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An Objective Assessment of Commercial Usage of the World Wide Web

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Abstract

Few studies explore the commercial use of WWW largely using a survey methodology. Those few studies mainly examine subjective perceptions of organizational executives towards the business use of WWW. This study conducts an objective investigation of the issue by a random sampling, physically accessing to, and evaluating commercial WWW sites in 11 various industries in Singapore. Contents of WWW home pages are classified into 16 categories, which is drawn upon and extended from the framework proposed by Liu et al. (1997). A random sample of 250 WWW sites in Singapore industries was selected for the physical access and objective evaluation. This research note reports initial findings of this study.

1. Introduction

Internet users increase at an extremely high exponential growth rate every quarter. Internet has many applications such as e-mail, telnet, FTP (file transfer protocol), on-line discussion groups (for e.g., news groups), and the World Wide Web (WWW or Web in short). One of the main reasons for the explosion of Internet adoption and usage is because Internet technology has a great potential in commercial usage. In fact, the Internet business-to-business revenues in USA mounted to US\$41 billions in 1999, and they are predicted to increase at an exponential rate, as shown in Figure 1.

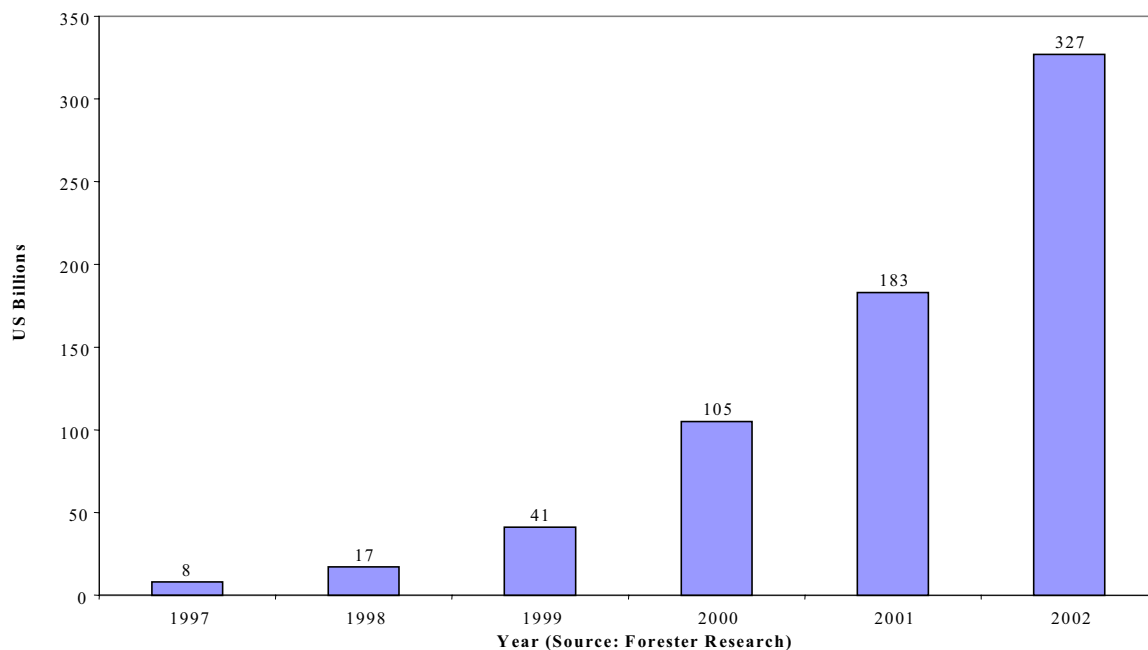


Figure 1. Internet Business-to-business Revenue in USA

Among Internet applications, WWW functions as the most significant driving force in the commercial usage of Internet technology (Cockburn and Wilson, 1996). WWW technology, including browser software such as Netscape, Internet Explorer, Mosaic, and Lynx, provides a business or an individual with instant access to an information ocean through hypertext links that can establish relationships among the otherwise unrelated bulk of information or messages. WWW has potential to support the redesign of information flows and organisational structures, help firms capture strategic advantages, establish new distribution channels, and create new information-based products (Jarvenpaa and Ives, 1996; Kalakota and Whinston, 1996; McKeown and Watson, 1996). In 1994, there were only about 15,000 WWW sites on Internet (e-land 1997), and by 1998, the number had increased to 300 millions and 1.5 million Web pages is born daily (Gromov, 2000).

