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ABSTRACT

With advances in the technology of web-based multimedia and increased availability of broadband Internet connections, websites rely on pictures and animation to convey subtle messages that are more effectively communicated non-verbally. We argue that such messages have strong cultural contents, which should be understood by website designers. We also argue that the fit between the cultural contents of web image(s) and the culture of the web visitor may increase the positive impact of a website. Hence, the focus of this paper is the exploration of the cultural contents of website images. In this phase of the research, we focus on the dimensions of power distance, individualism versus collectivism, and masculinity versus femininity. This investigation relies on the configural theory and semiology to argue for the existence of cultural contents in web images. In the first stage of this project, we use the grounded theory to identify signifiers of cultural contents in web images along three cultural dimensions. We categorize the cultural signifiers of web images for the three cultural dimensions and propose a conceptual model for the way the cultural fit in web images could increase website stickiness. The contributions of this paper are in the examination and identification of cultural contents of web images, and in the conceptual model building for identifying how cultural fit between web images and web visitors could increase website stickiness. Such knowledge could heighten our sensitivity to hidden cultural messages in websites and promote website designs that are more congruent with web visitors' culture and the intended overall message of websites. In this paper, we also propose the conceptual model for the second stage of this study in order to test the impact of cultural fit of images in website stickiness, which lays the foundation for future extension of this work.

KEYWORDS

Web image cultural fit, website stickiness, flow, semiology, configural theory

INTRODUCTION

According to International Data Corporation, currently 60 percent of the Web population resides outside the USA and is expected to generate about half of global e-commerce spending. Internet users surpassed 1 billion in 2005 across the world— up from only 45 million in 1995 and 420 million in 2000. By 2011 it is expected that there will be 2 billion Internet users. Internet user penetration is now in the 65% to 75% range for the leading developed countries with a predicted slow down in growth. Developing countries have penetration rate in the 10% to 20% range, which is expected to grow rapidly in the future (Computer Industry Almanac Inc. 2006). It is predicted that only one third of Web users will speak English as their first language (Crokett 2000). Hence, website designers need to have deeper understanding and insight about cultural signifiers of website contents in order to design effective websites that will be successfully used by web visitors. Recently, Zahedi, Van Pelt and Srite (2006) have used semiology in identifying the cultural signifiers of website documents. Semiology is the study of cultural sign. In semiology, signs have three aspects: signifier, signified, and signification (Ducrot and Todorov 1979). *Signifier* constitutes observable aspects, *signified* is the hidden aspect, and *signification* is the recurrent observed relationship between a signifier and a signified. We use semiology and apply an interpretive approach to identify cultural signifiers, signifieds, and significations in website images. This research focuses on cultural signifiers of website images and the possible contribution of cultural fit in web images in increasing the stickiness of websites.

Hence, this paper has two research questions. (1) What are (if any) the cultural signifiers of web images? (2) What is the possible role of cultural signifiers of web images in stickiness of websites? In answering the first question, we rely on the configural theory (Salinas 2000) and semiology (Ducrot and Todorov 1979) to conceptually argue that website images have cultural signifiers. We then use the constant comparison in the grounded theory and an interpretive approach to identify cultural signifiers of web images, and report the categories of signifiers in three cultural dimensions: masculinity-femininity, individualism-collectivism, and power distance. In answering the second research question, we first introduce "website

image culture fit" (WICF) and argue for the importance of cultural fit between website images and their potential visitors. We propose a theoretical model that explains how WICF could contribute to website stickiness, particularly for first-time visitors.

