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A Global Perspective of Business Usage of Web Technology

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ABSTRACT

Despite the recent downturn in Internet and telecommunication sectors, e-commerce is forecasted to continue to grow and corporate websites have remained as important communication channels for both businesses and consumers. However, many multi-nation corporations (MNCs) use the same business websites for their business transactions in all of their business locations, even across national boundaries. Does this kind of "one website fits all" mentality of using Web technology really work well in reality? Does national culture matter in terms of influencing the adopting of Web technology for commercial usage in MNCs? Whether corporations in different countries/cultures use Web technology differently in their commercial websites? This paper intends to explore the above important research issues through examining and comparing the usage of commercial websites among corporations in two different countries: Singapore and the United States.

Keywords: Web, Electronic Commerce (Business), USA, Singapore, Global

1. INTRODUCTION

Over the last few years the Internet has evolved to a platform that is enabling a new generation of businesses. Companies have realized the tremendous opportunities the Internet offers and have established an online presence with sound business models. In general, e-commerce can be defined as buying, selling of products, services, and/or information that use the Internet and Web technology (Hof & Hamm, 2002). E-commerce is proved to have abilities to enhance economic growth, reduce barriers of market entry, improve efficiency and effectiveness, keep inventories lean, and cut cost (Madden & Coble-Neal, 2002).

At the same time, consumers have found the power on the Internet: convenience, greater choice, vast amount of information, and time savings, are not going to let challenging economy stop them to taking advantage of it. The number of business to consumer (B2C) spending is expected to reach \$95 billion in 2003, and could reach \$250 billion in 2005. Moreover, the business of business (B2B) online transactions now stand at \$2.6 trillion, not the originally expected \$1.3 trillion, and analysts are revising their estimates of productivity gains sharply upward (Mullaney, Green, Arndt, Hof, 2003). Indeed, e-commerce has transformed entire industries globally and the Net is really "changed everything" and even more startling changes are on the horizon.

2. RESEARCH BACKGROUND

This paper intends to study and compare the Internet's business usage among corporations in the U.S. and Singapore, in order to explore whether national culture could be an important factor influencing the Internet usage in business corporations. These two countries are from two different continents across the globe and can be viewed to best represent members of its respective continent.

The U.S. has the largest number of online users in the world. The U.S. broadband subscriptions which allow speedy connection to the Internet doubled since 2001 and are growing at 56% annually. It is expected to reach 40 million households at the end of 2003 (Forrest Research, 2003). Studies have found that Internet and Web are not only used to generate revenues, but also used as tools to increase productivity in the U.S. In fact, productivity growth is doubled as the Web proliferated since 2000 (Mullaney, Green, Arndt, and Hof, 2003). More and more companies are utilizing the Internet medium for advertising purpose to attract customers online. According to AdRelevance report in 2003, a division of market researcher Nielsen-NetRatings, big advertisers are showing renewed interest in online advertising after the downturn of the economy. Purchases of Web ads rose to \$3.2 billion in the first half of the 2003, jumped from \$2.8 billion in the same period of 2002. "Search-related" advertisements, which appear alongside results on well-trafficked Web-search sites, are particularly popular (Mangalindan, 2003). This is not only helping boost the sales and fortunes for the businesses, it also helps businesses to target their potential customers.

Singapore, on the other hand, is the seventh in terms of preparedness for e-commerce. Singapore government has also been extremely supportive of its e-commerce activities. It has played a multi-faceted role of being both the user and promoter of e-business application in the country. Concrete steps have been taken to position Singapore as a global node and regional hub in e-commerce. The Electronic Commerce Master plan was launched in 1998 and the legal framework has been updated through the passing of the Electronic Transaction Act. The government strives to build up research capability by encouraging leading e-commerce research companies to be based in Singapore. Singapore encourages local establishments to link up with international research centers in order to learn from

others and to share their expertise. The number of Internet dial-up subscribers in Singapore increased from 139,000 in January 1997 to over 1,943,800 in 2001, placing Singapore at the seventh out of 60 countries in terms of preparedness for e-commerce. Statistics have shown positive outbreak of revenues from e-commerce. For instance, according to the Info-communications Authority of Singapore (IDA), the revenues from e-commerce sector was to top about US\$1.4 billion in 2001 as compared to US\$659 million in 2000. Statistics have also shown a higher amount of people buying items such as airline tickets, books and CDs, and reserving hotel rooms through the Web.

