A Unified Model of Web-Based Shopping Systems Diffusion

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Abstract

Although the research on electronic commerce is plentiful, there is little empirical research related to Web-Based Shopping Systems (WBSS). This is especially so in global electronic commerce circumstances. WBSS are the fastest growing segment of digital economies and are perceived as driving forces of electronic commerce in terms of global markets and digital business. Using WBSS, organizations have a new chance of their business evolving successfully as global marketers. This paper develops a unified model to assess the diffusion of WBSS. Factors that impact WBSS diffusion are identified and analyzed as the basis for empirical testing. A set of propositions is developed that allows operationalization of the model. The ultimate goal is to provide the new research insights for the academic circles and the practical guidelines for organizations wishing to undertake WBSS.

Key Words: Electronic Commerce, Web-Based Shopping Systems, Unified Model, ICT Diffusion

I. Introduction

Recently, information and communication technology (ICT), in particular the Internet and electronic commerce, has been increasingly recognized as a means of positive sustainability for driving global digital economy (OECD, 2000; Howcroft, 2001; Brynjolfsson and Kahin, 2002; Hudson, 2002). In this context, a growing body of literature has noted that the Internet technologies play a significant role in expanding its volume and scale of a global electronic commerce radically (Rayport and Bernard, 2001; Porter, 2001; Feeny, 2001; Looney et al., 2002; Chaudhury and Kuilboer, 2002). Among various types of e-businesses, the most well-known model is the so called dot-com (Porter, 2001), which utilizes several types of Web-based shopping systems (WBSS) applications.

Business on the back of Web-based shopping systems (WBSS) appears to be revolutionizing the way customers and organizations interact, independent of the time and place constraints associated with traditional forms of business. WBSS are network systems that connect customers, suppliers, collaborators and even competitors, enabling organizations to conduct new digital business not undertaken previously (Korper et al., 2000). WBSS are creating a new digital infrastructure that can integrate economic, social and community activities, commerce, entertainment and education (Korper et al., 2000; Arlitt et al., 2001). WBSS appear to offer new opportunities for firms, in the forms of increased market access and information, decreased operating and business costs, providing high-quality products, rapid service, and greater shopping convenience to customers. Well-known dot-coms such as Amazon.com, eBay.com and Tesco.com incorporate their WBSS applications with security systems, certificate systems, supply chain management systems, customer relation management systems and so on.

Web-based shopping businesses on WBSS are diffusing very rapidly across national boundaries, taking place between organizations and customers, and enterprises and the global market, across countries (Korper and Ellis, 2000; Looney and Chatterjee, 2002; Slyke et al., 2002). This global phenomenon of WBSS diffusion is of particular interest and can be considered utilizing the theory of innovation diffusion, because such research seeks to explore and explain why particular new technologies do diffuse quickly and widely, while others do not (Newell et al., 2000; p. 242). So far, the theory of diffusion has been frequently used to explain the complex nature of new ICT diffusion (e.g., Zmud, 1982; Liang, 1986; Brancheau and

Wetherbe, 1990; Krcmar and Lucas, 1991; Bouchard, 1993; Kettinger, 1997; Westland et al., 1998; Standing et al., 2000).

The goal of this paper is to present a unified model of WBSS diffusion, identifying fundamental factors related to WBSS diffusion specifically. We will address the research variables that may facilitate and can explain the phenomenon of WBSS diffusion. The model is used to develop a set of propositions that will drive the empirical work in assessing the diffusion of WBSS in contemporary electronic commerce circumstances.

II. Towards a Unified Model of WBSS Diffusion

2.1 Overview

Although the literature discussing electronic commerce is abundant and growing, few models of WBSS diffusion are offered. There is also little empirical research addressing the diffusion of WBSS. WBSS are different from traditional information systems. We can regard WBSS as a subset of Internet systems (Choi and Whinston, 2000; Kim & Galliers, 2003), because Internet systems include Web-based banking system, Web-based shopping system, Web-based advertising system, supply chain management system and authentication system (Choi and Whinston, 2000). Therefore, it is appropriate to apply the Internet systems diffusion model (Kim & Galliers, 2003), when developing the unified model of WBSS diffusion. Figure 1 provides an Internet systems diffusion model which is adopted for the purposes of this research.