CULTURE RESEARCH IN INFORMATION SYSTEMS

There is abundant evidence of the importance of culture in IS success (Deans and Karwan 1997; Ives and Jarvenpaa 1991; Palvia 1998; Shore and Venkatachalam 1995). Volti (1992) observes that technologies developed and implemented in one culture may turn out to be a failure when taken to a different social setting. Fine (1998) cautions managers to be more sensitive to the effects of national business mores, values, standards, laws and cultures. Previous studies (Al-Khaldi and Wallace 1999; Cheung and Lee 2001; Straub 1994) also relate the challenges posed by various national differences, including culture, on elements of Internet use and commercialization. Dirksen (2001) notes that the universal applicability of IT is a "myth". Ein-Dor, Segev and Orgad (1993) list the national cultural factors in information systems. Rose and Straub (1998) use the TAM to compare perceived usefulness and actual use of computers across national borders, and conclude that cultural biases play a role in TAM when applied to PC use. McCoy, Everard and Jones (2005) and Srite and Karahanna (2006) examine the role of national culture on TAM using Hofstede Dimensions and find mixed results. Harris and Davison (1999) find considerable differences in PC involvement surveys across users in China, Hong Kong, Malaysia, New Zealand, Tanzania and Thailand, and attribute those differences in part to culture. Straub (1994) has studied the effect of culture on e-mail and FAX technologies in Japan, and the US, and has reported a considerable difference between the two countries. Even though there are researchers like McLeod, Kim, Saunders, Jones, Scheel and Estrada (1997) who note that the effects of culture on IT have not been consistent with Hofstede, there are others too who believe that national culture measured along the lines of Hofstede dimensions does impact IT and web design in particular. Tricker (1988) provides an excellent framework linking IS and culture using Hofstede's work.

Cultural studies of websites are more recent phenomena. Zahedi, Van Pelt and Song (2001) relying on Hofstede dimensions argue for the impact of web documents' cultural contents on website use. Luna, Peracchio and Juan (2002) argue that "cultural congruity" of a website's language (English vs. Spanish) and graphics with a visitor's culture lower the amount of "cognitive effort" required to use the website. Zahedi et al. (2006) identify the masculinity and femininity cultural signifiers of web documents. This paper extends the cultural studies of websites to (non-verbal) images used in websites, and attempts to identify cultural signifiers of web images and their possible role in increasing website stickiness.

Culture in Web Images

Culture is defined as "the collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede 2003: p.5). It is also defined in terms of rituals, heroes and symbols (Schein 1985). Luna et al. (2002) argue that language and its graphics are important cultural symbols. Zahedi et al. (2001) observe that web documents in the same language could have different cultural contents. Zahedi et al. (2006) identify cultural signifiers of web documents in the same language (English). We posit that content-free non-verbal images/pictures too have cultural contents and are arguably prime examples of hidden cultural artifacts.

Both the configural theory and semiology assert that images and symbols are more than mere objects; they highlight cultural phenomena and convey social meanings. Configural theory proposes that images are cultural artifacts (Lupton and Miller 1996; Salinas 2000). They contain ideologies and values, and convey "their maker's ethos" (Salinas 2000). The configural theory asserts that viewers of images are not passive, rather they actively participate in constructing and assigning cultural meanings to images (Johnson-Eilola 1997). Based on the configural theory, we propose that website images contain cultural artifacts that have social values and subtle cultural messages. The next question is how to manifest these subtle messages. We use semiology for this purpose.

As mentioned earlier in this paper, in semiology, signs have three aspects: signifier, signified, and signification (Ducrot and Todorov 1979). Applied to our study of website images, *signifier* constitutes those aspects of culture reflected in an image that could directly be observed (e.g., the gender of a person in the image or the number of persons in the picture), *signified* is the hidden cultural dimension under investigation (e.g., masculinity or individualism), and *signification* is the recurrent observed relationship between a signifier and a signified (e.g., the recurrent relation between gender of a person depicted in the picture and masculinity-femininity of the website). We apply the interpretive approach of the grounded theory to identify cultural signifiers, signifieds, and significations in website images.

RESEARCH METHODOLOGY

In identifying the cultural signifiers of website images, we use the constant comparison approach in the grounded theory. Grounded theory is defined as "the discovery of theory from data" (Glaser and Strauss 1999: p. 1) and involves an iterative process between data collection and analysis through contrasting and comparing findings at each stage with those of the next. We deployed the grounded theory approach in an interpretive manner. Hofstede (2003) identified five cultural dimensions, of which we have focused on three cultural dimensions as signifieds: masculinity-femininity (Mas-Fem), individualism-collectivism (Ind-Col), and power distance (PD) for the first round of data collection and signifier identification. The data consists of main images in home pages from websites of countries with contrasting scores in Mas-Fem, Ind-Col, and PD.

