A SURVEY OF INTERNET USAGE IN THE MALAYSIAN CONSTRUCTION INDUSTRY

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SUMMARY*: In recent years, the construction industry in Malaysia seems to be using the Internet as much as other industries. However, what is the actual level of Internet usage in the construction industry and what are the perceived benefits and disadvantages experienced by the users? A survey was conducted to find the answers to the questions. Based on the survey, it was found that the respondents have accessibility to the Internet; comparable to countries such as the United States. However, the main use of the Internet is only for emails and information search. Use of the Internet for online bidding and e-meetings is almost negligible. Internet users experienced time and cost savings as well as increased efficiency. On the other hand, the survey found that the main disadvantages experienced are slowness in downloading, virus problem and frequency of being cut-off from Internet connection. As such, it is recommended that the relevant parties in the industry should look into provision of sufficient infrastructure and IT skills training to enable the workers in this industry to fully utilise the potential of the Internet instead of just implementing basic automation.*

KEYWORDS*: Benefits, Construction Industry, Disadvantages, Internet, Malaysia, Website*

1. INTRODUCTION

Malaysia was connected to the Internet in 1990 when the Internet Service Provider (ISP) JARING was launched by MIMOS Berhad. In 1996, Telekom Malaysia launched the country's second ISP, which is TMNet. (Rahmah, 1999).

In line with the National IT Agenda, which was formulated in 1996, the Malaysian Government has been aggressively promoting IT and its application in every sector including the construction industry. The Mid-Term Review of The Seventh Malaysia Plan 1996-2000 reported RM152 million (US$40 million) investment in IT from the construction sector in 1995 but there was a sharp decline in 1998 where investment in IT from the construction sector was at RM48 million (US$12.6 million). However, this decline was not due to a massive pullback on the usage of IT in construction but more likely to be caused by the economic crises that affected the East Asia region.

The Construction Industry Development Board (CIDB), the national body set up to standardize and modernize the construction industry, has also put in effort to promote IT in line with the government policy. They have launched an e-Construction Portal Exchange, which is an IT infrastructure to allow maximum and effective means of interaction among the industry players (Abdul Rahman, 2000).

In addition, various portals targeting the construction industry such as Icfox, Binaonline.com, Buildcom.net and Construction Asia have emerged in recent years. This augurs well for the construction industry but how well received are these portals? Do the players in the industry actually utilise the full potential of the Internet in their everyday dealings or are they just implementing basic automation such as e-mail?

There appeares to be no official statistics on the usage of Internet in Malaysia construction industry. No survey has been conducted on the industry as a whole except for a survey on the usage of ICT by quantity surveyors (Darmawan, 2000). Other research on usage of Internet in Malaysia focused on communication (Goh, 1997) and education (Yeap, 1998).

The feeling is that the Internet users have increased manifold in the last few years and that Internet is being widely used in daily dealings in the construction industry. However, information on the actual level of Internet usage in the construction industry is still lacking.

2. CONSTRUCTION SECTOR

The construction sector, in 1997, contributed 10.6% to the national GDP, second only to the services sector (11.06%) with the manufacturing sector a close third (10.1%). However, this sector suffered a contraction of 23.0% and 5.6% in 1998 and 1999, respectively. Efforts to revive the sector helped it to turnaround in 2000, contributing RM6,996 million (US$1,841 million) which is 3.3% of the national GDP (Eighth Malaysia Plan, 2001).

Currently, the total contracting firms registered with CIDB are in the region of 41,500 firms (CIDB, 2001). The registration of contractors are divided by category, starting from G1 for contractors qualified to tender for works not exceeding RM100,000 (US$26,317) to G7 where there is no limit to the value of work that the contractors under this category are eligible to tender (G6 contractors are allowed to tender for works not exceeding RM10million in value only). For the purpose of our survey, we are only focussing on the G7 contractors, which number 1,643 companies. Development companies registered with the Real Estate and Housing Developer Association are in the region of 800 companies. The professional firms that are involved in this sector that are registered with the various professional boards amount to about 3,083 firms. The professional firms include architect firms, town planning firms, engineering firms, quantity surveying firms and valuation firms.