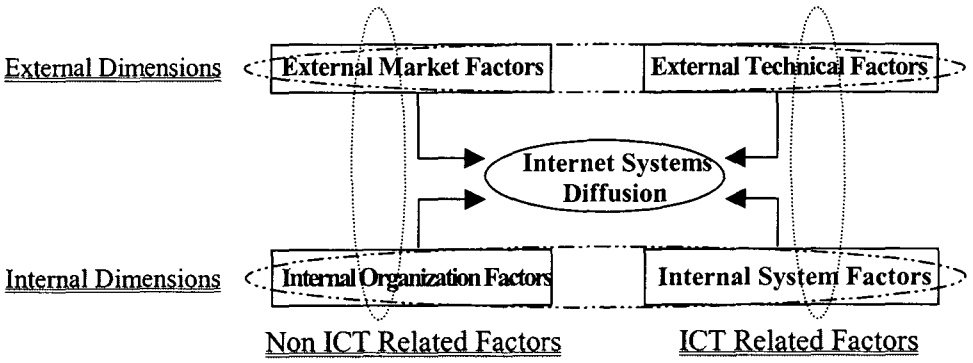

Figure 1. Diffusion Model of Internet Systems (Kim & Galliers, 2003)

As can be seen from Figure 1, the Internet systems diffusion model is arranged by the four categories of factors that appear to be closely relevant to Internet systems diffusion: "internal organization factors", "internal system factors", "external market factors", and "external technical factors". This offers a theoretical background for this research.

It can be seen that a wide range of factors appear to influence the diffusion of WBSS interacting in a global and dynamic fashion. Based on the Internet systems diffusion model (ref. Figure 1), we attempts to present a unified model of WBSS diffusion by tracing and selecting the fundamental variables that may facilitate and can explain the phenomenon of WBSS diffusion specifically. In building a unified model of WBSS diffusion, this research attempts to focus on certain points, i.e., a balanced view regarding both the internal and external factors as well as ICT-related and non-ICT related issues. As can be seen from the Internet systems diffusion model illustrated in Figure 1, there are five categories of variables: one category of dependent variables and four categories of independent variables. On the basis of this theoretical background, firstly dependent variables (that may measure the extent of WBSS diffusion), and then four categories of independent variables (that may facilitate WBSS diffusion), are identified. The diffusion model is used to develop a set of propositions that will drive the empirical work in assessing the diffusion of WBSS in electronic commerce circumstances.

2.2 Extent of WBSS Diffusion

2.2.1 Observation

WBSS link organizations with clients such as customers and businesses via the Internet (Arlitt et al., 2001). According to Korper and Ellis (2000),

WBSS are global-oriented network systems which consist of back-end systems, Web-servers and front-end clients, as illustrated in Figure 2.

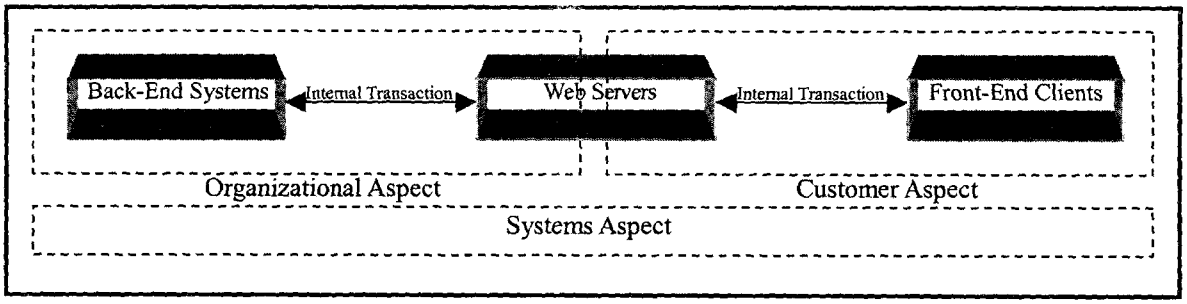

Figure 2. Extent of WBSS Diffusion

It appears that the extent of WBSS diffusion seems to depend on three major domains: organizations running the WBSS application, the clients such as customers and businesses accessing WBSS, and the WBSS itself carring out global Web-based shopping. On the basis of this observation, the extent of WBSS diffusion is thus measured from three perspectives: the organization, the customer and the systems.

