of internet and this leads to the increase in surfing speed for the internet user. The competition between the SMEs to achieve higher customer satisfaction is a powerful business objective because satisfaction is an overall indicator of how well customers rate a company.

Despite that, being one of the developing countries, Malaysia is concerned in the developing and participation of SMEs in the internet-based services. The encouragement and subsidies from the local government has helped SMEs to host their own official web sites and gain competitive advantage.

The lack of education and technical skills has also led to the low rate of website adoption by the SMEs. The users and SMEs as well, do not understand the working and the convenience of internet and web sites. Mostly, the traditional companies are less interested in adopting the latest technologies, such as computer skills, and the use of high tech devices, latest robotics, including the adoption of the web site. One of the main reasons for this is their ignorance of the usefulness of the technology in gaining competitive edge in their market place.

The security issues are also one of the serious problems that these SMEs have to deal with. Either consumers or members of the SMEs feel that they might not be secure while performing their transaction over the internet. There are fears associated that while browsing the web site or putting their information or database in the web site, there will be a theft of all these private and confidential information. There are also a lot of security problems that still exist in using web sites, such as information theft, revealing of internal information, hackers, spy ware, and also web spiders.

Traditional business owners and consumers think that they can provide or get more information from the direct interaction with the sales person, compared to just going through the web sites. Consumers are knowledgeable in the consumption and the comparisons of the products or services that they wish to purchase. They might need to gather all the important information before they make their final consumption decision. Internet web sites might be the easiest way to make such comparisons of the product lines of different companies. However, there are limitations since it is impossible for the consumers to get a real feel of the products.

Moreover, local governments are making great efforts to eliminate all these problems. Governments should monitor the daily transactions and web site activities, to reduce “virtual thieves”. ISP should provide the anti-virus systems or firewall to all the internet users especially for those with official web sites, to prevent spy ware and viruses contained in the web site’s files and also the hacker to hack the web server. Users or consumers should make sure that all their personal computers are firewall-enabled to prevent the leaking of important information.

This research thus fills the above gap by empirically examining the influence of Web site adoption success factors identified through the literature on the SMEs. The extent of the implemented success factors by the SMEs will also be identified so that subsequent gaps, if any, can be identified and recommendations can be made so that the Malaysian SMEs could implement their adoption and hence improve their competitiveness.

Literature Review

Wymer and Regan (2005) provide an extensive list of incentives and barriers to the adoption and use of e-business and e-commerce information technology

(EEIT) by small and medium businesses (SMEs). The basic assumption is that EEIT offers new opportunities for SMEs to offset competitive disadvantages of size, resources, geographic isolation, and market reach. The study focuses on the variables that act as barriers (inhibiting adoption and use) and those that act as enablers (promoting adoption and use). Adoption and use of information and communication technologies (ICT) in general were also considered.

Phau and Sui (2000) considered SMEs involved in the food and beverages industry and found that these companies are still not ready to adopt and promote web sites among their employees, customers, and vendors. The reason for this is mainly due to the fact that when they post their products information and dimension as well as ingredients on their web pages they can only appeal to sight and sound out of the five senses. The important aspects of the food and beverages companies is to let their customers feel, smell, and taste the products. This is the weakness of the internet compared to the traditional mode of purchases.

Grover and Goslar (1993) found most of the SMEs today have their own PC embedded with modem, but they have still limited themselves with regards to using their web site as a medium to promote their products and services. Most of these SMEs are just interested to show that their companies are all computerized. Most of the managers lack skills and knowledge on surfing the internet, and some even to log in to the internet. All these managers perceive that learning and adopting the web site is a waste of time and it is one of the costs that may burden their company if they spend money to train their employees.

Kelvin Chin (2006) from Computer Association (CA) claims that the SMEs are concerned more about their appearance in the market rather than getting into new advanced technology with no contribution to their expansion and extension. They are more concerned with mergers and acquisitions that may give more immediate effects Chin also claims that it is a huge problem to get SMEs to commit to the investment of a RM5, 000 to over RM20, 000. Besides that, SMEs might also need to acquire new hardware to support their web site, such as new server computer to support the new web site and also the bandwidth that is needed for visitors and corporate users as well.