3. THE SURVEY

The objective of this survey was to obtain the current levels of Internet usage in the construction industry in this country and the benefits and disadvantages experienced by the users in the said industry. This survey follows loosely surveys that were conducted in other countries on the impact of information technology in their construction industry. The surveys referred were conducted in the United Kingdom (Hamilton et al, 1995), Scandinavia (Howard et al, 1998) and Canada (Rivard, 2000). The survey questionnaire contained 12 multiple choice questions in 3 sheets of A4 size paper. Some of the questions allowed the respondents to give multiple responses to a question.

Our survey population consisted of contracting companies, development companies and professional firms, i.e. Architectural, Engineering, Quantity Surveying and Valuation firms. The sampling frame was compiled from the register of CIDB, housing association, the board of architects, the board of engineers, board of quantity surveyors and the board of valuers. Due to financial constraint, this survey could only afford the minimum sample size possible for a population size of 5,000. Based on the table by Rea and Parker (1997), the minimum sample size required for 99% levels of confidence is 161 samples. However, we have increased the sample size slightly to 200.

Firms/companies involved in the survey were randomly selected from both West and East Malaysia. Postal survey and emails were used in this research. The questionnaires were sent out at the end of November 2000 and replies were collected between the months of December 2000 and January 2001. Out of the 200 questionnaires that were sent, 70 firms responded, thus giving a response rate of 35%. The response rate is considered average in comparison with the response rate of other similar surveys as cited by Rivard (2000), which oscillate around 10%. (Rivard's survey had a return rate of 22%). We believe the scenarios obtained from this survey are sufficiently accurate in describing the levels of Internet usage by the respondent. However due to the low sampling size, the results can only be used as an indicative guide for the industry in general.

4. RESPONDENT PROFILE

Respondent were mainly from the professional firms (73%) followed by contracting companies (17%) and development companies (10%) as shown in Figure 1. It is commonly agreed that this type of survey attracts those using information technology to response and rebuffs those who are not (Rivard, 2000)(Doherty, 1997). As such, this gives an indication that the professionals firms make the most use of information technology in their work as compared to the contracting and development companies.

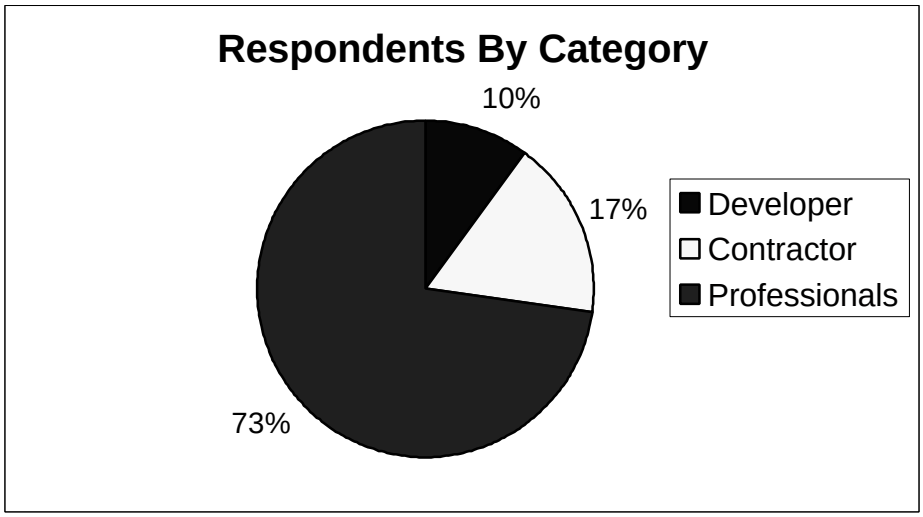

Figure 1: Respondents by Category In The Construction Industry

The geographical location of the respondents concentrated mainly in the Klang Valley (40%) and the northern region (30%). Meanwhile, 19% of the respondents are from the rest of West Malaysia and 11% from East Malaysia. The geographical coverage of the survey correlates with the main location of construction activities, which are in the Klang Valley and northern region of Malaysia. In addition, Klang Valley is the IT hub of Malaysia with a 50% share of the Internet business (Eighth Malaysia Plan, 2001).

