



WEBSITE ADOPTION: OVERVIEW OF MALAYSIAN COST ENGINEERING FIRMS

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ABSTRACT

Purpose: Website is a powerful tool in business today and its advantages have been well established in the research field of e-commerce, IT, ICT and SME. In construction-related professional sector, website could be a platform for greener, effective communication and collaboration among team members as well as a tool for marketing. However, the current scenario of website adoption in construction professional is unknown due to the lack of research. Therefore, this paper is intended to provide an overview of website adoption in Malaysian cost engineering firms in terms of adoption rate, the profiles of adopters and non-adopters, determinants and inhibitions of the adoption.

Design/Methodology/Approach: 319 sets of questionnaire had been posted to all cost engineering firms throughout Malaysia, and then complemented by online survey. 58 firms out of 319 firms responded to the survey resulting in 18.1% response rate.

Findings: Website adoption rate in Malaysian cost engineering firms is 27.6%, 11.9% are developing own website and 69.0% plan to develop own website. Majority of the adopters are matured firms with more employees and higher average commission, compared to non-adopters. Meanwhile, adopters' projects predominantly from private and public sectors and mostly involved with overseas project. Furthermore, firm size, average commission and involvement with overseas project influenced the propensity to adopt this initiative. Finally, the slowness of adoption is associated with perceived 'not lead to more efficiency or lower cost', 'not lead to more commission' and 'lack of time'.

Research Limitations/ Implications: Low response rate jeopardised the credibility of the findings. However, it could be useful to indicate the current website adoption scenario in Malaysian cost engineering firms.

Practical Implications: Website could be utilised to help in firms' growth. The adoption could be a kick-start to grow and expand beyond local boundaries.

Originality/ Value: The scarcity of information regarding the adoption of website among construction-related professionals indicates that only few research have been done in this area.

Keywords: Website adoption, cost engineering firm, profile, determinants, inhibitions

Classification: Research Paper



INTRODUCTION

Website could be more than just a shop window for a construction business and holds great entrepreneurial opportunities such as powerful branding and sustainable stakeholders' loyalty if designed and managed effectively (Preece et al., 2001). The advancement in web-based technologies enable website to be integrated with other software, hence expanding its purposes as communication and collaboration platform among project team members and reduce the impact of fragmentation in this industry. The scarcity of literature pertaining website adoption in construction related areas indicates that this area is not receiving sufficient attention from academicians in this field. Due to this constraint, most of the website adoption literatures have been derived from technology adoption such as IT, ICT and e-commerce among SMEs.

LITERATURE REVIEW

Benefits of Website

The precondition for success in today's business world is the use of internet technologies and aligned it with its organisational goals (Porter, 2001). Internet technologies have intrinsic characteristics that bring tremendous changes in conducting business; potentials to reduce costs of coordination, communication and information processing as well as able to reach a large number of potential clients (Tsikriktsis et al., 2004). Website is one of internet technologies and its adoption, especially in small businesses, takes the internet adoption to a higher level, regardless of the levels of website sophistication and its relevance to target customers (Simmons et al., 2008). Besides, adoption of e-business via website now is a low-price technology accessible to firms of any size, enabling smaller firms to be at par with their larger counterparts (Cerdan and Acosta, 2005).

Construction project is highly dependent on efficient communication, collaboration and successful competence integration (Gustavsson et al., 2012). The utilisation of web technologies promotes coordination and collaboration among team members of a project (Redmond et al., 2012). It enables faster and more effective information transfer, hence offer unique opportunities for teamwork and workflow automation across the organisations boundaries. Furthermore, the adoption could lead to better communication and financial control, increase the quality and timeliness of documentation, speed of works, simpler and faster access to common data and decrease in documentation errors. Apart from that, website could also be utilised as a tool to create a powerful brand and as a marketing tool (Preece et al. 2001; Preece and Suhaimi, 2009) because a strong online presence could enhance business performance (Cerdan and Acosta, 2005; Goi, 2012) as well as it contributes to overall growth of firms (Teo, 2005). Website adoption indicates strategic commitment to e-commerce and these initiatives improve firms' competitiveness (Teo and Pian, 2004).

Characteristics of Website Adopters

Firm size is the most likely drivers of e-commerce commitment, hence translated into website development (Kowtha and Choon, 2001; Simmons et al., 2009). Larger firms favour early entry because more often than not, they enjoy quicker access to capital and skills as well as they have some built-in capabilities. Teo and Pian (2004) supported this finding as

they too found that firm size has been substantially influenced the adoption of website as a strategic commitment to e-commerce.