3. RESEARCH QUESTIONS

Although commercial websites are expected to grow to 200 millions by 2005 (Palmer, 2002), the business usage of Web technology to reach a large number of customers worldwide remains a big challenge for many multi-nation corporations (MNCs). Customized Web design with multi-language support alone, however, is not enough. Website builders must also consider political, cultural, social, and legal differences in the global environment. For example, culture provides people with a sense of identity and an understanding of acceptable behavior within society. Culture includes values, shared beliefs, or group norms that have been internalized by individuals with some modification (Hofstede, 1980). In addition, culture influences peoples' perceptions and their interpretation of the world. It influences their expectations, values, beliefs, attitudes, and ultimately their behaviors in everyday life (Adler, 1991). Groups of people have unique backgrounds because of their shared history, economy, geography, religion, and demographics. Therefore, it is important for MNCs to understand how culture may influence the business usage of Web technology on a global scale.

The U.S. is traditionally recognized as having a strong culture based on individualism that stresses independence of each individual within a society. On the other hand, Singapore focuses more on collectivism and emphasizes the goals of the group over personal goals, stresses conformity and in-group harmony, and defines the self in relation to the group (Lu, Rose, & Blodgett, 1999; Triandis, 1995).

Although several studies addressed the usability and design of Web sites (e.g., Palmer 2002, Paerrow 2000, Nielsen 2000, Shneidermann 1998), none have extended their studies to across national boundaries to examine the website usages in a global environment to our best knowledge. Therefore, a study in this topic will help fill the gaps. This study intends to examine and compare the Web usage of businesses among corporations in the U.S. and Singapore. The two countries are from two different continents across the globe and can be viewed to best represent members of its respective continent with its

culture background. The specific research questions are:

- *What are the main features of the corporations' web sites in these two countries?*
- *What are the important contents that are normally included in most commercial web sites in these two countries?*
- *Is the usage of web sites in business corporations related to the characteristics of the industries that the corporations belong to?*
- *Are there any differences of using web sites in these two countries?*
- *Does culture play a role in the site differences in these two countries?*

4. RESEARCH METHODOLOGY

In order to do a comparative analysis of commercial website usage among corporations in the two countries, a common assessment framework was used to collect data and conduct the comparative analysis. The framework consists of 14 main categories describing the commercial usage of web technology (e.g., Cheung and Huang, 2002; Liu, Arnett, Capella, and Beatty, 1997), as shown below.

- **Company overview/information:** Brief history; how the company organized and operates; company capability; general business environment; challenges, etc.
- **Products/services:** Main products and services.
- **What's new:** News releases for the products and services; updated news; pertinent industry information; new announcements; hot topics, etc.
- **Search:** Search engine for users to locate available interested items within the company's home page.
- **Employment/Career opportunities:** Available opportunities for certain positions and their descriptions.
- **Interactive feedback:** Requesting viewers to respond about their feelings/suggestions about a company and/or web home page.
- **Customer service/assistance:** Answering questions; sending forms to relevant person for products/services support; providing necessary help, etc.
- **Index/directory:** Company's Web site direction or map; location distribution; department addresses; office phone numbers, etc.
- **Financial/Investment facts:** Detailed financial performance
- **Links to other sites:** Connection with Internet yellow page, weather, stock, quotes, news groups or third party vendors.
- **Online business:** For information transformation on ordering/banking through the company's home page.
- **Guest book:** Requesting customers to sign in by providing their names and addresses.
- **FAQ:** Questions and answers for the frequently asked questions about the company, its products, its services, its website, or something else.

- Messages from CEO: Greetings and brief introductions from CEOs

Then the authors of this paper accessed to more than 700 commercial web sites and collected data based upon the framework. More specifically, Fortune 500 corporations were chosen as the data points representing US corporations. These companies' Web sites generally provide a leadership of using information technologies (Liu et al, 1997). In Singapore, a total of 250 Web sites were randomly selected based on queries results of using search engines Yahoo and AltaVista. These corporations' web sites represented 11 main industries in Singapore (Cheung and Huang,2002). In addition, an extensive search has also been done to collect the most updated information on e-commerce in these two countries, using mainly the search engine of GOOGLE and OCLC library search.

