### Wei-Shang Fan<sup>1</sup>

# THE EFFECTS OF PERCEIVED AVAILABILITY AND INFORMATION QUALITY ON WEBSITE: MEDIATION OF CUSTOMER KNOWLEDGE MANAGEMENT AND FLOW EXPERIENCE

This research aims to construct the factors influencing website shopping effects and identify the effect that attract consumers to a website and build customer loyalty. The research uses SEM (structure equation model) to establish an integrated cause-effect relationship model to confirm the influences of customer knowledge management and flow experience as key drivers of the website effect. The findings confirm that all 4 variables positively influence website and the validation results show that the overall model fit criteria and internal structure fit both reached criteria indicating that the theoretical model is supported. From a practical perspective, this research shows that the website design should focus on customer knowledge management and create flow experience to attract consumers to browse. In addition, websites must provide an information integration set, and allow users search for information at once, satisfy their needs, and overcome information anxiety. Keywords: customer knowledge management; website perceived availability; information quality; flow experience.

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# ВПЛИВ СПРИЙНЯТТЯ ДОСТУПНОСТІ І ЯКОСТІ ІНФОРМАЦІЇ НА ВЕБ-САЙТІ НА УПРАВЛІННЯ КЛІЄНТСЬКИМ ЗНАННЯМ І ПОТОКОВИМ ДОСВІДОМ

У статті вивчено чинники, які впливають на онлайн-шопінг, і визначено чинники, що залучають споживачів на веб-сайт і зміцнюють лояльність клієнтів. Використано модель структурного рівняння для розробки інтегрованої моделі причинно-наслідкових залежностей, щоб підтвердити, що вплив на управління клієнтським знанням і потоковим досвідом є основним чинником успішного веб-сайту. Результати дослідження підтвердили, що всі 4 змінні позитивно впливають на веб-сайт, а перевірочні результати показали, що загальні критерії придатності моделі і придатності внутрішньої структури досягають рівня, за якого теоретична модель підтверджується. З практичної точки зору доведено, що при розробці веб-сайту необхідно сконцентруватися на управлінні клієнтським знанням і створенні потокового досвіду для подальшого стимулювання пошуків по сайту. До того ж, сайти повинні надавати пакет інтегрованої інформації і дозволяти користувачам миттєво знаходити інформацію, задовольняти їх запити і долати інформаційне занепокосння.

**Ключові слова:** управління клієнтським знанням; доступність веб-сайту; якість інформації; потоковий досвід.

#### Вей-Шан Фан

# ВЛИЯНИЕ ВОСПРИЯТИЯ ДОСТУПНОСТИ И КАЧЕСТВА ИНФОРМАЦИИ НА ВЕБ-САЙТЕ НА УПРАВЛЕНИЕ КЛИЕНТСКИМ ЗНАНИЕМ И ПОТОКОВЫМ ОПЫТОМ

В статье изучены факторы, влияющие на онлайн-шоппинг, определены факторы, привлекающие потребителей на веб-сайт и укрепляющие лояльность клиентов. В исследовании используется модель структурного уравнения для разработки интегрированной модели причинно-следственных зависимостей, чтобы потдвердить,

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что управление клиентским знанием и потоковым опытом - основа успеха веб-сайта. Результаты исследования подтверждают, что все 4 переменные положительно влияют на веб-сайт, а проверочные результаты показали, что общие критерии пригодности модели и пригодности внутренней структуры достигают уровня, при котором теоретическая модель подтверждается. С практической точки зрения доказано, что при разработке веб-сайта необходимо сконцентрироваться на управлении клиентским знанием и создании потокового опыта для дальнейшего стимулирования поиска по сайту. К тому же, сайты должны предоставлять пакет информационной интеграции и позволять пользователям мгновенно находить информацию, удовлетворять их запросы и преодолевать информационное беспокойство.