Internet technologies such as website hold great promise in facilitating the internationalisation of small, knowledge-intensive firms (Prashantam and Young, 2004). It enables firms with limited resources to significantly reduce cost in communication because physical present is no longer necessary for effective communication with clients globally. Besides, website is effective for marketing and information sharing, both locally and beyond (Abari, 2011).

Barriers to Website Adoption

According to Walczuch et al. (2000), small firms were not adopting the internet with the same speed of the larger firms, although it could offer many advantages to them. Small businesses perceived that the website would not lead to more efficiency or lower cost and not suitable for a particular business because they failed to see the direct benefits out of this initiative, therefore reluctant to invest time and money in an internet presence. In a developing country of Oman, Alkalbani et al. (2012) found that lack of IT competent personnel, reluctance to change, security issues and financial constraints are the main barriers to adopt ICT in construction industry. Meanwhile, in Australian construction industry, limited resources in SMEs, lack of perceived return on investment on IT expenditure and lack of strategic planning are the organisational barriers for IT deployment (Stewart et al., 2004).

METHODOLOGY

Postal and online survey had been utilised to gather data in this research. The sampling frame was obtained from the website of the government body that governed the cost engineering practices in Malaysia. Questionnaires were sent to all 319 firms by postal. In effort to increase response rate, self-addressed envelope was enclosed in the postal survey and invitation to answer the survey online was sent to the respondents' e-mail. Respondents could choose to return the answered questionnaire either by post, online or 'scan and e-mail'. Despite of the convenience to send the answered survey, two reminders were sent by postal and online within four months of data gathering period. This research suffers a low response. Only 58 out of 319 questionnaires were returned, resulting in 18.1% response rate.

FINDINGS

Demographic

Table 1 shows the details of the participating firms. Majority of the respondents are non-adopters (72.4%) and 72.4% of the survey were answered by the top management personnel in their respective firm. In terms of firm category, 50% of the responses came from sole proprietorship firms.

Table 1: Respondents' Profile

Website Adoption	Adopter	27.6% (16)
	Non-Adopter	72.4% (42)
	TOTAL	100% (58)
Position	Top Management	72.4% (42)
	Manager	6.9% (4)
	Cost Engineer	20.7% (12)
	TOTAL	100% (58)
Firm Category	Sole Proprietorship	50.0% (29)
	Body Corporate	24.1% (14)
	Partnership	22.5% (13)
	Multi-Disciplinary	3.4% (2)
	TOTAL	100% (58)

Table 2 shows the intention of developing a website in the future among the website non-adopters. Majority (69.0%) would like to develop a website but still uncertain of the time while 11.9% are in the process of developing own website. However, 19.0% do not have the intention to develop a website for their firms.

Table 2: Intention of Developing Firms' Website in the Future

	Frequency	Valid Cases
Maybe, but uncertain of the time	29	69.0%
No intention of developing a website	8	19.0%
In the process of developing own website	5	11.9%
Total	42	100.0%
Missing Cases	16	
Total	58	

Characteristics of Adopter and Non-Adopter

Table 3 shows the details of adopter and non-adopter characteristics in five criteria namely firm age, firm size, average commission, source of project and involvement with overseas project. The mean value of firm age for adopters is 23 years while for non-adopters is 15 years. In terms of firm size, the average number of employee employed by adopters is 48 persons compared to 10 persons by non-adopters. Meanwhile, there is a huge difference in terms of average commission between adopters and non-adopters; RM19.5 million and RM4.1 million respectively. Apart from that, majority of adopters' source of project is from public and private sectors but majority of non-adopters' source of project is predominantly from public sector. Obviously, majority of adopters have been involved with overseas project and majority of non-adopters have never been involved with overseas project.