2.2.2 Operationalization

In order to measure the extent of WBSS diffusion in terms of 1) the extent of WBSS access from the perspective of the customer, 2) the extent of internal usage on the WBSS within the organization, and 3) the extent of integration of the WBSS application in systems terms, these variables need to be operationalized, as can be seen from Table 6. In this section, the extent of WBSS diffusion is operationalized. On this basis, four categories of independent variables – external market, external technical, internal organizational, and internal system factors – are discussed below.

Table 1. Operationalization

Aspect	Description	References
•Customer	**Extent of WBSS Access by Customer:** • the extent of usage by customers • the extent of the growing number of business transactions • the extent of the services used by customers	Korper et al., 2000 Arlitt et al., 2001 Heikkila et al., 2001 Slyke et al., 2002 Looney et al., 2002
•Organization	**Extent of Internal Usage of WBSS:** • the degree of internal usage of WBSS for communication • the degree of information sharing on WBSS within the company •the degree of improvement in communications after using the WBSS	Koufaris et al., 1999 Salam et al., 1999 Korper et al., 2000 Tiwana et al., 2001
•Systems	**Extent of Integration of WBSS Application:** • the degree of integration with various other systems such as payment mechanisms, search engines, security systems, and Interanet systems • the extent of use of WBSS application as compared to competitors in the same industry • the degree of the integration with other system applications such as such as supply chain management systems or CRM systems	Choi et al., 1998 Jutla et al., 1999 Korper et al., 2000 Kampas, 2000 Fraternali et al., 2000 Papazoglou, 2001

2.3 External Market Factors

Whereas initially the Internet was perceived as a source of information for researchers, it has now become the fastest growing market place in global business (Riggins, 1999; Mahadevan, 2000; Watson et al., 2000; Porter, 2001). WBSS can enable organizations create a global market for selling and buying products, information and services. Therefore, external market factors are critical elements that could be expected to affect WBSS diffusion. We attempt to introduce new variables, because the external market factors are

one of the distinguishing elements in the WBSS diffusion model. The detailed reason for the chosen variables are based on the following.

2.3.1 Global Electronic Markets

Internet technologies are providing global electronic markets which act as an intermediary between seller and buyer, and merchant and customer (Schubert et al., 2000; Nour et al., 2000). These global electronic markets enable a wide range of seller and customer activities to converge into value-creating activities, including marketing, order processing, distribution, payments and production that involve several separate firms (Strader et al., 1997; Lindemann et al., 1999; Porter, 2001). A number of electronic markets are available to customers to buy products ranging from CDs to automobiles (Lindemann et al., 1999; Nour et al., 2000). WBSS enable firms to provide global electronic markets in diverse business ranges, such as auction houses, stock exchanges, retailers, digital products and so on. Thus, WBSS diffusion will be affected by the degree of expansion of global electronic markets in the industry. Based on this observation, the following proposition is proposed:

Proposition P1: The extent of the expansion of the global electronic markets within an industry is positively related to the extent of WBSS diffusion.

2.3.2 Digital Business

"The fact that images, sounds and words can be stored in bits and bytes makes it possible to transfer them in seconds, from one place to another, even if they are thousands of miles apart" (Van Hout et al., 2000; p. 200). Organizations can deliver digital business products such as news, literary works, images, music, information, books, magazines, movies, electronic games and software on WBSS anytime, and given the availability of the necessary technological infrastructure, anywhere in the world. It has been argued that digital business is turning the commercial world upside down (Tapscott, 1995; Hammond, 1996; Barua et al., 2000). Thus, digital business via WBSS is recognised by many companies as an enabler of new business opportunities. As such, the degree of digital business in an industry will positively influence the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P2: The extent of digital business within an industry is positively related to the extent of WBSS diffusion.