Although Internet in general, and WWW in particular, seems to gain momentum to develop over years, on-line business or the business usage of WWW is still at the initial stage of its development, and its annual business transactions are relatively insignificant. Simply replacing conventional marketing channels of newspaper ads, TV commercials, phones, and fax with digital channels might not be enough to make electronic commerce prevail in the commercial world (Ho, 1996). Instead, we should study extensively what real value can be created and added by information technology in general (Ho, 1994), and by WWW in particular. However, academic studies are still scarce on this aspect. The few studies which explore the commercial use of WWW largely employ a survey methodology (e.g., Cockburn, 1996), and they mainly examine *subjective perceptions* of organisational executives towards the business use of WWW. We believe that an *objective investigation* of the issue may provide additional and valuable insights by a randomly sampling and physically accessing and evaluating commercial WWW sites in various industries. More specifically, this study intends to answer the following questions:

- (1) What are main business purposes of WWW presence for organisations?
- (2) Are some industries more active than others in establishing and managing a business presence on WWW?
- (3) What are important commercial contents that are normally included in most commercial WWW home pages?
- (4) Do the contents in real commercial WWW pages vary in different industries/businesses?
- (5) Are organisational business purposes of WWW presence related to characteristics of industries?

The findings of this study may be of significance. (1) If some industries are found to be more active than others in adopting WWW technology in their business, it can help WWW product vendors work out a more focused marketing strategy. (2) If different industries are found to have different business purposes of WWW presence that result in different commercial contents in their WWW sites, the findings may help Internet Services Providers (ISPs) to modify their Internet services as well as to help web site designers to design different WWW home pages that better meet different needs of various industries.

2. Research Methodology

This study is an initial exploratory research on the commercial use of WWW technology through a physical access and then an objective evaluation to WWW home pages of various organisations. There were already more than 300 million WWW sites on the Internet in the world by 1998 (Gromov, 2000). In this study, we only physically access to and investigate WWW sites of Singapore corporations. Queries were made using the search engines Yahoo and AltaVista to select WWW sites of Singapore corporations. From the collection of listings of WWW sites after the queries, an initial

random sample of 280 WWW sites was selected for physical access. Further, we were careful to ensure that big businesses, normally with more complicated WWW home pages, were not disproportionately represented in the random sample by randomly deleting some WWW sites of big businesses from the WWW site list (whenever necessary). Finally, a random sample of 250 WWW sites was chosen from the list after the deletion.

The Security Exchange of Singapore (SES) has classified all listed businesses in Singapore into five big categories: industrials, finance, hotels, properties, and plantation. Based on this broad classification, and consulting and discussing with some experts on this aspect, we divided all Singapore businesses into 11 different categories of industries:

- (1) Retail/Wholesale Trade
- (2) Information Technology/Computers
- (3) Manufacturing
- (4) Public Utilities
- (5) Tourism
- (6) Transportation
- (7) Finance/Banking
- (8) Design/Advertising/Press/Media
- (9) Properties and Holding (Real Estate)
- (10) Human Resources/Consultation
- (11) Others

Actually, the previous categories of “finance” and “properties” proposed by SES still exist in the new categories. The previous “hotels” category is included in the new category of “tourism”. The previous “plantation” category is placed in the new category of “others” because there are only a few plantation companies existing in Singapore now. The previous big category of “industrials” is broken down into several new categories: retails/wholesale trade, information technology/computers, manufacturing, public utilities, transportation, design/advertising/press/media, and consultation/human resources. This breakdown actually resulted in a more even distribution of number of companies in various categories for the 250 randomly sampled WWW sites.