5. RESEARCH FINDINGS

5.1 Company Size with regards to E-commerce embracement

U.S.

Results from the United States regarding e-commerce embracement seem to differ from those of Singapore. Many small sized companies are moving faster and getting dramatic results using direct selling on the Web. They tend to take more advantage of the low cost advertising and saved space on the Web to generate revenues, whereas most of the large companies such as the Fortune 500 tend to mainly announce their presence and promote their companies' image, enhance public relations, etc.

Singapore

On the other hand, the growth of e-commerce has been unevenly distributed. Large enterprises have generally been more ready to embrace e-commerce than small enterprises. 96% of the large enterprises are equipped with Internet access as compared to 86% for the small enterprises. Also, about 61% of the large firms have their own websites, compared to only 32% among the small enterprises.

5.2 Industry's Web Presence

U.S.

As indicated above that the Fortune 500 companies were selected to represent the United States because they usually provide the leadership in the use of information technology. Industry types are classified into 11 divisions by Standard Industry Code (SIC) of which, the Fortune 500 comprises of 9, with statistics of percentage Web presence shown below in Table 1.

In the case of the Fortune 500, the Transportation industry seems to be the leader in Web presence. However, it should be noted that the industry category is

classified differently from how it is for Singapore. For Singapore, the Retail and Wholesale industries are combined into one; whereas for the Fortune 500, the Retail Trade and Wholesale trade are distinguished, thus making the statistics percentage lower than that of Transportation industry. Nevertheless, it is evident that the Retail/Wholesale industry will place the highest on the scale.

Table 1: Industry's Web Presence in U.S.

Industry	WWW presence
Transportation, communication, electric, gas, sanitary services	87.10%
Retail Trade	68.10%
Manufacturing	63.60%
Finance, insurance, real estate	53.30%
Services	51.40%
Agriculture, forestry and fishing	47.40%
Wholesale trade	42.30%
Construction	14.30%
Mining	0.00%

Another internet-related activity big company involved in is e-procurement. Even though the connection on the Internet has been established, most companies do not seem to take full advantage of it for e-procurement. According to a study by Hurwitz Group, less than one-third of Fortune 500 businesses order strategic goods from online suppliers. VP of e-business Strategies at Hurwitz Group said despite the promise of tremendous benefits from e-Procurement, including perceived savings of up to 50 percent in purchasing costs, most companies are not measuring these anticipated benefits.

Most e-procurement systems being utilized lack support for complex procurement processes, including contract management and negotiation. The study from Hurwitz Group stated that companies may work with thousands of suppliers, but fewer than 100 suppliers were linked to their e-procurement system. The study also found most companies that do make purchases online are performing indirect purchases of maintenance, repair, and operational goods and services instead of using e-procurement to purchase direct goods to automate production or manufacturing processes.

Singapore

The SES – Security Exchange of Singapore classified all listed businesses in Singapore into 5 big categories: industrials, finance, hotels, properties, and plantation (Cheung and Huang, 2002). Based on this categorization, another set of categories of businesses has been further developed, dividing the Singapore businesses into 11 categories, including:

1. Retail/Wholesale Trade
2. Information Technology/Computer
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 Resource/Consultation
11. Other

Retail/Wholesale industry takes the lead in WWW business presence with 27.6%. This is an interesting finding for Singapore since the industry type that takes the lead in Web presence is not Information Technology, which places 2nd on the scale with 22.8% Web presence. This difference is explained by the fierce competition in retail/wholesale industry. Singapore is a small country with the population of about 4 million (The World Fact Book 2002), with many big international retail corporations competing against each other. With such tight competition, small and medium sized companies have turned to e-business as their solution since the Internet provides inexpensive and mass marketing channels, versus the unbearable cost of advertising on TV as well as other mass media. Another important factor to note is the Singapore government has been very supportive of the development of its IT industry. The IT industry has received substantial government funding as well as preferential treatment under government tax and financial regulations and policies (Cheung and Huang, 2002). However, the difference in the total number of companies going online has indicated that the adoption of WWW technology is most likely not driven by government backup, but rather by competitive marketing forces. These two industries are classified as early adopters in the WWW presence. The next categories of industry are classified as early majority in terms of adopting WWW for commercial use. Statistics on each industry's Web presence is summarized below in Table 2.