2.3.3 Market Dynamism

Market dynamism is "the rate of change in customers' preferences and competitors' actions" (Maltz and Kohli, 1996; p. 52). Companies acting in dynamic markets need to follow changes in their markets more frequently than firms in relatively stable markets (Fisher et al., 1997). Recently, Internet technologies have changed the means by which customers and organizations interact, such as setting new business processes, reducing transaction costs, improving customer relationships and providing new business opportunities (Gebauer et al., 2000; Rosen et al., 2000). In order to cope with today's real time Web-based shopping activities, organizations need to quickly identify and respond to customer needs and changing market conditions, according to Lindroos (1997), Iyer et al. (2000), and Elliot and Fowell (2000). As an enabler of new business, WBSS have distinguishing advantages in meeting various customer preferences, a global market and competitor information quickly. Thus, it can be argued that the extent of market dynamism in an industry will positively influence the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P3: The extent of the market dynamism within an industry is positively related to the extent of WBSS diffusion.

2.3.4 Customer Segmentation

"One of the key characteristics of the e-business world is that companies will inevitably move more and more into a customer-centric paradigm in order to increase competitiveness" (Papazoglou, 2001; p. 71). "Customer segmentation is of paramount importance to marketers because it helps better understand their shoppers and their needs" (Lee et al., 2000; p. 21). Customer segmentation includes knowing target customers, their characteristics, their Web-based shopping activities and their shopping expectations such as timeliness, customization and accuracy (Miller, 2000; p. 93). Therefore, it is important to know who the customers are, who are accessing or will access WBSS. For example, Fastparts.com's target customer is the electronic manufacturing industry, whilst Babyplanet.com is focusing sales on baby clothes. Thus, it can be argued that WBSS diffusion will be positively affected by a profound understanding of customer segmentation. Based on this observation, the following proposition is proposed:

Proposition P4: The extent of target customer segmentation within a global electronic market is positively related to the extent of WBSS diffusion.

2.4 External Technical Factors

ICT innovation diffusion is "a form of technological change that is shaped by the characteristics of information and information processing" (Monk, 1987). So, ICT innovation diffusion may produce "not only a dramatic shift in the technological base of modern societies but a dramatic social revolution as well" (Halal, 1993). Therefore, external technical factors are likely to have a significant influence on the conversion from organizational information systems to global WBSS. The detailed reasons for the chosen variables are based on the following.

2.4.1 Interactivity

Internet technologies are providing interactive applications that can be customized for multiple purposes and audiences (Laudon et al., 2000; Looney et al., 2002). Interactivity of Internet technology relates to its real-time and online nature, according to Dutta and Segev (2001; p. 7). The buyer and seller on WBSS could increase interactions through interactive Internet technologies such as Web sites, e-mail, Internet chat-rooms and Web conferencing (Hoffman and Novak, 1996; Laudon et al., 2000). This kind of global interactivity of Internet technologies is less prevalent with previous generations of ICT. Thus, the high interactivity of Internet technologies is positively to influence the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P5: The extent of perceived interactivity of Internet technologies is positively related to the extent of WBSS diffusion.

2.4.2 Connectivity

Connectivity is "the ability of computers and computer-based devices to communicate with one another and to share information in a meaningful way without human intervention" (Laudon et al., 2000; p. 276). The open nature of Internet technology is promoting connectivity that fosters the creation of a global market space (Dutta and Segev, 2001; p. 7). "The radical increase in connectivity enabled by the Internet technology is giving rise to new communication and co-ordination mechanisms both across organizations and customers, and also with groups of customers themselves" (Dutta and Segev, 1999). The Internet's global connectivity provides WBSS with links directly to customers, business partners or even competitors. Based on this observation, the following proposition is proposed:

Proposition P6: The extent of perceived connectivity of Internet technologies is positively related to the extent of WBSS diffusion.

2.4.3 Feasibility

"Internet technology provides better opportunities for companies to establish distinctive strategic positionings than did previous generations of information technology" (Porter, 2001; p. 64). Although Internet technologies have a potentially valuable capability, their feasibility is important and should be considered by organizations when adopting them (Perkowitz and Etzioni, 2000). Feasibility in this context has been defined as "the degree to which a proposed Internet technology can be implemented with the existing hardware, software, and technical resources" (Laudon et al., 2000; p. 348). Therefore, it is reasonable to expect that the extent of WBSS diffusion would be affected by the extent of feasibility of Internet technologies with existing IS/IT infrastructure. Based on this observation, the following proposition is proposed:

Proposition P7: The extent of perceived feasibility of Internet technologies is positively related to the extent of WBSS diffusion.