Different organisations may have different business purposes of their WWW presence. After randomly accessing to a few WWW sites, we identified and defined following four major business purposes:

- (1) General Publicity
 - Contains company logo and mission statement
 - Describes company background and history
 - Displays company structure
 - Contains promotion information of products/services
- (2) Customer Support
 - Contains product configuration
 - Teaches customers how to maintain/repair products
 - Provides for download of software, drivers, etc.
 - Provides means of contact
- (3) On-line Information Exchange

- Facilitates on-line information exchange (e.g., internal search engine, sign up for guest book, interactive inquiries, etc.)

(4) WWW Sales

- Places an order on web sites with/without making payment

Different business purposes of WWW presence may result in different content being included in the corporations' WWW home pages. The classification of contents of WWW home pages suggested by Liu et al. (1997) was adapted with minor modifications. There are 14 categories of contents in Liu et al. classification: company overview/information, products/services, what's new, search, employment opportunities, interactive feedback, customer service/assistance, index/directory, financial facts, links to other sites, online business service/utilities, guest book, messages from CEO, and FAQ. Some researchers (e.g., Bakos, 1991) predict that WWW marketing will emphasise product/service differentiation rather than price competition, but others (e.g., Sprague and McNurlin, 1993) argue that both aspects should be emphasised. As a result, two content features are added into this study to verify this argument about pricing competition in WWW home pages – product/service price and price discount.

With the business categories, purposes of WWW presence, and content features of WWW home pages defined, we physically accessed each of 250 WWW sites of Singapore corporations.

3. Research Results and Discussion

The data collected by physically accessing to the 250 WWW sites provides a generally comprehensive picture of real commercial usage of WWW among Singapore industries and corporations. Figure 2 shows the number of WWW sites distributed among different business categories.

Surprisingly, the retail/wholesale industry took the lead in WWW business presence (69, 27.6%), rather than the IT and computing industry which took the second place (57, 22.8%) (even though both industries can be classified as front runners in WWW business presence). This may be explained by fiercer competition in the retail/whole industry in recent years. Singapore is a small country with only over 3 million population and many big international retail corporations such as Takashimaya (Japan), K-mart (USA), Yohan (Japan), Sogo (Japan), Marks & Spencer (UK), and Istan (Japan) have set up their department stores in Singapore. Many local small and medium size retail/wholesale businesses have been much affected by these big players' presence in this small but very competitive market. These local corporations normally cannot invest a lot of money in product promotion and advertisement in TV and other mass media as these big ones normally do. However, Internet marketing provides such an inexpensive and mass-marketing channel for these small and medium size corporations, that they actively set up their WWW home pages and become *front runners* in Internet marketing.

The result is that the retail/wholesale industry leads the IT industry in terms of WWW presence which is an interesting albeit surprising finding. The Singapore government has enthusiastically and actively promoted the development of its IT industry since the 1980s, and the IT industry has also received substantial governmental funding as well as preferential treatment under governmental tax and financial regulations and policies. But their business usage of WWW technology is still behind the retail/wholesale industry. This interesting result might indicate that the adoption of WWW technology into businesses may be largely driven (or pulled) by marketing forces rather than by

governmental policy pushing, even in a small country like Singapore where the government has a relatively tight control over its economy and politics.