Table 2: Industry's Web Presence in Singapore

Industry	WWW presence
Retail/Wholesale	27.6%
IT	22.8%
Design	8.80%
Manufacturing & tourism	6.80%
Real Estate	6.40%
Consultation service	5.60%
Transportation	5.20%
Financial/Banking	2.8%
Public Utilities	0.8%

The low percentage of Web presence of Finance/Banking industry at the time of the research is explained by the fact that the industry deals with money and volatile information. Its transactions require a high level of security guarantee. Since the Internet is not truly known for being the safest place to store such

information, i.e. there are still problems with the system being hacked into. Thus, this could explain somewhat the reason for the low figure in Web presence of banking industry. A general chart showing the percentages of companies that have web pages in different industries across the two countries is also composed as following in Figure 1.

Figure 1 shows that the U.S. tends to lead WWW presence in Manufacturing and tourism industry, whereas Singapore leads the WWW presence in its Retail/Wholesale sector. More specifically, the top three industries with WWW presence in US are Transportation/Communication/Electronic, Retail Trade and Manufacturing; the top three in Singapore are Retail/Whole Sale, Information Technology, and Design. Therefore, the two countries differed in web presences of industries.

5.3 Features on Commercial Web Sites

U.S.

The main features found on websites of Fortune 500 include: products and services, company overview, feedback, what's new, financial facts, customer service, search, employment opportunities, guest book, Index or directory, online business, links to other sites, CEO messages and frequently asked questions (FAQ). It indicates that most companies go online to introduce their products/services to a larger market target at a lower cost.

Singapore

Based on the study conducted by Huang (2002), 100% of Singapore web sites contain their companies' names, images, and information of their products/services. The next most popular feature is online information exchange (26.8%) and the third in line is customer support (19.6%). For Singapore Web sites, the least likely purpose of the homepages is to achieve sales on the Internet (17.2%). The result indicates that trading activities on line had not fully bloomed in Singapore. Companies set up homepages mainly to publicize the companies and their images, rather than to take advantage of the profit-enhancing activities available on the Web. The Internet security issues and customer preference of old purchasing behaviors could be the reasons contributing to the lack of interest from most corporations in Internet sales.

Web in Singapore aims more at customer support and information exchange, whereas Internet sales are most emphasized by the Retail industry. There are a number of barriers that create difficulty for the consumer online retail business. One of the barriers is the fact that Asia does not have the same big base of installed personal computers. On average, there are 0.01 personal computers per person versus 0.40 in the U.S., according to IDC. Another barrier is the built-in habit of the users. There are shopping malls everywhere in Singapore and