Table 3: Profile of Website Adopter and Non-Adopter

CHARACTERISTIC		Adopter	Non-Adopter	Mean / Mode
FIRM AGE	Less than 5 years	12.5% (2)	26.2% (11)	Mean Adopter: 23 years Non-Adopter: 15 years
	5 years and above	87.5%(14)	73.8%(31)	
TOTAL		100.0% (16)	100.0% (42)	
FIRM SIZE	Small (1-10 persons)	25.0% (4)	66.7% (28)	Mean Adopter: 48 persons Non Adopter: 10 persons
	Medium (11-30 persons)	50.0% (8)	31.0%(13)	
	Large (> 30 persons)	25.0% (4)	2.4% (1)	
TOTAL		100.0% (16)	100.0% (42)	
AVERAGE COMMISSION	< RM200,000	0.0% (0)	20.0% (6)	Mean Adopter: RM19.5 million Non-Adopter: RM4.1 million
	RM200,001- RM500,000	10.0% (1)	23.4% (7)	
	RM500,001- RM1,000,000	30.0% (3)	43.3%(13)	
	RM1,000,001- RM5,000,000	30.0% (3)	10.0% (3)	
	>RM5,000,000	30.0% (3)	3.3% (1)	
	TOTAL	100.0% (10)	100.0% (30)	
Classified information		37.5% (6)	28.6% (12)	
SOURCE OF PROJECT	All / Majority projects are from public sector	37.5% (6)	38.1%(16)	Mode Adopter: Public & Private Non-Adopter: Public
	Equal portion of projects are from public & private sectors	25.0% (4)	26.2% (11)	
	All / Majority of projects are from private sector	37.5% (6)	35.7% (15)	
TOTAL		100.0% (16)	100.0% (42)	
CHARACTERISTIC	Adopter	Non-Adopter	Mean / Mode	CHARACTERISTIC
INVOLVEMENT WITH OVERSEAS PROJECT	Yes	68.8%(11)	21.4% (9)	Mode Adopter: Yes Non-Adopter: No
	No	31.3% (5)	78.6%(33)	
TOTAL		100.0% (16)	100.0% (42)	

Determinants of Website Adoption

Table 4 shows the results of the statistic tests to determine the significant difference and correlation strength between the five criteria and website adoption. The results show that firm size, average commission and involvement with overseas project have significant difference on website adoption. Then, correlation tests indicate that there are medium strength correlations between these three criteria and website adoption respectively. On the other hand, firm age and source of project do not have significant differences on website adoption, therefore are not tested for correlation.

Table 4: Determinants of Website Adoption

Variables	Significant Difference	Correlation Strength
Firm Age	Z= -1.108, p>0.05 (Not significant)	-
Firm Size	Z=-3.183, p<0.05** (Significant)	r(58) = -0.422*, p<0.05; r ² = 0.178 (Medium strength)
Average Commission	Z= -2.879, p<0.05** (Significant)	r (40) = -0.464**, p<0.05; r ² =0.215 (Medium strength)
Source of Project	$\chi^2(2, N=58) = 0.018, p>$ 0.05 (Not significant)	-
Involvement With Overseas Project	$\chi^2(1, N=58) = 11.484,$ p<0.05** (Significant)	r(58) = -0.445*, p<0.05; r ² =0.198 (Medium strength)

Inhibition Factors on Website Adoption

Table 5 shows the ranking of inhibition factors on website adoption. ‘Not lead to more efficiency or lower cost’, ‘not lead to more commission’ and ‘lack of time’ are the top three factors in rank, followed by ‘sceptical on cost vs ROI’, ‘have other priorities’ and ‘lack of IT expertise’. Meanwhile, factors namely ‘afraid of organisational change’, clients not using the internet’ and ‘unaware of internet marketing practices’ are the bottom three in the rank.

Table 5: Inhibition Factors on Website Adoption

Inhibition Factors	Mean (Standard Deviation)	Rank
Not lead to more efficiency or lower cost	3.57 (0.63)	1
Not lead to more commission	3.55 (0.63)	2
Lack of time	3.48 (0.86)	3
Skeptical on cost vs ROI	3.48 (0.83)	4
Have other priorities	3.40 (0.73)	5
Lack of IT expertise	3.33 (0.93)	6
Doubtful regarding e-transaction	3.31 (0.95)	7

Inhibition Factors	Mean (Standard Deviation)	Rank
security		
Troublesome to have website and to maintain it	3.31 (0.92)	8
Doubtful regarding the security of personal / confidential information	3.31 (0.87)	9
High maintenance cost	3.29 (0.77)	10
Not suitable due to nature of business	3.26 (0.89)	11
Unclear regarding cyber law	3.19 (0.83)	12
High initial cost	3.12 (0.83)	13
Sufficient number of clients	2.98 (0.87)	14
Technically too complicated	2.79 (0.87)	15
Never thought of having a website	2.76 (0.91)	16
Sceptical of technology change	2.74 (0.91)	17
Afraid of organisational change	2.48 (0.86)	18
Clients not using the internet	2.43 (0.97)	19
Unaware of internet marketing practices	2.19 (0.89)	20