**Ключевые слова:** управление клиентским знанием; доступность веб-сайта; качество информации; потоковый опыт.

**Introduction.** The rapid development of the Internet has created new economics and online shopping has become a key element of business operations; and therefore, greater understanding of how companies can add value to consumers through their websites is vital. Surveys show that the Taiwan B2C online shopping market was worth NT\$ 245 bln. in 2010, and it grows at the compounded annual growth rate of 32.9%. Therefore, how can businesses use the knowledge to effectively grasp consumers' needs and respond to marketing dynamics of competitors to maintain a competitive advantage? How should website operators design shopping websites, so that they can attract the attention of consumers and get them buy products? How can business change visitors into shoppers and then shoppers into loyal customers?

In recent years, the concept of customer knowledge management has received a high level of acceptance in business and academia. In business, the concept has emerged from earlier concepts of knowledge management, marketing orientation and CRM in order to provide more services and gain support from the Internet users, the examples of new functions include Open-find's e-clip function, Sian's periodical search function, and PChome Online's image search function. As for academia, Ansari and Mela (2003) found that customized knowledge management, provided by businesses can raise the flow experience of customers when browsing a site, concluding that this will increase website effect for businesses' websites. Some researchers studied preexisting factors and performance (business effectiveness) and some focused on the execution of market orientation (behavioral aspect) or cultural aspect (Fang and Salvendy, 2003).

Based on the above-mentioned research background, the purpose of this study is to investigate the significant factors used by customers in online shopping to select online shoppers, it includes: (1) to reorganize more comprehensive customer knowledge management from the related literature, and validate if consumers are willing to browse websites or make purchases; (2) Han, Kim, and Srivastava (1998) stated that a direct cause-effect relationship between Internet customization and website effect may be established through moderating variables in the environment and other intervening variables.

#### Literature Review and Research Hypothesis.

1. Website effect (WE). The development of websites has gradually entered the mature stage and the study of the success of information systems is no longer limited

to the internal information systems of businesses. The research of Seybold (1998) on the measurement of website effect showed that the key factors included the following: the business procedures to benefit customers; providing meticulous after-sales service; providing personalized service; and appropriately managing social groups.

Another factor to measure the website effect is word-of-mouth. Online word-of-mouth not only provides customers with more diverse information search channels, but also recognizes customers' potential needs and thoughts on the products (Hennig-Thurau et al., 2004). Word-of-mouth communication can influence customers' short-term and long-term purchase decision-making, it is the most informal yet critical communication channel for consumers (Herr et al., 1991; Bone, 1995; Gleb and Sundaram, 2002; Srinivasan, Anderson & Ponnavolu, 2002).

2. Information quality (IQ). Many studies indicate that website information content is actually the key factor of website operation (Angehrn, 1997; McCarthy, 1995; DeLone and McLean, 2003). Excessive and complicated global super-media content is the reason for tiredness recognized by online users (Gygi, 1990). Novak et al. (2000) suggested that providing complete information could lead to more consumer purchase decision-making benefits, but also increase price competition. Lynch and Ariely (2000) also suggested that although providing information of high quality could reduce consumers' information search costs, but it increases price sensibility.

Huizingh (2000) divided website content into information, transaction and entertainment, all be measured objectively. "Information" included business and non-business information. Business information was useful to consumers and further divided into corporate background information and product information. Nowadays, many companies strengthened customer relations by providing useful information or links to customers. By using web-storefronts to directly contact consumers, websites are a communication media which can provide animated, visual, messages, and should provide entertaining content. In other words, they should provide information and entertainment to online consumers.

Based on the above, this research makes the following hypothesis:

- H-1: There is a positive association between website information quality and website effect.
- 3. Perceived availability (PA). Moon and Kim (2001) applied the technology acceptance model to the use of WWW, and treated user-friendliness and usability as factors influencing consumers' attitudes to the Internet. The following studies not only applied TAM to different information systems to validate the models, but also involved some constructs or external variables to explain users behavior (Lim and Dubinsky, 2005). In contrast to traditional physical stores, more precisely explanation refers to the actual purchases, Childers et al. (2001) emphasized the website users normally pay considerable attention to the convenience of the website interface, the level of personalization of a website, and the ability to perform customized searches.