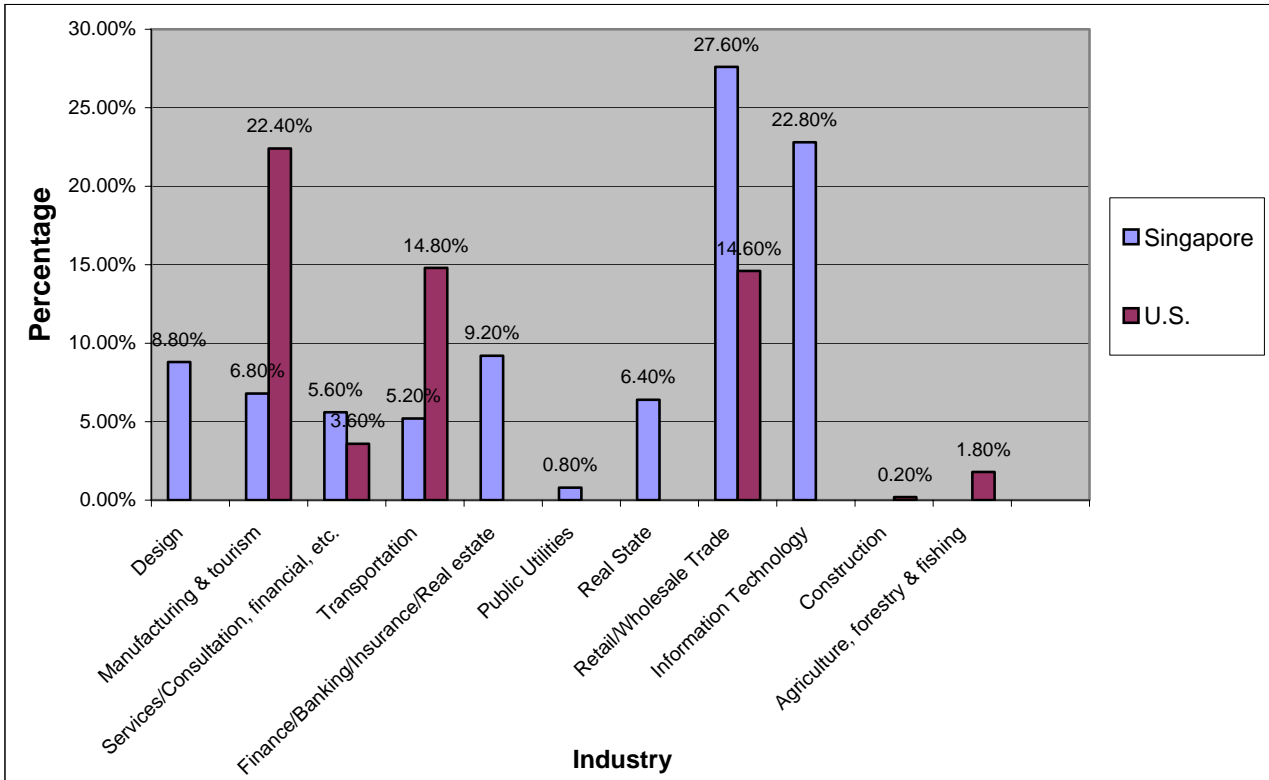


Figure 1: WWW Presence in Singapore and the U.S.