To this extent few local associations, such as CA, are agreed with some local vendors, in providing the hardware to SMEs at low costs. Beside this, CA has affiliations with local financial bodies, such as Orix (local finance company) to provide financial schemes to help SMEs in this regards. Rental and leasing are some of the options that SMEs consider for acquiring the equipment necessary to set up their web sites An alternative scheme is the hire purchase. SMEs can purchase their equipment and hardware, as well as set up their official web site on an instalment payment basis. SMEs can also get support and advices in terms of web site maintenance and set up from professionals through the schemes provided by CA. Local government and CA believes that, if they can provide an affordable solution and support with high ROI and short implementing cycle, SMEs will definitely take up the offer.

Local SMEs indicate that the internet is not secure enough and they are not ready to set up their web sites. Since they think the security problems might lead to problems to both their customers and themselves. Feher and Towell (1997) stated that more than 67% of their users of websites are concerned more with the security problems. SMEs are not willing to spend extra money or invest more, to solve problems related to their own web site, such as security problems, bandwidth, gimmicks included in their web pages, and also the consultation fees.

There is a great deal of researches done which has indicated that most of the SMEs are of the opinion

that they are comfortable in doing their business and transaction, as well as communication with their vendors and customers by means of face-to-face interaction, telephone communication, and also facsimile, but not the internet.

Fillis, Johannson and Wagner (2004) focus attention on sets of internal and external factors which impact on smaller e-business usage. The technology advances at a much faster rate offering vast opportunities for international market access. The attitudes, motivations, values and subsequent behaviours of owners and managers influence the implementation of websites. The major benefit of adopting website in SMEs is the ability to access information infrastructure. This heightens the need for SMEs to communicate internally and externally with customers, suppliers, business partner and competitors. The internet offers new business opportunities but it also has its own share of threats and barriers to entry. Developing an e-commerce platform is an essential for competitive advantage.

Based on the foregoing discussion, the objectives of this paper are to:

a. To examine the perceptions of the importance of web adoption among the Malaysian entrepreneurs
b. To identify factors that influence web site adoption by SMEs
c. To analyze whether there is any significant differences between perceived external pressure and intention to adopt website. With respect to companies with websites (i.e., adopters)

The survey research methodology is adopted for this study to evaluate the web presence among small and medium companies in Malaysia. The analysis and findings presented in this study are mostly derived from a survey of the entrepreneurs in Small and Medium Enterprises.

Methodology

The sampling frame for this study was obtained from companies listed in the SMIDEC's website (http://www.smidec.com.my/). The companies considered in this study conform to the SME definition specified by the National SME Development Council which applies across economic sectors, for adoption by all Government Ministries and Agencies involved in SME development, as well as financial institutions. The table below summarizes the approved SME definitions based on number of full-time employees:

Sector / Size	Primary Agriculture	Manufacturing (including Agro-Based) & MRS	Services Sector (including ICT)
Micro	Less than RM200,000	Less than RM250,000	Less than RM200,000
Small	Between RM200,000 & less than RM1 million	Between RM250,000 & less than RM10 million	Between RM200,000 & less than RM1 million
Medium	Between RM1 million & RM5 million	Between RM10 million & RM25 million	Between RM1 million & RM5 million

The targeted respondents who are the owners (entrepreneurs) were contacted and the nature of the study was explained to them. As such, the owners and or key managers were targeted because they owned or oversee the operations of their respective organizations. A visit was then made to the companies included in the sample to distribute the questionnaires to the owners/key managers.

Out of 350 questionnaires which were sent to the targeted respondents about 158 usable responses were collected. The targeted response rate of 45% percent is considered reasonably high and resulting

in a representative sample of the population being studied. The high response rate is due to the "personal contact" approach used. The researcher personally contacted all the owners or key managers of the companies and convinced them about the need and benefits of the study. A series of follow-ups were also made.