2.4.4 Trialability

Trialability is the degree to which a new technology may be experimented with on a trial basis (Rogers, 1995). Organizations evaluate Internet technology in terms of whether the investment is effective or beneficial before making a large scale investment (Karahanna et al., 1999). If Internet technology has high trialability due to the small capital investment and low technical expertise required, it may be expected to affect the extent of WBSS diffusion. Therefore, it can be argued that high trialability of Internet technologies will positively facilitate the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P8: The extent of perceived trialability of Internet technologies is positively related to the extent of WBSS diffusion.

2.5 Internal Organization Factors

Organizational factors are regarded as an important antecedent in the literature on information systems (Swanson, 1994; Tabor, 2000). For a long time, researchers have tried to explain what kinds of factors shape the organizational use of ICT (Zmud, 1982; Brancheau et al., 1990; Grover et al., 1993; Belassi et al., 1998; Cheung et al., 2000). In this

context, research on organizational factors considers the structure and processes of an organization that might facilitate the diffusion of ICT. Therefore, it will be valuable if our research attempted to explain WBSS diffusion according to factors more relevant to Web-based shopping business and electronic commerce. The detailed reasons for the chosen variables are based on the following.

2.5.1 E-business Planning

"E-business planning fills the gap between strategic planning and application and provides a common language that executives from marketing, information technology, and manufacturing can all understand" (Kalakota et al., 1999; p. 334). Therefore, as organizations initiate e-business, it is advisable for them to consider every aspect of it: e-business models, business processes, strategic planning, organizational culture, relationships with customers and suppliers, new kinds of system architecture, ICT adoption and so on (Bicknell, 1998; Kalakota et al., 1999; Laudon et al., 2000; Huang, 2001). Thus, we might expect that the extent of WBSS diffusion will be affected by the degree of e-business planning adopted by an organization. Based on this observation, the following proposition is proposed:

Proposition P9: The extent of e-business planning of an organization is positively related to the extent of WBSS diffusion.

2.5.2 Risk Management

WBSS are being established at a rapid rate across national boundaries. Along with the various potential benefits, there are several associated risks, such as penetration by hackers, fraudulent business transactions, electronic theft or payment fraud, false information, and Internet privacy (Cranor, 1998; Weinstein et al., 2000; Bhatnagar et al., 2000). According to Bhatnagar et al. (2000), there are two types of risk in the case of Web-based shopping activities. One is product category risk, which is associated with the product itself. "The risk is greatest when the product is technologically complex" (ibid; p. 99). The other is financial risk, which is associated with the Internet as a purchasing medium per se, rather than the consequences of purchasing particular goods. Therefore, it would appear that the stronger the action taken against risk related to Web-based shopping activities, the more customers' use of WBSS will increase, thus influencing the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P10: The extent of risk management related to Web-based shopping is positively related to the extent of WBSS diffusion.

2.5.3 Customer Service Quality

It has been argued that there is an essential need to provide qualitative customer service in Web-based shopping as a prerequisite for succeeding in e-commerce (Kare-Silver, 1998; Elliot et al., 2000; Liu et al., 2000). The major complaint of Web-based shoppers has been reported as being that shopping is troublesome due to lack of customer service (Elliot et al., 2000). According to recent research, Web-based shoppers were dissatisfied because of unfulfilled expectations, malfunctions in the Web site, unsatisfactory responses from site staff and the like (ibid; p. 329). Thus, it is argued that by providing a high quality service to their customers, WBSS loyalty will be cultivated among Web-based shoppers and will lead to competitive advantage through repeated purchases. Thus, we might expect that the degree of customer service quality will affect the diffusion of WBSS. Based on this observation, the following proposition is proposed:

Proposition P11: The extent of customer service quality is positively related to the extent of WBSS diffusion.