In order to establish a successful website system, system usage is the key product in satisfying website users, including consumer confidence, system management and control, easy and convenient use, online order status tracking, and website users' privacy (Liu and Arnett, 2000). Past studies have concluded that without the ability to track online transaction status, consumers would not use online auction and payment functions, Allen (1996) argued that consumers should be able to trust the system and

use online transaction, feel that the system was under their control, and that they could easily use it. Novak (2000) also indicated that customers emphasized website user-friendliness when shopping online.

Based on the above, this research makes the following hypothesis:

- H-2: There is a positive association between website perceived availability and website effect.
- 4. Customer knowledge management (CKM). Customer knowledge management refers to the interface channel and environment through which a user and a computer exchange information, in order for a user to view, search and input information. In addition, transmitting and sharing customer intelligence to the relevant departments inside and outside the business and responding to customer needs, leads to creating higher customer value takes can influence the user's observations and understanding of the system's functions (DeLone and McLean, 1992). If businesses want to successfully promote their e-stores, they must let consumers browse for relevant product and service information, and further share their personal experiences, opinions, and related knowledge.

Based on the above, this research makes the following hypothesis:

H-3: There is a positive association between customer knowledge management and website effect.

A good interface can allow users navigate more easily, avoid errors, and provides help at the right time (e.g., Nielsen, 1996). Therefore, this research suggests that website information quality and system quality should accomplish customer knowledge management by technologies specific to the Internet, including links to quality websites, customized search function, high-speed access, easily correctable errors, and website transaction security. In terms of its design, a website must spark the interest of customers, raise the participation and desire of customers, and attract customers to use the website. It must also be visually appealing to attract customers and ensure the goal of enjoyable flow experience (Liu and Arnett, 2000).

Based on the above, this research makes the following hypothesis:

- H-4: There is a positive association between website information quality and customer knowledge management.
- H-5: There is a positive association between website perceived availability and customer knowledge management.
- H-6: There is a positive association between customer knowledge management and flow experience.
- 5. Flow experience (FE). Flow experience is a kind of temporary and subjective experience and it allows people to do what they want to do according to their inner desire (Csikszentmihalyi, 1990; Webster et al., 1993). Mathwick and Rigdon (2004) pointed out that, when it comes to browsing the web and online search activity, individual perception factors are an antecedent to the user's flow experience when navigating a particular site. In practice, businesses use electronic mail, e-bulletins, business databases and multiple chat rooms to get relevant information on existing customers and potential customers. Therefore, they can avoid information omission and enhance the user's flow experience (Kanter, 1999).

Huizingh and Hoekstra (2003) studied website effect according to the characteristics of consumers and websites, and found that flow experience would influence

consumers' perception on website effect and affect the relationship between website use characteristics and website effect. Given the wide variety of video and audio content that can be incorporated into multimedia blogs, if content can be designed to be useful and to attract the interest of potential users, then web users are more likely to become immersed in the blog and enjoy the experience of using it (Finneran and Zhang, 2005; Choi, Kim and Kim, 2007; Saade, 2007).

Based on the above, this research makes the following hypothesis:

- H-7: There is a positive association between website information quality and flow experience.
- H-8: There is a positive association between website perceived availability and flow experience.
- H-9: There is a positive association between customer knowledge management and flow experience.
  - H-10: There is a positive association between flow experience and website effect. **Research method.**
- 1. Research Framework. The main goals of this research are to determine whether or not PA has a significant positive influence on WE, CKM, and FE; whether or not IQ has a significant positive influence on WE, CKM, and FE; whether or not FE and CKM have a significant positive influence on WE. The research framework uses a structure equation model to establish an integrated cause-effect relationship model to confirm the influences of customer knowledge management and flow experience as shown in Figure 1.