A study is considered to be rigorous when it uses more than one data collection methods (Sekaran, 2003). For that purpose, interviews were conducted with five randomly chosen SMEs. The purpose of the interviews is to supplement the statistical findings and also to help illuminate the nuances of the issues discussed. Since this study aims also to explore the respondents' current state of web implementation, it is believed that the additional information from the interviews would provide the actual reasons for certain adopters and non-adopters in the organizations concerned. It is felt that with the good response rate coupled with the additional information from the five companies interviewed, are adequate to offer useful insights at least at the exploratory level with reasonable reliability and generality of the findings.

Questionnaire design

This study was carried out using a set of questionnaire. A questionnaire-based survey would allow the exploration of a significant number of issues (Choi, 2000). In line with the objectives of this research, the questionnaire used in this study contains six sections. Section 1 consists of questions capturing the companies' demographic information, such as types of ownership, years of operation, whether the organizations have made significant investment in website development. Section 2 evaluated the purpose of internet usage by the owner/key managers. Section 3 and 4 focus on the perceived importance and implementation of web site adoption respectively. Section 5 elicits the main barriers and benefits of web site adoption. The final section of the questionnaire is tailored for the SMEs which had already adopted and implemented web sites. The questions require the respondents to indicate the value according to the Likert-scale standard; 1 (strongly disagree), 2 (disagree), 3(not certain), 4 (agree), and 5(strongly agree). However, some respondents tend to choose the middle option which is not certain. On the other hand, some respondents had not attempted to answer some of the questions. So, while coding the responses in SPSS, the number zero '0' is used for those unanswered questions, to indicate that the respondents were ignoring those questions which were probably not applicable to them.

Discussions and Results

Table 1 shows the Cronbach's alpha for the seven constructs are above 0.7 except for first construct which was marginal below 0.7. This indicates that overall the theoretical constructs are reliable with adequate construct validity.

Sample Characteristics

As can be seen from Table 2, 74.10% are males and 25.90% are females, not an absolutely equitable distribution. The respondents age are of 21 to 30 years (30.40%), 31 to 40 years (20.30%), 41 to 50 (32.30%) and rest is 17.1% thus indicating that the entrepreneurs are fairly young with a small group of seniors. A large proportion of the entrepreneurs are Chinese 81.60%, Malays account for 12.70% and 5.70% are Indians. Furthermore, the data in the table below indicates that about 40.5% are secondary school leavers, 24.10% are STPM, Diploma or A-level holders, and 32.30% of them are at least a degree holder. In addition 13.90% o the respondents are at the supervisory level, 19.00% are at the managerial level, 15.80% are executive officers, 12.00% are clerical or non executive staff, and the remaining 39.20% are, designers etc.

Table 3 shows that 28.50% are the manufacturing companies and the rest of 71.50% are the services companies.

As shown in Table 4 the sample companies are from the manufacturing sector (19.60 percent),

construction sector (7.60 percent), utility sector (5.10 percent), business services sector (17.70 percent); transportation, storage and communication sector (8.20 percent), hotel, restaurant and tourism services sector (10.10 percent), education and training services sector (5.10 percent), wholesale, retail, import and export sector (13.30 percent). The remaining of 13.30% consists of interior design companies, religion related services, and production companies, which fall under the "others" categories.

Table 5 shows that 20.30% have been in operation from 1 to 5 years, 24.10% have been in operation from 6 to 10 years. The remaining 55.7% of the sample companies have been in operation for more than 10.

Table 6 shows that 79.70% of the respondents' companies have less than 50 employees; 10.10% of the respondents companies have between 51 to 100 employees and another 10.10% of the sample firms had between 101 to 150 employees.

Table 7 shows that 95.60% of the respondent companies annual turnover was below RM10 million with the remaining 4.40% above RM10 million.