2.5.4 Knowledge Intensity

Knowledge is now recognized by many as the core productive and strategic asset of the organization for competive advantage (Eriksson et al., 2000). Furthermore, "the speed of new knowledge creation and knowledge transfer across markets and enterprises becomes a key determinant of enterprise success in an environment which is fast, discontinuous, and volatile" (El Sawy et al., 1999; p. 307). Thus, it is argued that the success of an organization depends on its ability to gather, produce, maintain, and disseminate knowledge (Eriksson et al., 2000; Laudon et al., 2000). Internet technology has emerged as a valuable tool which deals more easily and quickly with the creation, storage, process dissemination, and sharing of information and knowledge than previous ICT applications, according to Barua et al. (2000) and Holsapple et al. (2000). Thus, we can expect that the extent of WBSS diffusion will be affected by the degree of knowledge intensity in organizations adopting WBSS. Based on this observation, the following proposition is proposed:

Proposition P12: The extent of knowledge intensity in an organization is positively related to the extent of WBSS diffusion.

2.6 Internal System Factors

Internal system factors are related to the change management issues associated with a move from more traditional information systems to WBSS, and are relevant to the efficient management of new Internet technology adoption (Keen et al., 1999; Koper et al., 2000). WBSS are different from such previous information systems. Thus, it is not appropriate to apply the preceding variables to WBSS research. Therefore, we attempt to explore the validity of new variables that can explain and reflect the phenomenon of WBSS diffusion. The detailed chosen reason for each of the variables is based on the following observation.

2.6.1 Usability of WBSS

As more and more companies establish several kinds of Web-based shopping applications, the usability of system is one of the most important issues Web developers need to address (Iyer et al., 2000; p. 257). This is because one of the key success factors of WBSS can be judged as the usablity of WBSS access on the part of customers. The major elements of usability include good navigation, content quality, easy procedures, location transparency, positive customer experience and so on (Iyer et al., 2000; Elliot et al., 2000). Therefore, it can be argued that better usability of WBSS will provide significant benefits, such as increased customer access, which will in turn influence WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P 13: The extent of usability of WBSS is positively related to the extent of WBSS diffusion.

2.6.2 Security Management

According to Backhouse and Dhillon (1999; p. 2), "security management holds the key to success or failure of a company's well-being in light of the turbulent future and the existing competitive trends faced by the organizations." Security management is becoming one of the principal issues in Web-based shopping activities for both customers and sellers (Korper et al., 2000; Elliot et al., 2000; Joshi et al., 2001). For example, customers do not want to expose their information and transmit insecure payment for Web-based shopping transactions. Also, sellers should be protected against computer hackers, viruses or other forms of network intrusion which can have a detrimental effect and can shut down their system. Based on this observation, the following proposition is proposed:

Proposition P 14: The extent of security management of an organization is positively related to the extent of WBSS diffusion.

2.6.3 Network Infrastructure

A network infrastructure refers to the capabilities of communication networks that help in the sharing of ICT resources within and across the boundaries of organizations (Yates and Benjamin, 1991). Electronic commerce needs a network infrastructure to transport multiple types of information (Kalakota, 1996; p. 43). "There is a strong complementary relationship between the network infrastructure, Internet applications and e-commerce" (Barua et al., 2000; p. 102). Organizations based on a strong network infrastructure can more easily extend their business boundaries to the global marketplace (Laudon et al., 2000). Conversely, a poor network infrastructure will lead to barriers in adopting new Internet technologies or Internet systems. Thus, if organizations have a strong network infrastructure, it can be argued that they will be better able to carry out Web-based shopping transactions with customers in global electronic markets. Therefore, we can expect that the extent of WBSS diffusion will be affected by the degree of network infrastructure within an organization. Based on this observation, the following proposition is proposed:

Proposition P15: The extent of network infrastructure within an organization is positively related to the extent of WBSS diffusion.

2.6.4 Internet Technology Adaptability

E-business architecture of the future will need to enable rapid change in order to cope with dynamic business environments according to Evans (1999; p. 18). Hence, Internet technology adaptability is considered one of the key enablers in establishing Internet business architecture for gaining continuous competitive advantage (Lazzaro, 1994; Evans, 1999; Cline et al., 2000; Perkowitz et al., 2000). For example, successful dot-com companies such as eBay.com, Dell.com and Amazon.com are providing a new business model driven by the innovative application of Internet technologies, as a result of high Internet technology adaptability (Mahadevan, 2000; Barua et al., 2000). Therefore, we can assume that the degree of Internet technology adaptability of an organization will affect the extent of WBSS diffusion. Based on this observation, the following proposition is proposed:

Proposition P16: The extent of Internet technology adaptability of an organization is positively related to the extent of WBSS diffusion.