5. THE FINDINGS

5.1 Connection to the Internet

94% of the respondent firms have access to the Internet. In comparison with the construction industry in the US, UK and Sweden, they have achieved above 90% accessibility to the Internet about two years earlier than ours. The comparison made was based on data from the following surveys: 96% in United States (Construction Industry Manufacturers Association, 1999), 97% in UK (Dixon, 1998) and Sweden 90% (Howard et al., 1998). We realise that due to the low sampling size, it is unreliable to generalize the result to the whole industry. However, this indicates that currently the level of Internet access is at a satisfactorily level even though we are slightly behind in catching up with the rest of the world.

5.2 Importance of Internet to the Firms

The respondents were asked to rank the importance of Internet to their firms in the survey. Figure 2 shows that 84% of the respondents indicate that Internet ranges from important to very important to their firms. Only 14% of the firms surveyed responded that Internet is not important to their firms.

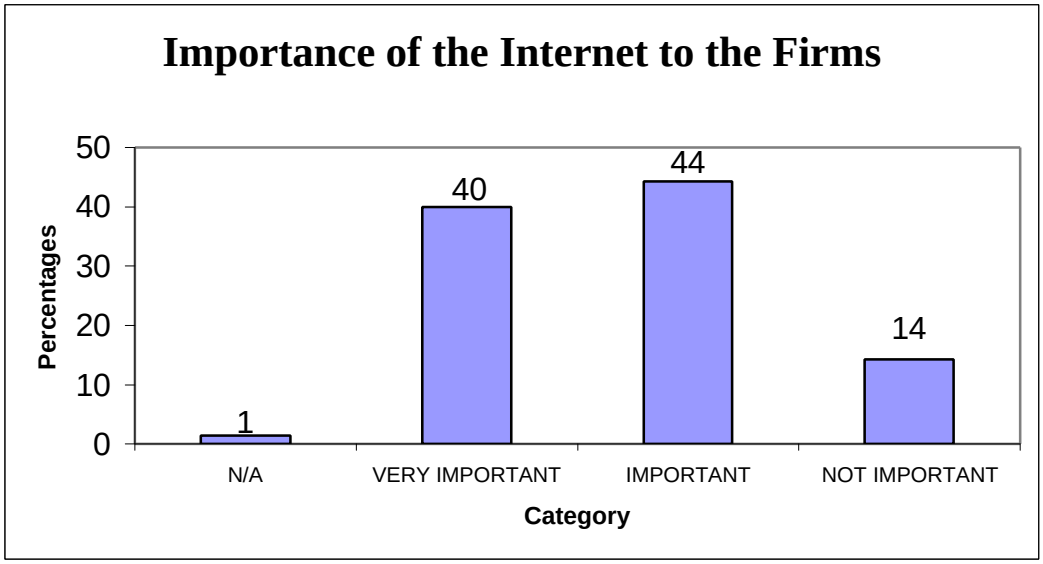

Figure 2: Importance of the Internet to the Firms

Even though majority of the firms (70%) only started accessing the Internet between 1 - 4 years ago, in the short span of time, the respondents indicated that Internet has become important to their firms.

5.3 Usage of Internet

We were also interested to know the reasons for using the Internet. Is it just for e-mail or more than that? From the response we received, we found that the main purpose of connecting to the Internet is accessing emails in which information and documents are shared and/or exchanged. Our survey shows that 96% of the respondents selected this as the main reason as shown in Figure 3. This gives an indication that businesses in the construction industry have now utilises information and communication technology in their business communication.