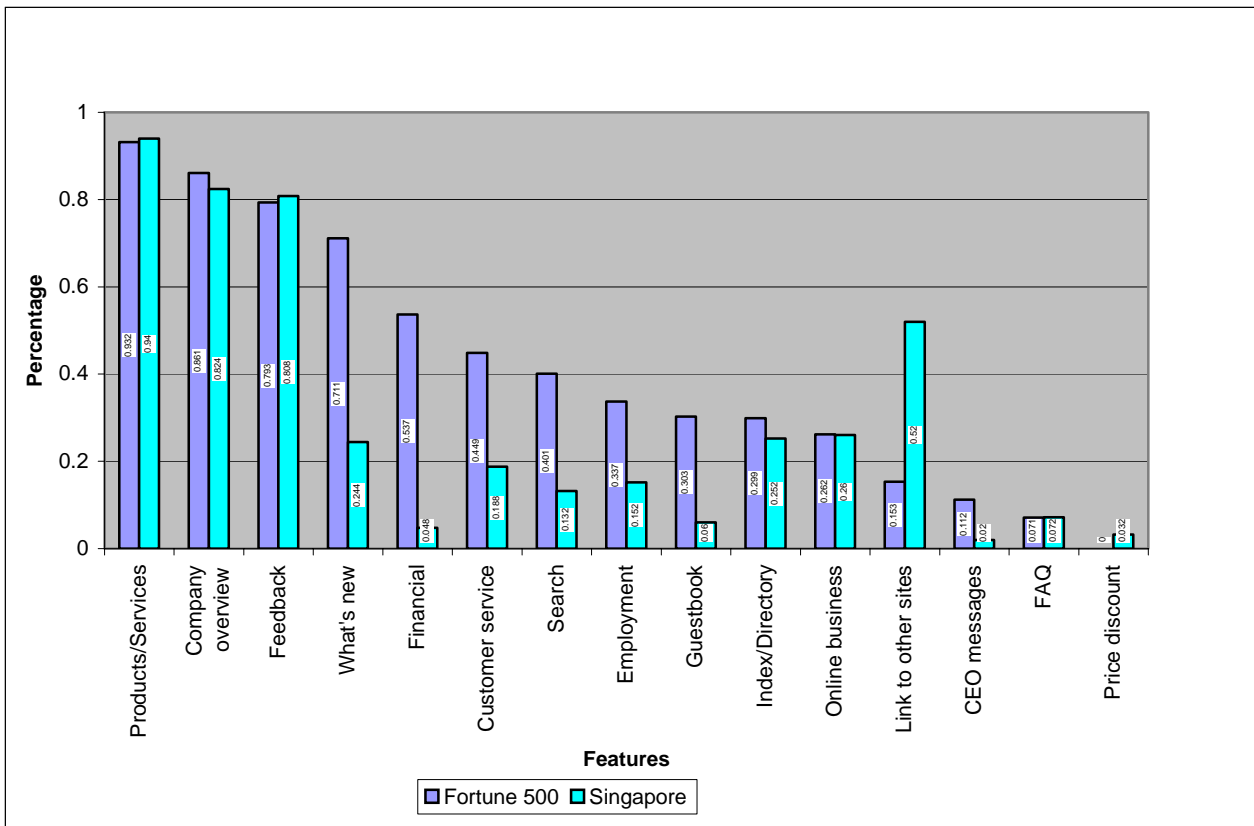


Figure 2: Web Features in Singapore and the U.S.

consumers generally like to feel and touch the products, try and test them out and compare the prices prior to purchasing them. Furthermore, a big concern is the use

of credit card online. Even though more people are spending time online, when it comes to purchasing, they are still reluctant due to concerns over the security of

credit card purchases and personal information. The problem with using credit card online has been addressed by a verification service however, called "Verified by Visa", where customers use personalized password to serve as an additional verification point. When they buy something from a website that is "Verified by Visa", they are given access by entering their password as at ATM machines.

Figure 2 provides a comparison of the frequency of features found on Web sites of the two different countries. On average, the top 3 features utilized on any Web site are products/services, company overview, and feedback, which reinforces the main purpose for corporations going online at this point, which is to reach a large market to promote acknowledgement of their products/services, and to pronounce the existence of the company. Feedback also allows the companies to get customers' ideas and opinions on how they are doing and what could be improved for them to better serve their customers. Other features are not uniform across the two countries. In other words, they are on websites of one country but not found as common on websites of another country. Customer service is also present on all websites but appears to be the lowest in Singapore, which indicates the fact that Singapore companies need to redesign their web site in such a manner that can provide customer services to the extent possible.

6. DISCUSSIONS AND IMPLICATIONS

Our cross-country comparison study indicated that on the usage of commercial web sites of corporations in the two different countries is different from each other, in terms of the three specific aspects, web presence in different industries, web features used in their web sites, and the relationship between corporation size and commercial web sites, etc. Corporations have spent millions of dollars in developing web sites for commercial purposes in the past years. Different ways of using commercial web sites would reflect different needs and characteristics of local businesses in the two countries. As a result, the one-size-fits-all method of designing and using commercial web sites may not work well when crossing national geographical boundaries and/or cultures. Therefore, when designing and developing commercial web sites and/or e-commerce systems for corporations in different countries, national culture could be an important factor to be considered in order to design a successful and effective commercial web site for corporations in another culture/country.

The majority of companies in Singapore and the Fortune 500 companies are using the Internet medium mainly for advertising purpose, to announce their existence rather than to generate revenue. However, they have all realized the huge potential provided by their Web

presence and have implemented strategies to attract more hits to their sites, as well as to generate more revenues from their Web presence. As far as the features on the Web sites, even though the companies are physically dispersed, their Web presences share fairly similar standards for content display. The features most frequently found on all websites across the two countries are Products/Services, Company Overview, Feedback and Customer Service. The percentage of their use may differ, i.e. Singapore has a low percentage on Customer Service compared to the Fortune 500; however, in general, they all mean to expose the companies to the public to promote knowledge of the company toward their products/services provided, as well as to enhance public relations, to reach global customers, and to get feedback from customers to improve the way they can do business and better serve the customers. Regardless of the fact that industries are classified somewhat differently across the two countries; however, the Retail industry seems to be the one with the highest Web presence in all, also the one that generates the most revenue from its web presence compared to other industries. Despite any drawback in the economy or concern over security on making purchases online, it is predicted that revenues generated by businesses conducted via the Web will be on the rise across the two countries, defining the new age of technology.

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