On the basis of the observations and propositions formed in relation to key impact factors and WBSS diffusion, the following section illustrates a unified model of WBSS diffusion that is derived. The model will provide a plat form for empirical research in Web-based shopping contexts specifically.

III. Conclusion and Discussion

As a result of the above observations and propositions concerning key impact factors and WBSS diffusion, a unified model of WBSS diffusion is developed and depicted in Figure 3.

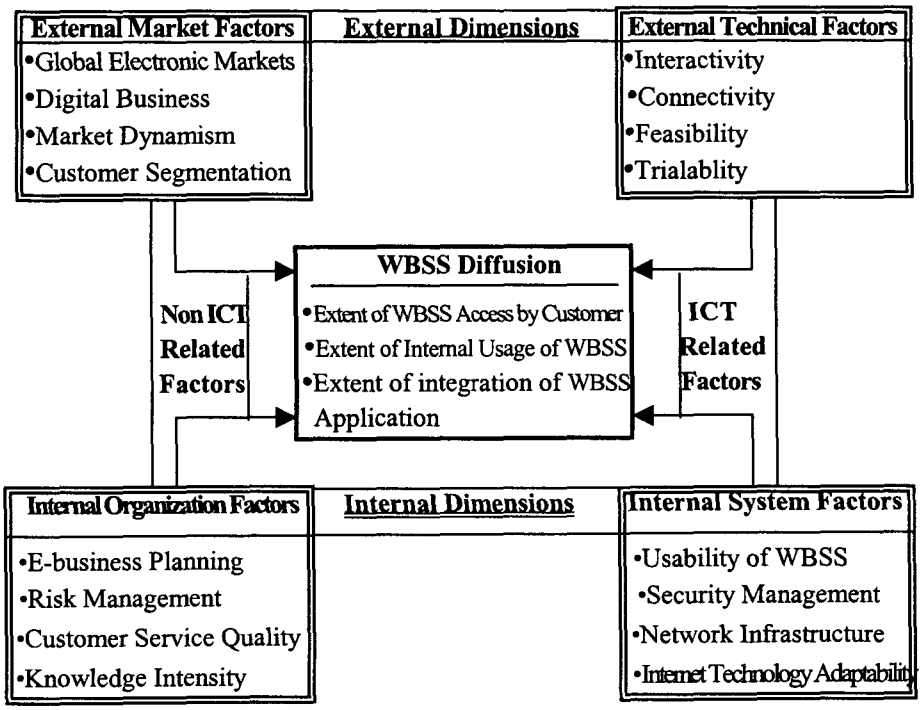

Figure 3. A Unified Model of WBSS Diffusion

We identified four groups of factors – external market, external technical, internal organization and internal system factors – that may affect the extent of WBSS diffusion. The expected relationships between the four group of factors and WBSS diffusion have already been discussed and proposed in the propositions. On this basis, this model consists of five primary dimensions: external market factors, external technical factors, internal organization factors, internal system factors and the extent of WBSS diffusion.

The major characteristics of a unified model on WBSS diffusion are as follows. First, extensive empirical research of WBSS diffusion has not yet been carried out. Research on Web-based shopping has commenced in many areas; however, much of this research has concentrated on exploratory studies rather than empirical research (e.g. Baty et al., 1995; Hoffman et al., 1996; Spiller et al., 1998; Nour et al., 2000; Arlitt et al., 2001). As a result, it can be claimed that this model is one of the first that will be used empirically to investigate the factors affecting the diffusion of WBSS.

Second, Table 2 provides a means of arranging all the factors identified thus far in relation to previous empirical research concerned with IS generally, IOS, EDI, EC, the Internet and WBSS. As can be seen in Table 2, only three variables, trialability, customer service quality, and usability have been empirically verified in previous IS research. All the other variables have not, as yet, been empirically tested. Thus, this study aims to verify their influence on the WBSS diffusion. In so doing, it is hoped that these newly identified variables will provide a useful insight and foundation for further WBSS and electronic commerce research.