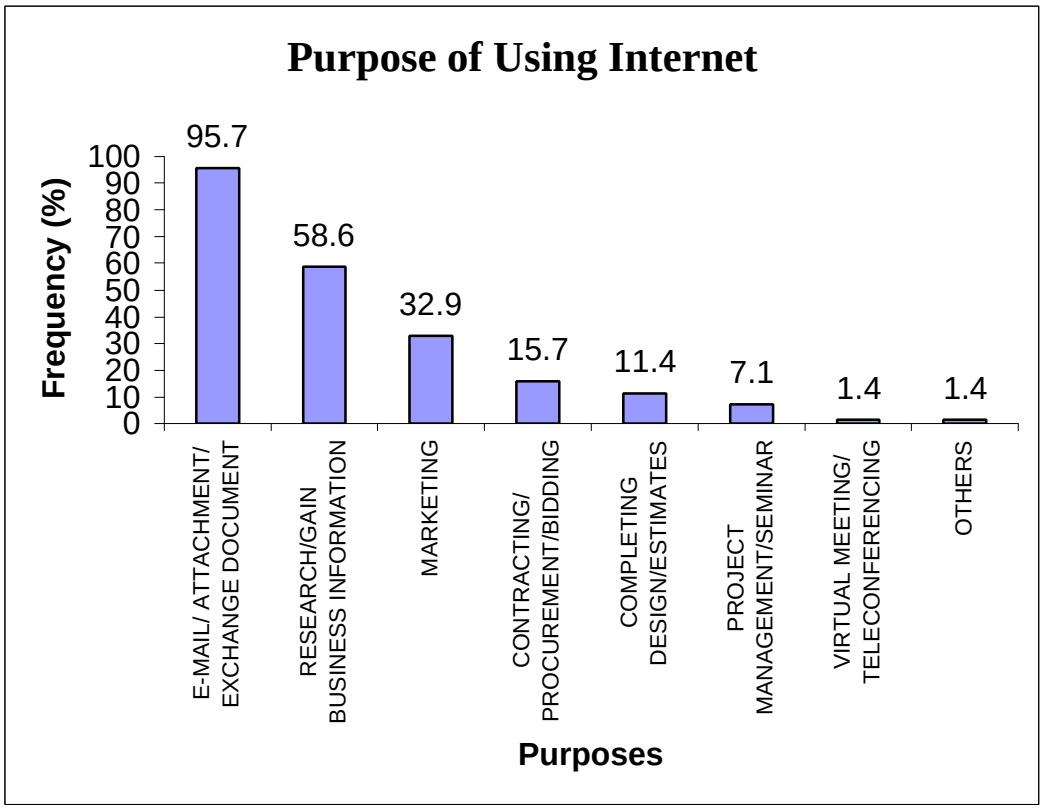

Figure 3: Purpose of Using Internet

Research and/or obtaining business information is the second most popular activity using the Internet at 59% while 33% of the firms surveyed use the Internet for marketing purposes. Compared to Canada where 38% of the firms surveyed use the Internet as a mean of communication for advertisement (Rivard, 2000), we anticipate that the usage of the Internet as a marketing tool may gain popularity in the coming years even though the percentage is still low at the moment.

The survey shows that bidding of projects through Internet is still not widely used here. Having said that, it is encouraging to note that 16% of the respondents were involved in bidding of projects through Internet. We suspect that the online bidding is for overseas projects and not local projects since there are hardly any or very few online bidding done locally. However, further research is needed to confirm this. The same is also true for designing and/or estimating through the Internet (11%). Using the Internet for designing and/or estimating is usually applicable only to firms that are working in collaboration with other firms from foreign countries. In addition, on-line seminar and virtual meetings are still not commonly conducted in this industry (7% and 1% respectively).

This shows that even though accessibility to the Internet is encouraging the usage of Internet in this industry is still limited to basic typical business processes such as e-mails and obtaining information. The users of Internet in this industry have yet to strategically exploit the potential of the Internet. The initial cost required for hardware and software to participate in activities such as virtual meetings may act as a deterrent factor to employers investing in IT for their firms. Another reason for this may be due to lack of knowledge on the part of the users. However, these reasons could not be verified in this survey and further research is required to confirm this.