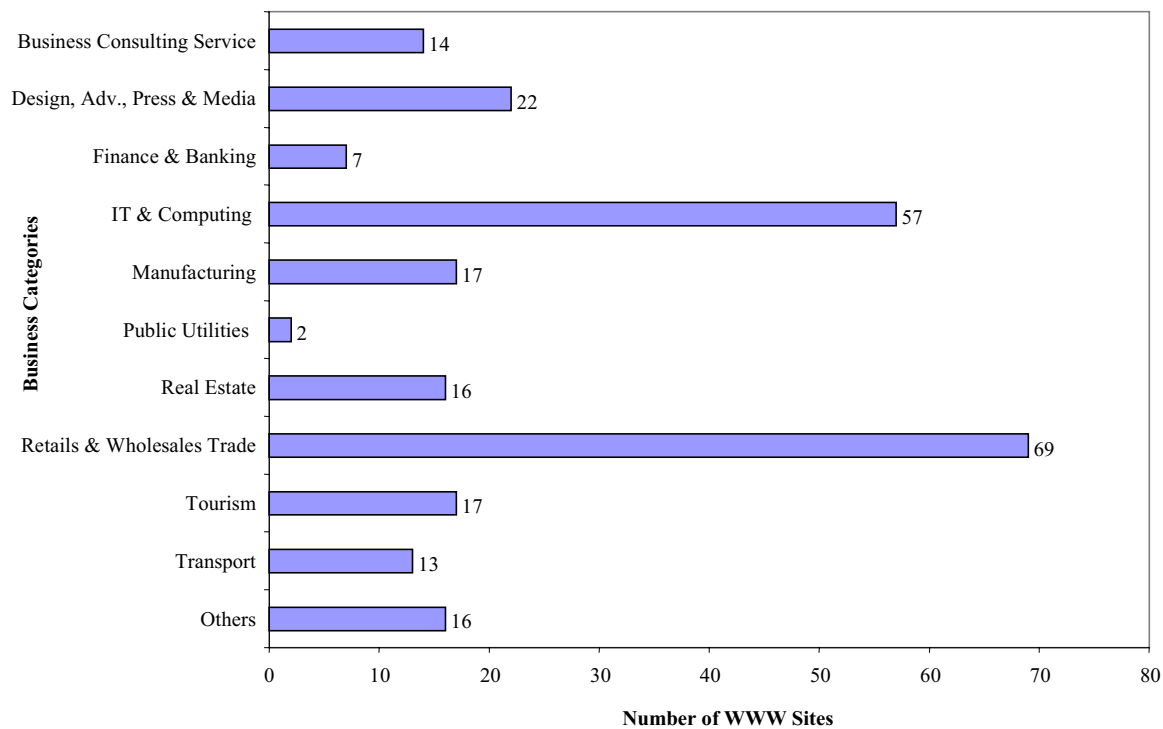


Figure 2. Distribution of Different Business Categories in Singapore

Another seven industries can be classified as *followers* in terms of the commercial use of WWW: Design/advertisement/press/media (22, 8.8%), Manufacturing and Tourism industry (17, 6.8%), Real estate industry (16, 6.4%), Consultation service industry (14, 5.6%), and Transportation industry (13, 5.2%). Finally, two industries can be defined as *slow movers*: Finance & Banking industry (7, 2.8%) and Public Utilities (2, 0.8%). The industry of finance and banking has normally invested substantial amounts of money in IT, but banks and financial institutions have not actively adopted the newest Internet technology in their business usage. This strange phenomenon may be explained by the business nature of the industry. Obviously, the finance and banking industry directly deals with money and its transactions, which requires a very high level of security guarantee. As Internet is a relatively new technology and the security issue in Internet marketing and electronic commerce has not been fully resolved (e.g., Bhimani, 1996), the finance and banking industry could be generally conservative about its presence in WWW home pages.

Because 250 WWW sites were randomly selected from all businesses in Singapore, Figure 1 should give us a general and overall picture of the commercial usage of WWW home pages across various industries in Singapore.

Figure 3 shows the different purposes of WWW presence for all businesses.

All corporations having WWW presence intend to publicize their corporation names, images, and/or products/services (publicity: 100%), followed by the purposes of online information exchange (26.8%) and customer support (19.6%). The least purpose for setting up WWW home pages seemed to be in order to achieve sales on the Internet, that is, to carry on electronic commerce (17.2%).