Table 2. Reference Comparison of Key Impact Factors

Variables \ Research	WBSS	EC & Internet	IS, IOS, EDI	Reference
External Market Factors				
• Global Electronic Markets	X	X	X	Strader et al., 1997; Nour et al., 2000
• Digital Business	X	X	X	Tapscott, 1995; Hammond, 1996
• Market Dynamism	X	X	X	Maltz &Kohil, 1996; Fisher et al., 1997
• Customer Segmentation	X	X	X	Lee et al., 2000; Papazoglou, 2001
External Technical Factors				
• Interactivity	X	X	X	Dutta et al., 2001; Laudon et. al., 2000.
• Connectivity	X	X	X	Dutta et al., 2001; Laudon et. al., 2000
• Feasibility	X	X	X	Laudon et. al., 2000; Perkowitz et al., 2000
• Trialability	X	X	O	Rogers, 1995; Karahanna et al., 1999
Internal Organization Factors				
• E-business Planning	X	X	X	Kalakota et al., 1999; Korper et al., 2000
• Risk Management	X	X	X	Cranor, 1998; Bhatnagar et al., 2000
• Customer Service Quality	X	O	X	Elliot et al., 2000; Liu et al., 2000
• Knowledge Intensity	X	X	X	El Sawy et al., 1999; Eriksson et al., 2000
Internal System Factors				
• Usability	X	O	X	Liu et al., 2000; Lyer et al., 2000
• Security Management	X	X	X	Gupta et al., 1998; Korper et al., 2000
• Network Infrastructure	X	X	X	De et al., 1999; Laudon et al., 2000
• Internet Technology Adoptability	X	X	X	Cline et al., 2000; Perkowitz et al., 2000

O : Variables that have been empirically verified in IS research

X : Variables that have not been empirically verified in IS research

Additionally, we emphasize the significance of the balanced view considering both internal and external issues, as well as ICT and non-ICT oriented-factors in contemporary electronic commerce research settings. Each factor seems to have a significant impact on WBSS diffusion. Therefore, in order to highlight the significance of both aspects within the electronic commerce research agenda, we attempt to explore major characteristics of WBSS diffusion, concerning both internal and external factors, as well as ICT and non-ICT related issues.

Furthermore, this study has developed variables to assist in the measurement of the extent of WBSS diffusion. These measurement variables provide the theoretical background for further research on new ICT diffusion.

A further point to emphasis is that, as a result of the literature review, it became clear that most previous studies have not classified ICT related factors as a distinct subset in a research model, so previous ICT diffusion research merged ICT related factors into environmental, organizational, or ICT innovation factors. However, it would seem appropriate for ICT related factors to be distinguished from other factors, because they will be one of the critical components that organizations should take into account when establishing electronic commerce architecture, as argued by several researchers (e.g Kalakota et al., 1996; Laudon et al., 2000; Barua et al., 2000; Korper et al., 2000; Load, 2000; Arlitt et al., 2001; Porter, 2001; Looney et al., 2002). External technical factors and internal system factors are likely to facilitate the transition from more traditional information systems to the global WBSS. Therefore, this study suggests IT related factors – external technical factors and internal systems factors – as one of the critical sets of factors impacting WBSS diffusion.

Although the literature discussing electronic commerce is abundant and growing, few research models of WBSS diffusion are an offer. There is also little empirical research addressing the diffusion of WBSS. Based on various areas of study, the unified model developed here aims to identify and investigate factors that facilitate the diffusion of WBSS in electronic commerce circumstances. To this end, a set of propositions has been generated. These, however, need to be tested empirically. The propositions developed here allow the operationalization of the issues identified. We claim that the unified model of WBSS diffusion may be useful in gaining a

meaningful insight into further research related to WBSS diffusion and electronic commerce more generally. Since little comprehensive research has been undertaken, the diffusion model of WBSS presented in this paper may be a first step towards developing a growing body of research for the Web-based shopping and electronic commerce.

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