5.4 Benefits obtained from the usage of Internet

The firms surveyed were asked what were the benefits they received from using the Internet and they were allowed to choose more than one answer that is relevant to them. Figure 4 shows the result. 60% replied that the usage of Internet contributed to time saving in their work. This could be attributed to quick data and information retrieval from the Internet while 51% agreed that the Internet improved the efficiency of their service. This finding correlates well with research done in the UK where the perceived benefits of IT systems could be summed up as 'greater efficiency' (Hamilton et al, 1995), in Scandinavian countries where they experienced increase in productivity (Howard et al, 1998) and in Canada where quality of document and speed of work have increased (Rivard, 2000).

47% of the respondents noted that they had gained cost savings after using the Internet in their business dealings. Cost savings due to the usage of Internet could be attributed to the reduction in postal, fax and courier services as documents could now be sent through the Internet, especially for big corporations that has intranets where time and costs are reduced due to shared information among its employees and office branches. Data from Sweden also shows that 60% of firms make some savings in administration (Howard et al, 1998). However, this needs to be investigated further as it contradicts with findings from Canada where costs of doing business increased upon adopting information technology (Rivard, 2000).

In addition, the lack of online discussion/meeting means that the firms were not required to be connected all the time and this again may provide some savings on Internet bills. However, we are unable to determine how significant the cost saving is.

Other than the above, 9% of the respondents experienced business expansion and obtained new projects from the usage of Internet. Meanwhile, 5% of the firms surveyed included reduction of employees as one of the benefits from using the Internet. Reduction of employees may also add to the cost saving benefits that some respondents experienced.

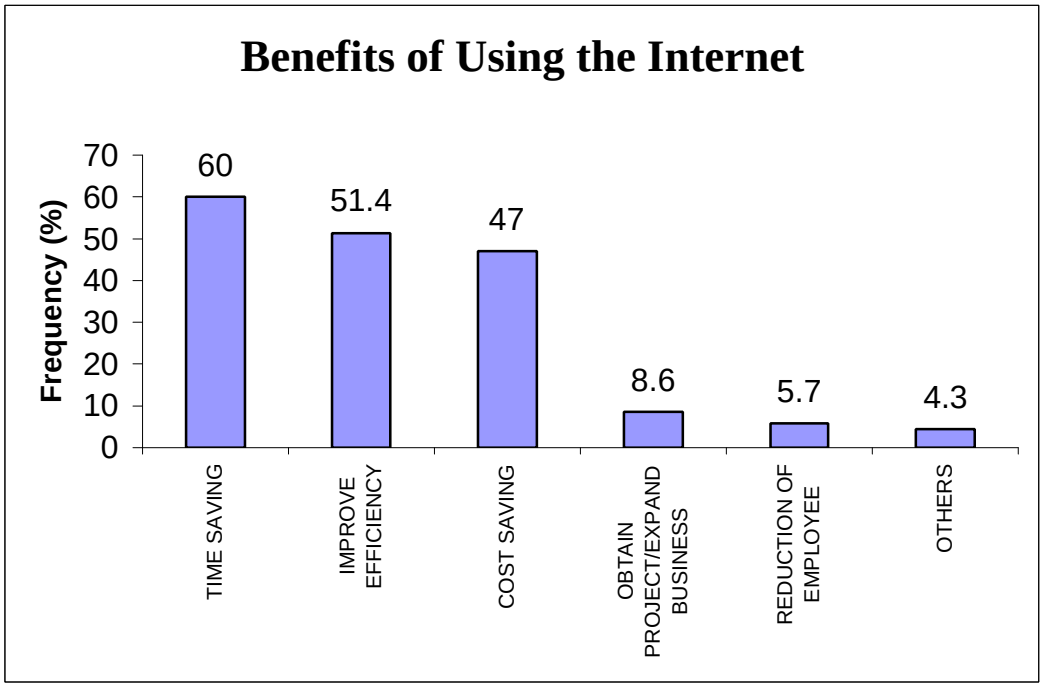

Figure 4: Benefits of using the Internet

5.5 Disadvantages of using the Internet

The respondents were asked to indicate the disadvantages that they experienced while using the Internet. Again, they were allowed to give more than one answer. The survey data for this is shown in Figure 5.