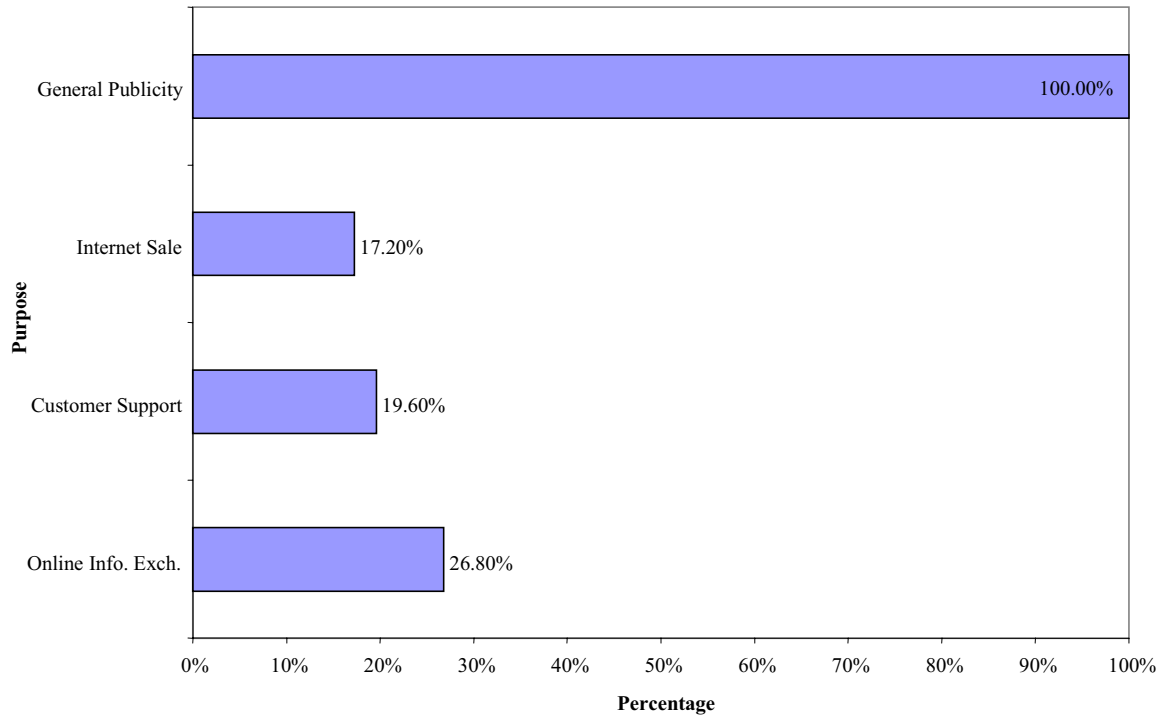


Figure 3. Different purposes of WWW presence for all businesses

The results show that the era of electronic commerce had not come to Singapore and most corporations were not motivated by Internet sales to set up presence on the WWW. What they thought to do was rather to publicize their company names, images, and serve their customers and/or suppliers better. The Internet security issue and customers' inertia in preferring old purchasing behaviors could be two of the main reasons for lack of interest from most corporations in Internet sales for the time being.

Figure 4 depicts the purposes of WWW presence for each of the 11 business categories.

Figure 3 gives an overall picture of purposes of business usage of WWW home pages for all industries. Figure 4 reveals different purposes of WWW presence from each of 11 industries. Because all industries have the purpose of publicity in WWW home pages, the publicity purpose is excluded from Figure 4.

Even in the same category of front runners, the retail/wholesale industry has different purposes for its WWW presence from those of the IT industry. The retail/wholesale focus is more on Internet sales (35%), followed by customer support (17%) and on-line information exchange (12%). It seems that the retail/wholesale industry is mostly interested in making profit directly from its WWW presence. But the IT industry places more emphasis on customer support (40%), followed by online information exchange (32%) and Internet sales (24%). It seems that the IT industry mainly intends to use WWW home pages to attract and serve customers.