Hofstede (2003) reports cultural scores for 53 countries. In selecting the countries for constant comparative study, we categorized countries into high and low in each of the three dimensions. The *high* category in one dimension is assigned to the countries that are in the top 33 percentile (score wise) in that dimension. Similarly the *low* category is assigned to countries that fall in the bottom 33 percentile in the respective dimension score. We then identified those countries which appear in all the three categories i.e. masculinity (Mas-Fem), individualism (Ind-Col) and power distance (PD) as either low or high. We identified five countries which consistently appear as either high or low in all of these three dimensions. Five such countries are Mexico, Great Britain, Yugoslavia, Costa Rica and Sweden. We also included USA and Japan as well because their websites also exhibited similar polarities (Table 1). Note that not all combinations of high and low (in top and bottom 33 percentiles) exist in the list of 53 countries.

Country	Masculinity	Individualism	Power Distance
Great Britain (UK)	High	High	Low
Sweden	Low	High	Low
Costa Rica	Low	Low	Low
Yugoslavia	Low	Low	High
Mexico	High	Low	High
USA	Medium-to-High	High	Medium-to-Low
Japan	High	Medium	Medium

Table 1. Cultural dimensions of the selected countries

Website Selection

We chose websites from these countries that were clearly originated from the country and were designed mostly to serve the audience within the country (universities, hospitals and banks). To ensure that the website represents the country's culture, we chose websites in the native language of the country. Our constant comparative analysis led to the collection of 136 websites for the above mentioned countries. We also considered two news Swedish websites because they appeared to be particularly interesting. The images were collected from the homepage of each website that were not associated with any particular verbal aspect of the website (such as links or associated with a given story) and were to convey an overall impression of the website. We have searched for the websites using the Google search engine specific to that country. Table 2 reports the number of images in each category and country.

We contrasted images from countries that varied only in one dimension, compared images from countries that varied in two dimensions, and also contrasted images from countries which exhibited extreme polarities on all three dimensions.

Country	Universities	Hospitals	Banks	Others	Total
Great Britain (UK)	9	4	6		19
Sweden	9	4	3	2 (news)	18
Costa Rica	7	6	4		17
Yugoslavia	5	9	8		22
Mexico	6	6	6		18
USA	6	8	6		20
Japan	9	6	7		22
Total	51	43	40	2	136

Table 2. Data Sources for Website Images

FINDINGS

Masculinity and Femininity

Hofstede defines the cultural dimension of Masculinity versus Femininity as follows: "masculinity pertains to societies in which social gender roles are clearly distinct (i.e., men are supposed to be assertive, tough, and focused on material success whereas women are supposed to be more modest, tender and concerned with the quality of life); femininity pertains to societies in which social gender roles overlap, (i.e., both men and women are supposed to be modest, tender, and concerned with the quality of life)" (Hofstede 2003, p.82). Table 3 contrasts the signifiers of masculinity and femininity that we have identified through constant comparative analysis.

Masculinity	**Femininity**
Humans in mages	**Humans in mages**
• Mostly men in pictures • Men are authority figures • More frequent non-smiling faces • When women in picture, they are posed, single with little authority	• Mostly females in pictures • Females are shown in positions of authority • Females are shown in the same rank as men • More frequent smiling faces • Family is shown (husband-wife, children) • Relationship is shown (communication) • Higher cases of natural, relaxed, holiday impression
Focus	Focus
• Focus mostly on male(s)	• Focus mostly on female(s) • Focus on babies and children
Dress	Dress
• Men are in formal attire and women in casual dresses	• Women are more formally dressed
Overall color	Overall color
• More black and somber colors	• More pink and other bright colors
Use of tools	Use of tools
• Man has the power tool • If woman is shown with a power tool, she is merely posing	• Woman has the power tool
Non human objects	**Non human objects**
Buildings / Structures	Buildings / Structures
• Solid man-made (artificial) structures • Buildings of somber colors • Buildings are solid	• Sketch of buildings or houses • Buildings have more bright color
Other Objects	Other Objects
	• Cartoons, funny characters • Natural landscape, flowers and river • Artistic and funny drawings, mostly with bright colors

Table 3. Masculinity Versus Femininity

As can be seen in Figure 1, the signifiers of masculinity are: focus on men, men in authority, men with a power tool and men in formal or professional attire. The signifiers of femininity are: focus on women, women in either authority or with a power tool, and women in formal or professional attire. We have found exceptions in UK, which is scored high in masculinity, but there are fewer instances of masculine signifiers in UK images.