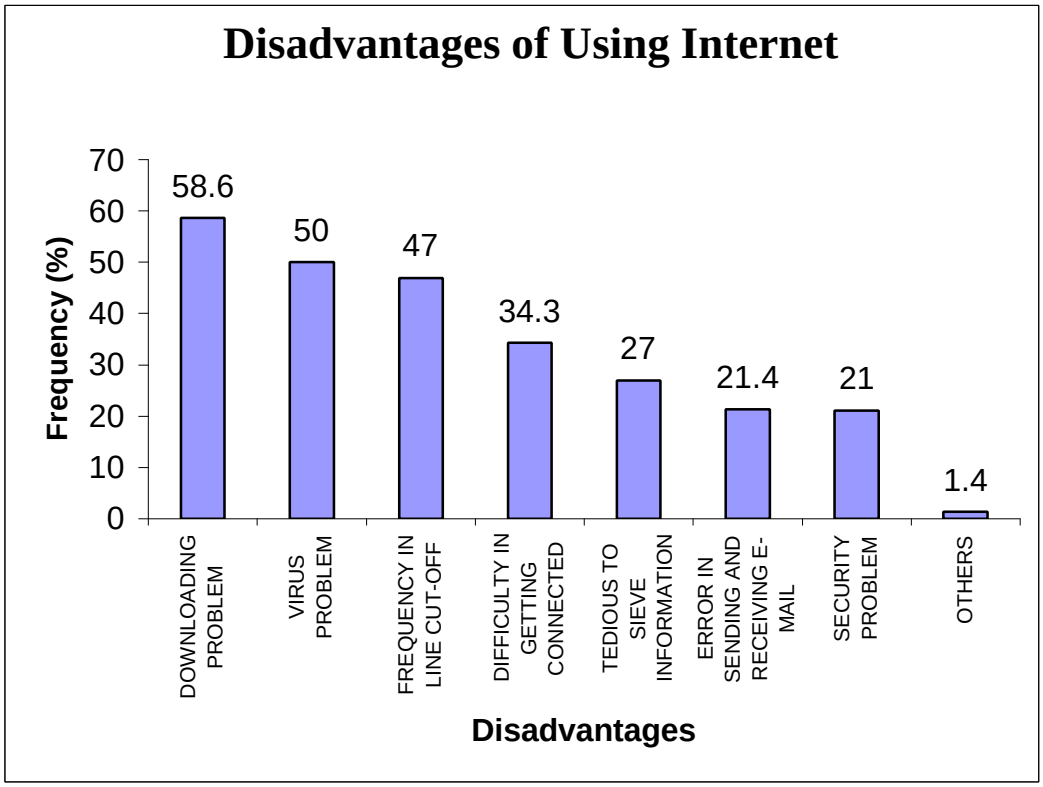

Figure 5: Disadvantages in Using the Internet

Slowness in downloading and transmission of virus is two of the major shortcomings highlighted by the respondent (59% and 50% respectively). As we did not ask the respondents to indicate their hardware capacities, we would assume that speed of connection and downloading could be improved with better infrastructure and the problem of virus transmission can be arrested by a reliable anti-virus programme most of the time.

The other 47% of the respondents faced connection problems where the major complaint is the difficulty in connection and the frequency of disconnection. This problem could be attributed to the inadequate infrastructure of the Internet Service Provider (ISP). The number of Internet subscribers in Malaysia has increased from 13,000 in 1995 to 1.2 million in 2000, contributing to 'traffic congestion' in connecting with the Internet. Six ISPs were granted licences by year 2000 but only three had started to provide Internet access to their subscribers (Eighth Malaysia Plan, 2001) and the latest ISP only started operation in 2001.

Other shortcomings highlighted are: difficulty to sieve information (27%), error in sending and receiving mails (21%) and security problems (21%).

5.6 Website

Out of 70 firms surveyed, currently only 24% have their own website. However, the survey shows that more firms will have their own website in the future as 21% of the respondent indicated that they are planning to have their own website.