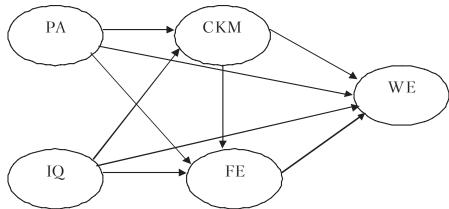


Figure 1. Research Framework

- 1. Definition and Measurement of Variables. The variables of this research are PA, IQ, CKM, FE and WE. The definitions, measure indicators and reference of each variable are compiled in Table 1.
- 2. Questionnaire distribution and return. Keeney (1999) argued that to find the value of Internet shopping for customers, the best method is to directly ask customers, based on this view point, this questionnaire was designed to have the subjects answer questions on the shopping website they most frequently visit. The researcher used the broadband users of Taiwan's largest telecom provider as subjects, and selected 200 subjects by simple random stratified sampling from each of the 3 service locations,

Northern, Central and Southern. A total of 600 questionnaires were distributed, and 287 were returned. After eliminating 44 incomplete questionnaires, there were 243 valid questionnaires; a valid return rate was 40.5%.

Variables	Observation index	definitions	Measure indicators	Reference
PA		Assessing website users' evaluation on system use: • Easy to use • Management and control of system • Confidence of system use • Users' privacy	P101 The payment process is easy to manage when making transactions on the website P102 The website can guarantee the success of your transaction P103 The transaction process of the website is reliable P104 The website can guarantee the confidentiality of your privacy	• Liu and Arnett (2000) • Srinivasan, Anderson & Ponnavolu (2002) • Aladwani (2002) • De Lone & McLean (2003)
IQ		Assessing website users' satisfaction with information provided by the website  • Correctness  • Reliable criterion  • Frequent update	P201 Acquire precise and reliable information or new functions on the website P202 The website information provides reliable objective descriptions P203 The reference and figures provided by the website are updated regularly.	• Novak (2000) • Lynch and Ariely (2000) • Huizingh (2000)

Among the subjects, there were 131 females, 112 males; 124 were single (51.0%); most of them were college or university graduates (72.4%), 23.9% of them had master degrees, 3.7% of them had high school or vocational school degrees; 7.0% of them were under 20 years of age, 36.2% were between 21 to 30 years of age, 17.7% were between 31 to 40 years of age, 29.2% were between 41 to 50 years of age, and 9.9% were over 51 years of age; 9.5% of them worked in manufacturing, 30.9% in service industry, 24.3% in military, civil services or education, 27.6% were students, and 7.7% were others.

#### Results and Analysis.

- 1. Model fitness analysis. The analytical result of the overall model fit of this research is shown in Table 3. The evaluation result of the internal structure fit and overall model fit indexes of the theoretical model were above the standard, which showed adequate fit of the theoretical model in this research.
- 2. Discussion on intervening effect. Baron and Kenney (1986) argued that the socalled total intervening effect means that, through intervening variables, the direct correlation between independent variables and dependent variables is insignificant. Partial intervening effect means that through intervening variables, the correlation

between independent variables and dependent variables becomes less significant. The analytical result in Table 3 showed that customer knowledge management and flow experience have partial intervening effect between website information quality and website effect, and the value was  $0.191 \left[ (0.28 \times 0.30) + (0.63 \times 0.17) \right]$ . The direct effect between website information quality and website effect was 0.3, and thus the total effect was 0.491. Moreover, customer knowledge management showed partial intervening effect between perceived availability and website effect, and the direct effect was 0.2. The indirect effect was  $0.34 \times 0.30 = 0.102$ , and the total effect was 0.302. The empirical data showed that customer knowledge management and flow experience could increase the website effect, which demonstrated the importance of design quality and flow experience of the website.

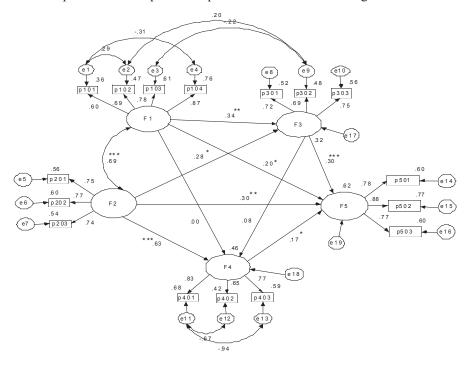
Table 2. Operational definitions, survey questions and reference of e-CKM, flow experience and website effect