Table 8 shows that 41.80% of the companies use their personal savings fund, 14.60% from family savings, 33.50% of the companies' use loans from financial institutions. 1.90% obtained their funds from venture capital and by leasing their properties respectively. The remaining 6.30% obtained financial assistance from other source, which includes investment from other companies or borrowings from friends etc.

Table 9 shows that 46.80% of them are currently using Internet based system to support their business while the remaining of 53.20% still do not use Internet based system for their business activities.

Table 10 shows that 16.20% of the companies have adopted Internet based systems for only less than a year; 18.90% of the companies adopted Internet based systems about 1 to 2 years ago; while companies who adopted Internet based systems to support their business activities from 3 to 4 years are the highest, which account for 43.20% from the 74 companies. The remaining 21.60% fall in the companies which adopted Internet based systems about 5 to 6 years ago.

Table 11 indicates that the greatest barrier to web site adoption is the security issues followed by lack of Technical and IT personnel, high start up cost, low ROI, and inadequate knowledge in that order.

Table 12 shows the average factor means and the associated rankings to the benefits of the web site adoption. The advantages or benefits are quite clear from the rankings in the table below.

_t_-Test

Using Independent sample *t*-test analysis, Table 13 illustrates the differences between two groups. For the purpose of comparing the two, the manufacturing and service adoption sector were combined. The *t*-Test is carried out to identify the differences in perception on web site adoption between manufacturing and service companies. The *t*-value acquired for manufacturing companies and service companies is -3.19, significant at the 5% level. It indicates that there is a significant difference between the manufacturing and service sector with the service sector importance perceptions exceeding that of the manufacturing sector.

Linear Regression

The impact of the six independent variables on the dependent variable namely web site adoption was evaluated by using the multiple linear regression technique. The results show that the six variable account for 19.6% of the variation in the Malaysian SMEs web site adoption.

Table 15 shows that the F=7.36 which indicates that the regression model is significant at the 5% level.

The results in table 16 indicates that compatibility of company website, observability and security and Confidentiality are the significant factors which drive the intention to adopt web site adoption

Conclusion

This study has addressed the current state of web implementation in Malaysian organizations, particularly the SME companies. This study has provided an opportunity for the SMEs companies to undergo a self-check for the various areas indicated in the study and recommends actions on how the gaps can best be minimized. It is hoped that this study has aided the Malaysian SME companies to better understand the prerequisite necessary to succeed in their businesses, especially in today's competitive environment.

In addition, it is also hoped that the study on the manufacturing and service industry companies can provide a benchmark for the companies in other industries that wish to establish a website. As Drucker (1999) puts it, there is no industry or company that has a natural advantage or disadvantage; the only advantage it can possess is the ability to exploit universally available knowledge. It is recommended that future studies should include a bigger sample size and data should be collected from various industries to ensure that the results can be generalized. A comparison between the MNC and SME companies in Malaysia is also a possible area for future research to ensure generalisability of the results. Finally, due to the financial and time constraint, the data are only gathered in Malaysia.

Table 1: Reliability Test Results

Constructs	Chronbach Alpha
Leveraging company through Website	0.623
Compatibility of Company Website	0.830
Internet Technology	0.717
Trialibility	0.817
Observability	0.612
Security and Confidentiality	0.920
Intention to adopt web sites	0.974

Table 2: Respondents' Characteristics

Item	Description	Frequency (*f*)	Percentage (%)
Gender	Male	117	74.10
	Female	41	25.90
Age	Below 21 years	2	1.30
	21 ~ 30 years	48	30.40
	31 ~ 40 years	32	20.30
	41 ~ 50 years	51	32.30
	Above 50 years	25	15.80
Race	Chinese	129	81.60
	Malay	20	12.70
	Indian	9	5.70
Educational Level	Secondary School	64	40.50