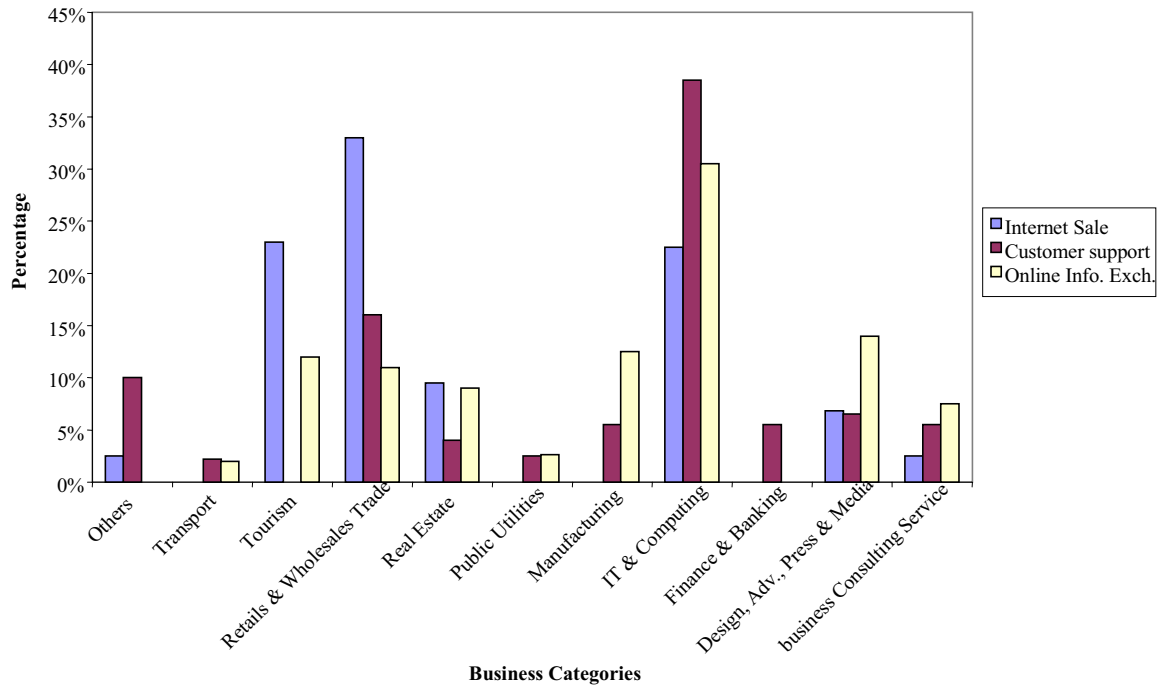


Figure 4. Different purposes of WWW presence in each business category

Achievement of Internet sales is the main purpose of WWW presence for the retail/wholesale industry, which is in contrast to the finding for overall industries as shown in Figure 3. Again, this industry takes the leadership in electronic commerce rather than the expected IT industry, which seems to provide additional evidence to show that marketing forces may be more important in driving the adoption and diffusion of electronic commerce than other forces such as government policy and support. But one concern for the retail/wholesale industry is that it has paid less attention to the use of WWW home pages to support customer service. Only 17% of corporations use WWW technology to do so. Since customer service is very important to the retail/wholesale industry, the industry should make a better use of WWW technology to support customer service in the future. The IT industry should actually lead other industries in terms of promoting Internet sales and electronic commerce because it has all the required technical expertise and manpower and it receives much more governmental support. Further, computer software is easily marketed, sold, and downloaded on the Internet. This can eliminate many middle-men companies such as physical distributors and agents and can thus substantially reduce transaction cost and increase a company's competitiveness in markets. Hence, there is a big potential for the Singapore IT industry to provide Internet sales in the future.

In the category of followers, that is the less active companies, purposes of WWW presence also vary in different industries. Most of the companies in the tourism industry tend to offer Internet sales most (23%). Their next most likely offering is online information exchange (12.5%) and only 0.1% offer customer service. It seems that this industry has started to realize the great potential and importance of using WWW technology in its business, but it has overlooked the potential of using the technology to support customer service. For manufacturing industry, the sequence of the purposes is online information exchange (12.5%), customer support (7.5%), and Internet sales (0.1%). Hence, most manufacturing corporations make use of WWW home pages as showcases of their products but do not attempt to sell them out electronically. To the design/advertising/press/media industry, the purposes range from online information exchange (14%) and customer support (8%) to Internet sales (7%).

The slow movers in the finance and banking industry seem to focus on customer support (6%) rather than online information exchange (0.1%) and Internet sales (0.1%).

To summarise, industries generally have different purposes in creating and maintaining a WWW presence. This finding should have its important implications for WWW technology vendors, which will be discussed in Section 4.

Figure 5 depicts the different content features of WWW sites for all businesses.