Variables	Observa- tion index	Operational definitions	Measure indicators	Reference	
CKM		Assessing website users' attitude to website customer knowledge management functions:  • Learning  • More effectively  • Share personal experiences, opinions and knowledge.	P301. The customer knowledge design provides learning links P302. The customer uses the knowledge management to acquire a product or a service more effectively. P303. The consumers browse for relevant product and service information, and further share their personal experiences, opinions, and related knowledge.	• Newman and Landay (2000) • Palmer & Griffith (1998) • Huizingh (2000)	
FE		Assessing if the website effect is influenced by flow experience:  • If it can help users to enjoy browsing the website.  • If it can result in users' interest in the website  • If it can result in users' concentration	P401. Browsing the website is an enjoyment P402. Interested when browsing the website P403. Browsing the website will make you concentrate	• Ghani & Deshpande (1994) • Webster et al. (1993) • Huizingh & Hoekstra (2003)	
WE	Attraction		P501. The website is relatively attractive	• Liu and Arnett (2000) •Hennig-	
	Reliability		P502. The website is the best way to acquire correct information	Thurau et al. (2004) •Rosenoer, Armstrong & Gates (1999)	
	Online word-of- mouth		P503. Actively recommend this website to others on the Internet		

•							
Fit index	Judgment principle	Research framework model					
Chi-square (CMIN)	The smaller the better	182.86					
DF		88					
P	Not significant	0.000					
CMIN/DF	<3	2.078					
RMR	< 0.05	0.027					
RMSEA	< 0.08	0.067					
GFI	>0.9	0.91					
AGFI	>0.9	0.87					
NFI	>0.9	0.90					
CFI	>0.9	0.95					
PNFI	As least 0.5	0.59					
PGFI	At least 0.5	0.66					

Table 3. The analytical result of the overall model fit

The path relationship test and path results are shown in Figure 2 as below:



Note: F1=perceived availability; F2=information quality; F3=customer knowledge management; F4=flow experience; F5=website effect \*\*\*  $(\alpha < .001)$  \*\*  $(\alpha < .01)$  \*  $(\alpha < .05)$ 

Figure 2. The analytical result of the structural model path

**Discussion and implications**. This research found that the website effect can be strengthened through customer knowledge management, information quality, and system use. It confirmed the cause-and-effect relationship among website perceived availability, information quality, customer knowledge management, and flow experience and website effect by linear structural relation model. The fitness test result

showed that the overall theoretical model fit of this research met the test standard, and demonstrated that the theoretical model of this research was supported.

The research showed that the website perceived availability can directly and positively influence design quality and website effect. That is to say, the higher customers' perception toward website system use is, the higher their perceived evaluation toward design quality and website effect. Through design quality, it indirectly influenced website effect. Website information quality can directly and positively influence design quality. It implies when the function of website information quality is more powerful, customers' evaluation of customer knowledge management will be higher. Design quality and flow experience can directly and positively influence website effect. In other words, when customer knowledge management and flow experience are higher, website effect is more likely to increase. The result showed that the function to upgrade website technology and operation can show more diverse website effect, so that the website will be more attractive and reliable to customers. Thus, in order to increase the website effect, website operators should not only strengthen website quality, but also directly increase the website effect via CKM and flow experience.

Moreover, during the interaction, a company can learn about its customers' views on the products. Also, through community building and continuous communication, customers' positive experience can be established and corporate image can be upgraded.

**Conclusion.** In order to attract consumers to a website, a website should provide effective information and completely fulfill the characteristic of website interaction. This demonstrates that the validation result of this research is consistent with the measures and analysis. Evans and Wurster (1999) also advocate the elaboration of web navigation strengthens the effectiveness of web operation. Nevertheless, the CKM of a website may attract online browsers more effectively than personalized websites (Nunes and Kambil, 2001).

Finally, online selling channels and online marketing are conducive to potential buyers and marketing personnel. This research only analyzed the characteristics of websites. In future, researchers can further explore the results of the Internet operations caused by the influences of the variables of marketing functions, such as advertising, promotion, and the Internet community, on purchase intention.

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