	STPM, Diploma or A Level	38	24.10
	Degree	51	32.30
	Master/PhD/Post Graduate	0	0.00
	Professional	0	0.00
	Other	5	3.20
Position hold in company	Supervisor level	22	13.90
	Manager level	30	19.00
	Executive officer	25	15.80
	Clerical/non-executive	19	12.00
	Other	62	39.20

Table 3: Primary Activity

Primary Activity	Frequency (*f*)	Percentage (%)
Manufacturing	45	28.50
Service	113	71.50

Table 4: Type of Organizations

Type of Organization	Frequency (*f*)	Percentage (%)
Manufacturing	31	19.60
Construction	12	7.60
Utility	8	5.10
Business services	28	17.70
Transport, storage and communication	13	8.20
Hotel, restaurant, and tourism	16	10.10
Education and training	8	5.10
Wholesale, retail, import or export	21	13.30
Others	21	13.30

Table 5: Years in Operation

Years in Operation	Frequency (*f*)	Percentage (%)
Less than a year	0	0.00
1 ~ 5 years	32	20.30
6 ~ 10 years	38	24.10
Above 10 years	88	55.70

Table 6: Total Number of Employees

Number of employees	Frequency (*f*)	Percentage (%)
Below 50 employees	126	79.70
51 ~ 100 employees	16	10.10
101 ~ 150 employees	16	10.10

Table 7: Annual Turnover

Annual Turnover (RM)	Frequency (*f*)	Percentage (%)
Below 10 million	151	95.60
Above 10 million	7	4.40

Table 8: Major Source of Fund

Source	Frequency (*f*)	Percentage (%)
Personal saving	66	41.80
Family saving	23	14.60
Loan	53	33.50
Venture capital	3	1.90
Leasing	3	1.90
Others	10	6.30

Table 9: Assessment of Internet Usage

Internet usage	Frequency (*f*)	Percentage (%)
Yes	74	46.80
No	84	53.20

Table 10: Internet Based Support Systems

Years of adopting Internet Based Systems	Frequency (*f*)	Percentage (%)
Less than a year	12	16.20
1 ~ 2 years	14	18.90
3 ~ 4 years	32	43.20
5 ~ 6 years	16	21.60
6 ~ 7 years	0	0.00

Above 7 years	0	0.00

Table 11: **Barriers of Web Site Adoption**

Barriers of web site adoption	Means	Ranking
Lack of technical	4.10	2
Lack of IT personnel	3.99	3
Inadequate knowledge	3.18	7
Security	4.25	1
Costs justification	3.87	6
High start up costs	3.94	4
Measurement of ROI	3.88	5

Table 12: **Benefits of Web Site Adoption**

Benefits of web site adoption	Means	Ranking
Successful of local market	4.13	1
Ability to reach global	3.48	6
Effective advertising and brand building	3.95	2
Ability to compete with large companies	3.15	9
Ability to compete with SMEs	3.92	4
Released from normal operating hours	3.93	3
Improve customer service	3.86	5
Costs saving	3.09	10
Access to external information	3.46	7
Ease of recruit	2.93	11
Knowledge sharing	3.23	8

Table 13: The Differences of Web Site Adoption between Industries

Sector	N	Mean	Standard Deviation	*t*-Value	Significant Level (2 tailed)
Manufacturing	44	2.77	1.41	-3.19	0.02
Service	114	3.55	1.35		

Table 14: Independent Variables on Web Site Adoption

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	0.476	0.226	0.196	1.26

Table 15: ANOVA Output for Multiple Linear Regressions

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1764.439	6	294.073	7.360	.000(a)
	Residual	6033.105	151	39.954		
	Total	7797.544	157			

Table 16: Regression Output

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.504	5.597		5.450	.000
	V1	-.336	.333	-.080	-1.012	.313
	V2	-.659	.241	-.244	-2.739	.007
	V3	.084	.309	.020	.271	.787
	V4	-.194	.175	-.087	-1.109	.269
	V5	-.889	.357	-.214	-2.491	.014
	V6	.405	.201	.157	2.013	.046

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