5.7 Reasons for having a website

49% of the respondent did not give any reason for having a website. Given the high percentage, it seems that having one's own website could be due to the 'me too' syndrome as noted by Dixon (1998). However, further research is required to verify this.
From the survey, we found that popular reasons for establishing a website are for advertising (12%), company status (11%) and information for employees (10%). Most firms aim to reach out to more customers through the Internet, as well as to improve the image of the company. Figure 6 shows all the reasons selected in establishing a website by the respondents.
From the survey it is noted that firms also use the Internet as a means to receive feedback from their customers and to share information. However, the percentages of firms using this method is very small, i.e. 7% and 5% respectively. Feedback from customers is important to the firms as part of their effort to improve performance and service. In terms of e-commerce and online contracting/procurement, the construction industry is still slow in picking up this trend.

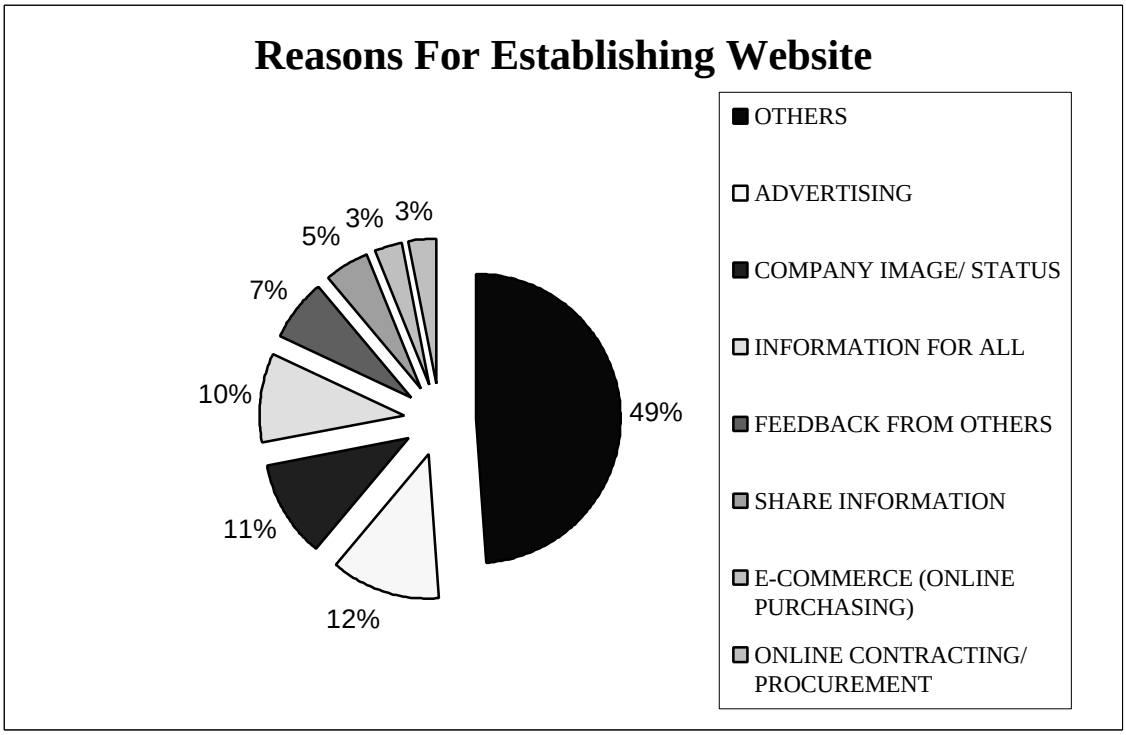

Figure 6: Reasons for establishing website

5.8 Problems in setting up website

In the same survey, we also wanted to know what the problems are that the firms faced in setting up their website. One of the major factors holding the firms back is that maintaining a website required too much time. For a website to be useful it has to be updated periodically and this naturally requires manpower and man-hours. As the benefits of a bsite are still not very clear to the firms, we believe the firms would be reluctant to invest in

setting up a website. This reasoning is also indicated in the survey data where 29% of the respondent comments that high cost is a deterrent factor.