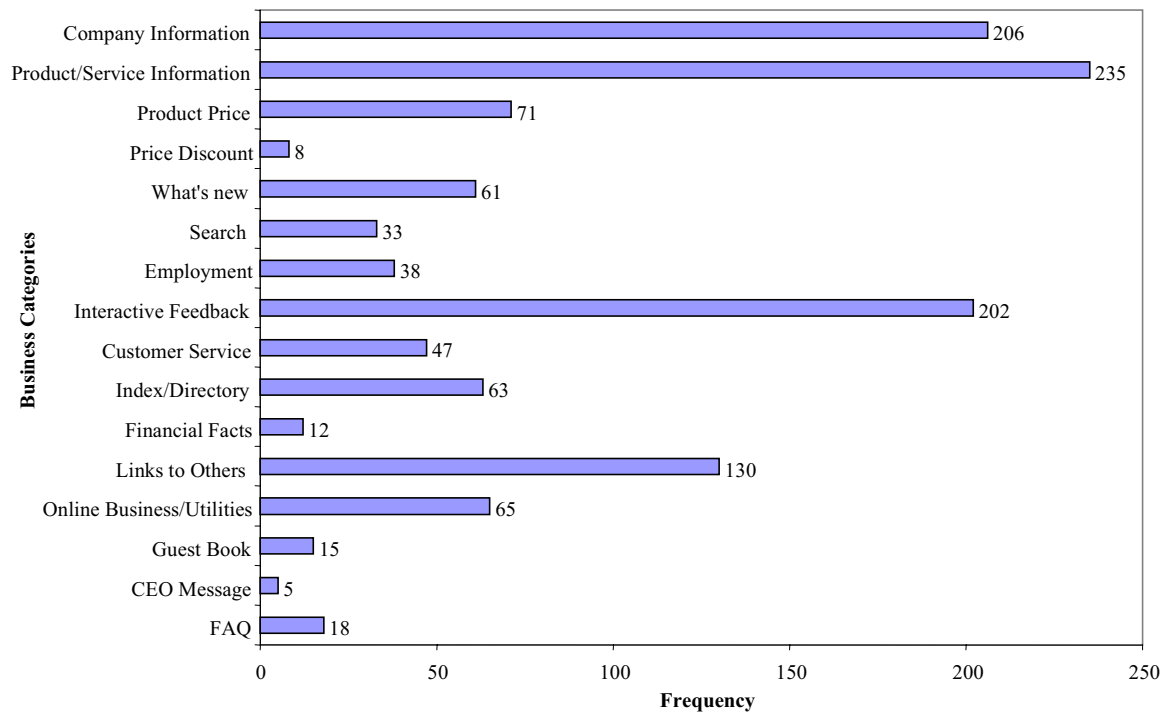


Figure 5. Different content features of WWW sites for all businesses

In general, those corporations with WWW presence are most likely to fill their WWW home pages with contents of their product/service information (94%), company information (82.4%), and interactive feedback (80.8%), as well as with links to other sites (52%). These contents mainly serve the purposes of publicity and online information exchange, which was in line with the findings of Figure 3. The secondary important contents in WWW home pages include product price (28.4%), online business/utilities (26%), company index/directory (25.2%), and what's new (24.4%).

The contents apparently considered less important to business usage of WWW home pages and less frequently displayed on the home pages by Singapore corporations are as follows: customer service (18.8%), employment service (15.2%), search (13.2%), FAQ (7.2%), guest book (6%), financial facts (4.8%), price discount (3.2%), and CEO message (2%).

A deeper examination of the content features indicates some concerns about the WWW presence of Singapore corporations. Firstly, attracting and serving customers are considered critical to Web-based business applications (Panurach, 1996). But our investigation indicates that only 18.8% of all corporations with WWW presence have included customer service as a specific content in their home pages. FAQ represents another type of content closely related to customer service and they

only appear on 7.2% of the sampled home pages. Secondly, product prices are seldom displayed on WWW home pages (28.4%), and even fewer corporations (3.2%) show price discounts available on their products/services on Internet although discounts should be essential information to attract customers to conduct Internet purchasing electronically. Thirdly, the very low percentage of WWW home pages which display a message from the CEO may indicate that WWW presence has not received full and enthusiastic support from CEOs of Singapore corporations. If this is true, lack of full and continuous support from CEOs can be another very important factor in the slow adoption and usage of Internet sales and electronic commerce in Singapore organisations.