Figure 1. Examples of Femininity and Masculinity Dimensions in Human Images

In non-human images, as shown in Figure 2, the masculinity is most often signified by strong, man-made structures, whereas there are a variety of non-human objects, such as funny objects, cartoons, natural landscapes, and artistic visuals as femininity signifiers.

Figure 2. Examples of Femininity and Masculinity Dimensions in Non-human Images

Power Distance

Power distance is defined as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede 2003: p. 28). The constant comparative analysis of images from high and low power distance countries revealed a number of power distance signifiers, shown in Table 4. The most frequent signifier of high power distance is a single person in an authority position, gesture, attire, and at a distance from others. Since high power distance normally is accompanied by collectivism, the collectivism signifier (group of people) is also depicted in the image. On the other hand, images from low power distance websites show no single person in the position of authority or focus over the others, humans' poses are mostly casual and relaxed. If shown as a group, people are not engaged in seemingly important tasks. Figures 3 and 4 show examples of the images for high and low PD.

High Power Distance	Low Power Distance
Humans • Person in the image is in the position of authority • In a group, one person is depicted to have power above others • The pose is formal • Facial expressions and gestures depict power • Direction of gaze by people • There is a physical distance between the person of authority and others • A hierarchical structure is depicted Dress • Formal or professional attire Focus • Focus on one person (male or female)	**Humans** • No single person is in the position of authority • In a group, no single person has power over others • If a man is in authority, he is in background • The pose is casual • More often, no human full figure is shown • In a group, people do not seem engaged in important tasks • No hierarchical structure is depicted Dress • Casual attire Focus • No focus on any one person
Non human objects: • Buildings have grandeur • Building are tall • Grand structures with full perspective and sky • High clouds, height of the buildings, columns of buildings • Trees have grandeur	**Non human objects:** • Building have no grandeur • Building have little light, artificial • Landscape is natural • All cartoons are depicted as equal

Table 4. Signifiers of Power Distance in Web Images

Figure 4. Examples of Power Distance Dimension in Non-human Images

Non-human objects mirror the same hierarchical structure as the signifier, in such a way that a single object (such as fountain or tree) is shown to be at a higher position or focus than the others. Grand buildings with full perspective in daylight are also signifiers of high power distance.

Individualism and Collectivism

According to Hofstede, "Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism, as its opposite, pertains to societies in which people from birth onwards are integrated into strong, cohesive groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty" (Hofstede 2003: p. 51). Our findings regarding the signifiers of individualism and collectivism are reported in Table 5. Figures 5 and 6 show examples of web images for the individualism and collectivism dimension.
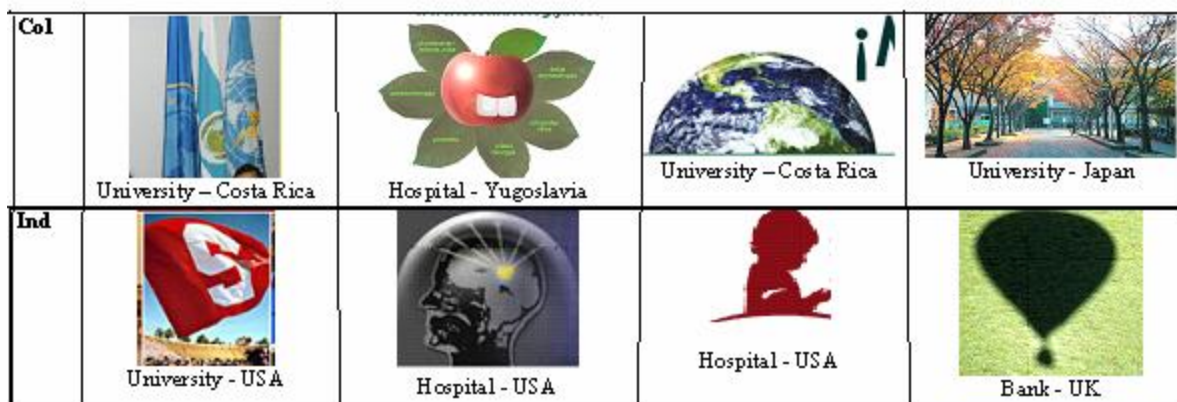
Individualism	**Collectivism**
Humans • Single person is shown Focus • When many people are shown, the focus is only on one individual Attitude • Even when multiple people are shown, they are not communicating, they look in different directions.	**Humans** • Groups of people are depicted • Family is emphasized Focus • Multiple people are shown Attitude • People are shown as gazing in same direction • People are shown working on a common task • People are shown interacting, competing, walking together.
Non Human Objects Single object is depicted in most images: • Single tree is shown. • When a number of trees is shown, focus is only on one tree	**Non Human Objects** The objects are shown in multiple, such as: • Multiple fountains • Multiple leaves • Multiple flags • Globe as collectivist object • Multiple funny objects