In addition to the above, 11% of the respondent also mentioned security as a problem in having a website. More than 15% of the respondent did not mention a specific problem. We assume that this 15% could be due to a lack of existing info-structure and infrastructure in the firms. (See Figure 7).

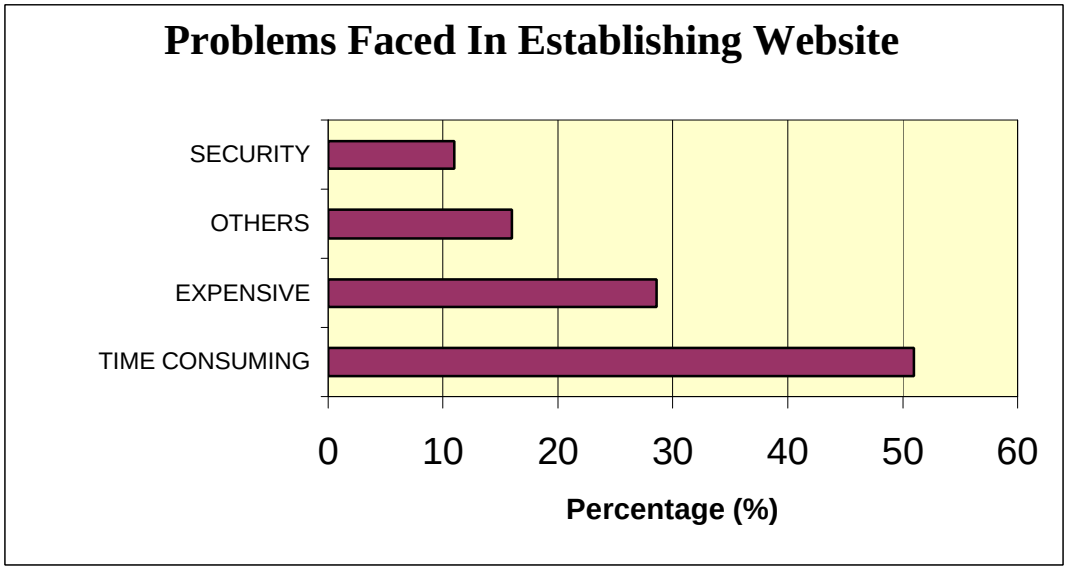

Figure 7: Problems faced in establishing website

6. CONCLUSION

It is undeniable that the Internet has made a major impact on the way business is conducted including the construction industry. As such, the Construction Industry Development Board, being a national body to spruce up the construction industry, should ensure that firms in the construction industry provide opportunities for their workers to be trained in the skills of information technology. Training should not only concentrate on general knowledge in using the Internet, e.g. emails and information search only, but also to upgrade the Internet skills to include e-bidding and e-meetings in an effort to fully utilise the potential of the Internet.

Improving the service of the Internet Service Provider is also an important factor in ensuring that the potential of the Internet will be fully utilised. Otherwise, problems such as slowness in connection/retrieval of information, frequent disconnection and lack of security will be a barrier to those wanting to use the Internet for business.

About half of the firms surveyed agreed that the Internet is important to their firms even though they were only connected to the Internet recently. It is also interesting to note that one-third of the firms use the Internet for marketing purposes and we foresee that this will be the trend in the future. Therefore, indirectly the Internet provides an additional marketing tool for the professional firms in the construction industry where currently marketing is still looked upon unfavourably in the professional circle.

Cost of connection to the Internet should not be a problem. This is supported by the survey where the respondents did not consider connection costs as one of the barriers in using the Internet. In addition, the respondents indicated that there are increase in efficiency and costs savings from usage of the Internet. Therefore, the rewards are there, if only there is a more systematic approach in the implementation of information technology for the construction industry.

In this survey most of the respondents indicated that they have access to the Internet and consider the Internet important to their firms. However, we also realise that the full potential of the Internet is not utilised by the

firms in our construction industry. We are only implementing basic functions such as e-mail and have yet to extend IT into the fundamental way business is conducted. In order to encourage more intensive use of Internet in strategic functions of operations and productions, we suggest improvement to the existing infrastructure and to produce more knowledge workers.

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