DISCUSSION

The Rate of Website Adoption

The rate of website adoption among Malaysian cost engineering firms is 27.6%. This percentage shows an encouraging increment where in 2002, the adoption rate in Malaysian construction industry at large was 24% (Mui et al., 2002) and in 2007, the adoption rate among Malaysian quantity surveying firms was 19.2% (Abdullah and Haron, 2007). Furthermore, Alam and Ahsan (2007) argued that the website adoption rate among Malaysian SME service firms was at 9.4% in 2007. Eventhough the pace of adoption is relatively slow among cost engineering firms, this pattern is consistent with Alam and Ahsan (2007) statement that the Malaysian SMEs are slow in adopting a website for businesses. In comparison, website adoption in architectural practices in Western Cape has been increasing from 17.5% in 2000 to 42.6% in 2012 (Grosskurth et al., 2012). Meanwhile, the e-commerce adopters in Singapore have been reached 52.8% in 2004 (Teo and Ranganathan, 2004). In Netherland, Walczuch et al. (2000) stated that 21% of Dutch small firms have had a website and this figure would be increasing as the upgrading of internet access was in progress.

The percentage of website adoption in Malaysian cost engineering firms would likely to increase in the future as almost 12% of the non-adopters are in the process of developing a website for their firms and almost 70% expressed the intention to develop a website for their businesses. These figures indicate that awareness on opportunities offered by website among the practices have been increased almost four folds in 10 years duration as Mui et al. (2002) found out that, in 2002, only 21% of the construction-related firms in Malaysia had the planning to develop a website for their firms in the future.

Fierce competition in the construction service sector due to liberalisation and globalisation could have been the push factors to encourage the practitioners to rethink their strategies to be competitive and more visible in the ever dense market. Construction-related-service market is not only flooded with new entries from local fellows but also receive entrance from highly competitive companies from overseas (Abidin et al., 2011). Website is a multi-purpose tool that enable small firms to be at par with their larger counterparts (Walczuch et al., 2000); a showcase of firm image and reputation (Xi et al., 2007), could be integrated with other applications and serves as a project collaboration platform (Redmond et al., 2012), as well as an effective medium for communication (Yong et al., 2012). Somehow, by having a website, the firms convey message to the potential clients that they are technology savvy and up-to-date with the current trend in doing business (Armstrong and Durkin, 2008; Kowtha and Choon, 2001).

The Profile of Website Adopters and Non-Adopters

In order to understand the website adoption trend among the Malaysian cost engineering firms, preliminarily, it is useful to comprehend the adopters and non-adopters profiles. In this research, data regarding firm age, firm size, average commission, source of project and involvement with overseas project are selected to depict the profiles.

The result shows that the adopter firms have been existed longer in practice, they have a larger pool of resources in terms of manpower and financial, their source of projects is predominantly from both sources; public sector and private sector and majority have been involved with overseas project (see Table 3). In comparison, the non-adopter firms are younger firms with smaller pool of staff and financial resources, more dependent on public projects and majority have never been involved with overseas project. In terms of firm age, this finding is consistent with Hoskinsson et al. (2008) that found more established firms are more effective in exploiting the identified opportunities while younger firms are more effective in identifying opportunities and producing radical innovations. Furthermore, by reckoning the entrepreneurial opportunities offered by the website, the larger firms could have more capabilities and resources to utilise the website for the benefits of their firms. This finding is consistent with Teo et al. (2009) findings that firms with larger pool of staff and higher annual revenue are associated with the adoption of e-procurement. The advantages in resources especially manpower and financial enable larger firms to allocate more skills and higher budget on their IT initiatives to ensure its effectiveness. Besides, they have a greater need to keep ahead in technologies advances to remain competitive compared to the smaller firms.

The source of project among adopter firms is predominantly from both sectors namely public and private, meanwhile the non-adopter firms are more dependent on public projects. References on this matter cannot be found and it is a new variable tested in this research. Nevertheless, a plausible reason could be that the adopter firms are more visible in the market and their experiences and reputation are displayed on the website for reference. Potential clients from private sector could have easily accessing the firms' information via the website and contact the firm for further actions. Apart from that, majority of adopter firms have been involved with overseas project compared to non-adopters firms and this indicates that having a website could be a strategic move for expanding beyond local boundaries. Since an excellent track record is the most important factor relative to internationalisation (Gunham

and Arditi, 2005), website is an effective tool to canvass the firms' track record as well as firms' image and reputation globally. This advantage could have been fully utilised by the adopter firms to market their service and project their firms' image, hence increase the chances to be shortlisted by clients in other countries.