4. Conclusions

This article has investigated commercial usage of WWW technology across 11 industries in Singapore by physically accessing and objectively evaluating content features of corporations' home pages. The main conclusions of the research findings can be drawn as follows:

- (1) All corporations with WWW presence have the purpose of making use of WWW technology to promote their general publicity. The secondary purposes include online information exchange such as search information and/or interactive inquiries, and customer support. The least pursued purpose is for Internet sales. Hence, the era of electronic commerce has not come yet in Singapore. Main reasons for this phenomenon, even after the strong pushing and promotion of electronic commerce by the Singapore government in recent years, might be due to concerns over Internet security and lack of enthusiastic support from CEOs of Singapore corporations. This finding may help ISPs and WWW service companies to adjust their marketing strategies and web designs to better match corporations' current purposes for their WWW presence.
- (2) Not all industries are equally actively exploring the potential of WWW technology in their businesses – the WWW presence of 11 different industries varies. In Singapore, the front runners in the adoption of WWW technology in their business activities are the retail/wholesale and the IT industry. The followers consist of the industries of manufacturing, tourism, design/advertising/press/media, real estate, consultation services, and transportation; and the slow movers include public utilities and finance and banking. As a result, ISPs and WWW service companies should work out different marketing strategies for different industries. For example, they should spend more time and efforts in marketing their latest WWW technological products and/or services to the front runners, and at the same time, keep continuous marketing contacts with the followers. Less time needs to be spent for the slow movers for the time being.
- (3) Currently, most Singapore corporations prefer to display messages and contents of product/service information, company briefing information, interactive feedback, and links to other WWW sites on their WWW home pages. The next most popular types of contents are: product price, online business/utilities, company index/directory, and what's new. Other contents that are less likely to appear in WWW home pages include customer service, employment service, search facilities, FAQ, guest book, financial facts, price discounts, and CEO messages. These findings can help ISPs and WWW designers to modify the format, layout, and style of currently designed WWW home pages, in order to emphasise the preferred contents by industries and corporations as shown above.
- (4) The purposes for having a WWW presence also vary across the eleven different industries. Our investigation shows that purposes for a WWW presence are related to the different characteristics and competitive conditions of industries. In general, for those industries such as

the retail/wholesale and the tourism industry which are facing strong competition in markets and whose products/services are suitable for direct marketing or Internet marketing, the WWW presence is more likely to be directly targeted at Internet sales; whereas for industries such as the IT and the finance and banking industry, in which professional expertise and quality service are most important factors to their business success, the WWW presence is more focused on customer support and online information exchange, in order to differentiate their products/services from their competitors. Therefore, ISPs and WWW designers should study industrial characteristics, marketing competition, and different purposes of various industries in order to identify the fit between differing purposes of WWW presence and layouts, contents, and features of home pages which they designed. In other words, WWW home pages cannot be designed in the same way for different industries.

- (5) It may be because it is largely driven by marketing forces that the retail/wholesale industry takes the leadership in Internet sales as well as in WWW presence among Singapore industries, even though the industry is not well equipped with IT-related resources, and has not been well supported by Singapore governmental policies and funding. Hence, to speed up the adoption and usage of electronic commerce and Internet sales, marketing mechanisms should be carefully studied besides governmental support and direct funding.

Our findings indicate that most corporations in Singapore do not reveal the information on product price and price discounts on their WWW home pages, which supports the speculation that Internet marketing currently places more emphasis on product/service differentiation than price competition (e.g., Bakos, 1991). But because Internet marketing is still at the early stage of its development, and pricing is a very important factor for a business's competition strategy and for customers to make a final decision to purchase any items electronically, the pricing strategy and competition for Internet marketing may become more important in the future.

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