Table 5. Signifiers of Individualism and Collectivism in Web Images

Figure 5. Examples of Individualism and Collectivism in Web Images

Figure 6. Examples of Individualism and Collectivism for Non-human Images

The single most frequently observed signifier of individualism and collectivism in web images is the number of persons or objects in the picture. In individualism, normally one single person is depicted in the image. Furthermore, in collectivism, people in the image interact, communicate, or gaze in the same direction. On the other hand, when more than one person is shown in individualism (e.g., two individuals), they pose as though they are two separate units, which do not interact, communicate, or gaze in the same direction (as shown in Figure 7). Non-human objects also have the same presentation. In individualism, single objects are depicted, whereas in collectivism, objects are normally in groups (such as multiple trees, flags, leaves, and fountains).

Figure 7. Examples of the Lack of Communication in Individualism Images

Contrast among Multiple Dimensions

In the constant comparative analysis, we made every effort to isolate signifiers for a given dimension by pairwise comparisons of countries that varied across one, two, and three dimensions. However, there are cases when the two dimensions show up together, such as collectivism and high power distance. Furthermore, combinations of dimensions at times exaggerate or lead to interesting results. For example, high power distance and femininity reinforce one another and lead to more exaggerated feminine signifiers in the web images. On the other hand, masculinity and power distance exaggerates the masculine depictions in the images. Contrasting dimensions produce interesting images. For example, Yugoslavia with high femininity and high power distance has unusual images of female power, as shown in Figure 4 as well as Figure 8.


Figure 8. Example of Yugoslavia's Contrasting Dimensions

Based on these findings, we conclude that web images contain cultural signifiers and these signifiers could be manifested through the comparisons of websites of countries with opposing cultural dimensions. In the next section, we use cultural signifiers of web images to formulate a theoretical model for investigating how the cultural contents of web images could impact website stickiness.

IMPACT OF CULTURAL CONTENTS OF WEB IMAGES

In the online world, where there are so many distractions around, websites need to have stickiness if they are to attract visitors and potential customers an users. Website stickiness has been defined in a number of ways, including the customer's willingness to spend time on the website, to return to the website, and to make more purchases from the website (Luna et al. 2002). In this study, we focus on websites' first impression and the visitors' willingness to stay with the website to explore its contents instead of leaving it immediately. We argue that the fit between cultural signifiers of web images in a website and the culture of its web visitor (web image cultural fit or WICF) will lead to increased stickiness of the website in the web visitor's first encounter with the website. We argue that the reason for the positive impact of cultural fit on website stickiness is that the fit increases enjoyment, promotes positive feelings, and enhances focus, as shown in Fig-9.
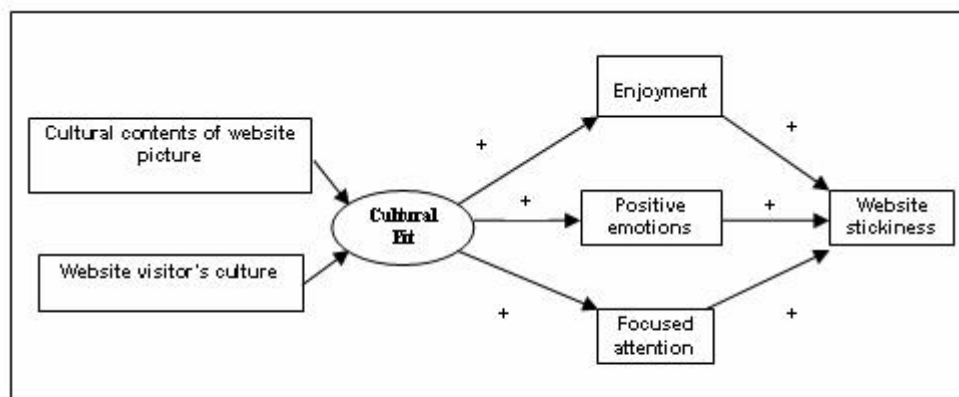
Figure 9. Website Image Cultural Fit and Stickiness Model