The Determinants of Website Adoption

Statistic results show that, out of five determinant variables tested, three variables positive for significant differences namely firm size, average commission and involvement with overseas project, while firm age and source of project are not significant (See Table 4). The significant variables also tested for correlation strength and each has medium strength correlation with the adoption of website initiative.

The propensity to adopt a website is associated with large firms, indicated by the number of employees and internationalisation move. This finding is consistent with other research in most ICT and IT adoption and internationalisation of service firms (Aziz et al., 2012; Hadaya and Pellerin, 2010; Teo et al., 2009). In order to grow and expand overseas, website could have been an important tool, initially for marketing and reputation exposure, then as a communication platform and collaboration stage for all team members in a project. Furthermore, the adoption of website is also associated with higher average commission. Possibly, website could be the kick-start in firm growth; easily spotted via search engine, convincing reputation displayed on the website and easily contacted via email or by telephone.

Inhibition Factors on Website Adoption

As mentioned above, Malaysian cost engineering consultant is slow in adopting website. Almost 70% of non-adopter firms have the intention to develop a website for business and this indicates that Malaysian cost engineering firms recognised the entrepreneurial opportunities offered by website. Nevertheless, the current overall non-adoption rate is still more than 70%.

The adoption of website among cost engineering firms in Malaysia have been hindered by the perception that website will not lead to more efficiency, lower cost or more commission. Besides, "lack of time" and "skeptical on cost versus return on investment" are the major concerns that hampering the intention of non-adopter firms to develop a website for their firms. These findings are consistent with other research (Alkalbani et al., 2012; Stewart et al, (2004; Walczuch et al., 2000). Previous study by Mui et al. (2002) showed that 'time consuming' and 'high initial cost' are the major factors that hindered the website adoption initiatives in Malaysian construction industry. Eventhough 'time constraint' is still a relevant factor, high initial cost is no longer a major concern to adopt a website.

The concerns pertaining to website adoption are relevant as majority of non-adopter firms are small in size, therefore constraint in resources especially manpower and financial are inherent with them. Inability to measure the tangible benefits especially in terms of financial out of the initiatives increased the perceive 'not lead to more efficiency, lower cost or more commission' and 'skeptical on cost versus return on investment'. Small firms need to be extra careful with their financial budget and physical evidence on financial returns has always



been the major consideration before making any decision on innovation adoption initiatives. Lack of time to manage the website is another issue in adopting a website due to the small number of employees, but hiring IT staff to manage the website will incur extra cost in operation. More often than not, the existing employees have their hands full with the core business and having a website might be seen as unnecessary extra load to the employees.

SUMMARY AND MANAGEMENT IMPLICATION

The website adoption rate in Malaysian cost engineering firms is 27.6%, and this figure will likely to increase in the nearest future as almost 12% is developing a website for their firms and 69% have intention to develop own website. In terms of profiles, adopter firms have been longer in establishment, consist of larger firms, enjoy higher average commission, projects are predominantly from private and public sector and have been involved with overseas project compared to non-adopter firms. Moreover, website adoption initiative is associated with larger firms, higher commission and involvement with overseas project. Non-adopter firms perceived that website adoption initiatives 'do not lead to more efficiency or lower cost', 'do not lead to lower cost', 'lack of time' and 'skeptical on cost vs ROI' have been major inhibition factors that hindered the adoption.

This study could be an indicative guideline for cost engineering firms to decide on website adoption for business. The adoption of website is associated with larger firms, higher average commission and involvement with overseas project. These indicate that website could have been one of the influences that speed up business growth and expansion beyond the local boundaries. At the very least, the adoption of website could be a virtual brochure for firms to market their services locally and globally.

CONCLUSION

Combination of click-and-brick promises huge entrepreneurial opportunities for business including knowledge-intensive services like cost engineering services. Despite the hype of website benefits in today's business landscape, the adoption rate in Malaysian cost engineering firms is relatively low and slow. The benefits are intangible and difficult to measure, hence increase the pessimism over the website adoption initiative. Nevertheless, majority of adopter firms enjoy business growth, higher commission and have been involved with overseas project. Website is a medium that is relatively cheap, multi-purpose and able to reach potential clients around the globe in seconds. Therefore, developing a website should be one of the strategic business moves that might be kick-start to business expansion and prosperity.

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