WICF promotes a sense of familiarity and social connectivity that contributes to the feeling of relaxation and control by the web visitor. Csikzentmihalyi (1977) in his flow theory explains that when challenges go down, the feeling of relaxation and control increases. Visiting an unfamiliar website for the first time requires an alertness that burdens the cognitive capacity of the visitor. Since the cultural fit could promote a sense of familiarity, it could reduce the first-time visitor's anxiety and promote a sense of control and relaxation, which are positively associated with enjoyment and positive feelings. Hence:

Proposition 1: The cultural fit between the culture of web pictures and the culture of web visitor is associated with increased enjoyment.

Preposition 2: The cultural fit between the culture of web pictures and the culture of web visitor is associated with positive emotions.

Attention theories (e.g., Broadbent 1958 and Kahneman 1973) view attention as a capacity. Kahneman's (1973) limited capacity model of attention portrays that there is a central processor that allocates attention. Central capacity theory argues that users' "attentional resources are limited and multiple tasks will compete for the available attention" (Hong 2001: p.105). In this scenario, cultural fit between the cultural contents of the web images and the cultural of the web visitor will not cause any undue mis-interference and hence will not vie for any additional attention, thus adding to the sum total of "attentional" resources available at the users' discourse. Hong (2001) in his study of the effect of flash on brand recall found that when attentional resources are spent on suppressing the interference effect of flash (read as non-congruent object), there were fewer resources available for information processing of the brand names. This leads us to proposition 3, which is stated as:

Proposition 3: The cultural fit between the culture of web pictures and the culture of web visitor is associated with increased focused attention.

Based on the flow theory, we argue that the experience of enjoyment and positive feelings about a website creates incentive to stay longer on the site and explore its contents, since enjoyment and positive feelings are optimal states, which the visitor may wish to prolong. Hence,

Proposition 4: Enjoyment is associated with web stickiness.

Proposition 5: Positive emotions are associated with web stickiness.

Focused attention refers to a "centering of attention on a limited stimulus field" (Csikzentmihalyi 1977: p. 40). Focused attention leads to telepresence, which is the perception that the virtual environment with which one is interacting is more real or dominant than the actual physical environment (Hoffman and Novak 1996). Telepresence, in turn, is associated with enhanced website usage (Novak, Hoffman and Yung 2000; Shih 1998). Hence:

Proposition 6: Focused attention will lead to web stickiness.

CONCLUSION AND FUTURE EXTENSIONS

The empirical study of web images provided support for the existence of cultural signifiers in web images, which addressed the first research question. In answering the second research question, we argued for the web image cultural fit construct and relied on the flow theory to propose a conceptual model, which describes how web image cultural fit could enhance the stickiness of websites for first-time visitors. The next step of this exploration is testing the model under controlled lab experiments to investigate the circumstances under which cultural fit could have a significant impact on website stickiness. The empirical investigation of the model will involve the development of numerous websites with various cultural signifiers in their web images, while keeping other aspects of websites relatively constant. Potential visitors with varied cultural backgrounds will be exposed to the stimuli under controlled conditions.

The contribution of our work is in its focus on cultural signifiers of web images. To our knowledge, there has not been any precedence in studying web images to identify how cultural dimensions are signified. Our work identifies cultural signifiers. Furthermore, our conceptual model makes it possible to test the efficacy of using cultural fit of web images for designing culturally-aware websites. As the numbers of websites and web visitors increase across the globe, such knowledge will be of great importance for whose who rely on the web for the survival of their business.

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