Marketing Modeling For Free Portal Web Sites

Portfolio Presented on December 20,2002 in Partial Fulfillment of the Requirements for the Degree

Doctor of Business Administration

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DOCTOR OF BUSINESS ADMINISTRATION
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D.B.A. RESEARCH PORTFOLIO SUBMISSION

RESEARCH PROJECT # 1: "MARKETING MODELING FOR FREE PORTAL WEB SITES

RESEARCH PROJECT #2: "INTERACTIVE SURFERS AS A FACTOR INFLUENCING FORUM TRAFFIC: AN EMPIRICAL STUDY OF THAI ONLINE FORUMS

RESEARCH PROJECT #3: FACTORS INFLUENCING ONLINE GAMER EXPERIENCE: AN EMPIRICAL STUDY USING EXPERIENCE SAMPLING METHOD

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Submitted on this 20th of December in the year 2002
For the partial requirements of the degree of
Doctor of Business Administration

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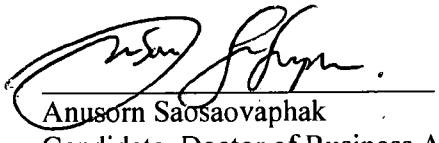

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OVERVIEW

The popularity of the Internet has induced thousands of firms to use it as a new channel for sales and marketing. It also creates a new market, which is distinguished from the physical marketplace and has information as a new locus in the value chain. In this market, information, as the key performance improvement that helps increase efficiency in the traditional market, has turned out to be a free-standing output or product in its own right and has become an autonomous source of competitive advantage. Various online services and marketing activities, such as electronic commerce and online advertising, have been introduced through web sites. A portal web site is one example. It provides a wide range of online resources and services such as a search engine, e-mail, games, message board, and news to surfers. Although there have been many studies about Internet marketing, the existing research does not discuss portal web site marketing as such. Therefore, the goal of these three papers is to fill in the knowledge gap in this area by proposing a portal web site marketing concept. It will focus on the free portal sites whose primary goal is to drive traffic through, offering a wide range of subjects their customers may be interested in. This type of web site, such as Yahoo!, Lycos, AOL, Hotmail and CNN, normally expects financial returns from other sources, such as advertisements, sales leads, or sponsorship fees. **Research Paper 1** will start with the market-space concept to illustrate the differences in the product and market from the traditional product and market. A five-stage model is proposed to describe activities that make portal sites successful. The five stages are traditional and online marketing activities, visiting, interaction, and revisiting. While traditional marketing activities stage refers to traditional marketing promotion activities, online marketing activities stage refers to programs implemented online such as web ads, link exchanges and search engine registration. The last three stages — visiting, interaction and revisiting — refer to the behaviour of visitors during visits to the site and the environment that encourages them to revisit. A model framework was constructed based on Flow theory (Csikszentmihalyi, 1997a, 1997b, 2000), telepresence (Steuer, 1992) and computer-mediated environment (Hoffman & Novak, 1996) concepts. It was used to explain how to make visitors feel interested in the web site, stay with it for a longer

period and want to revisit. Flow is the process of optimal experience (Csikszentmihalyi, 1977) "preceded by a set of antecedent conditions necessary for the experience to be achieved and followed by a set of consequences that occurs as a result of the process" (Hoffman & Novak 1996, p. 57). It leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel, Niekerk, Berthon, & Davies 1999, p. 111). For telepresence, it is described as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment. *Telepresence is defined as the experience of presence in an environment by means of a communication medium*" (Steuer 1992, p. 76).

Although there were studies about flow and computer mediated communication (Ghani & Deshpande 1994; Hoffman & Novak 1996; Nel *et al.,* 1999; Wieber & Kollmann, 1998), most of them discussed only flow at work. The model in this paper, however, will expand the flow concept to include flow in play and social flow. These three types of flow will help construct the portal site marketing model which will be able to explain surfers' behaviour when visiting the site, when they are, for example, searching for information, participating in a web board or chat room or playing an online game.

Research Paper 2 focuses on social flow, which happens when a person interacts with another person and his or her attention becomes structured by external demands (Csikszentmihalyi 1997b, p. 42). Interaction in this case is more than a basic conversation, it needs the person to pay attention, to know about and to share in the activities of the other person — it needs interest, requirements, attention and objective. A "successful interaction involves finding some compatibility between our goals and those of the other person or people, and becoming willing to invest attention in the other person's goals. When these conditions are met, it is possible to experience the flow that comes from optimal interaction" (Csikszentmihalyi, 1997a, p. 70).

An empirical study was conducted to find out the relationship between social interaction among surfers and traffic in Thai online forums. Normally, forums provide a service for groups of people to share ideas and discussion. Since the forum can attract surfers to a web site, many portal sites, which normally provide a wide range of online resources and services such as a search engine, e-mail, games, message-board and news to surfers, have included it as one of their services to surfers. In the study, 'copy point' methodology was used to code the data and a statistical relationship between the

variables was quantitatively tested. (See Appendix 1 in research paper 2 for an explanation of copy point methodology.)

Research Paper 3 is an empirical study to find out factors contributing to online gamer experience in real playing environments. A quantitative model using Structural Equation Modeling, which requires data to be collected from online game players while they are playing an online game in their normal environment, was used to test the fitness of model with collected data. A model framework was constructed and empirically tested to find out factors that made gamer feel they would like to interact with the game, spend a long time with it, and play it repeatedly. All these — high traffic, time spent at the site and return rate — are primary objectives for most portal web sites. This study used game arcades (Internet cafés) in Bangkok to collect data for the research.

The proposed model and empirical tests in these three papers are important to portal site marketing because there are implications for marketers concerning a new product in a new market. This study also expands the concept by adapting flow in different activities, namely flow at work, flow at play and social flow, into the model. As such, it should help contribute to theoretical knowledge in this area as well.

DBA Research Paper 1

Marketing modeling for free portal web sites

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Submitted on this 20th of December in the year 2002
For the partial requirement of the degree of
Doctor of Business Administration

"I hereby declare that this paper submitted in partial fulfillment of the DBA degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that it dose not constitute any previous work whether published of otherwise. In making this declaration, I understand and acknowledge any breaches of the declaration constitute academic misconduct which may result in my expulsion from the programme and/or exclusion from the award of the degree".

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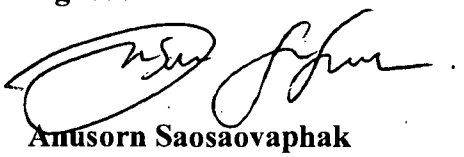

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Date: 20 December 2002

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Marketing modeling for free portal web sites

Abstract

This paper proposes a marketing model for free portal sites, ones that normally provide a wide range of online resources and services such as a search engine, e-mail, games, message-board and news to surfers. The model describes how to bring surfers into the site, keep their attention for longer periods and encourage them to revisit. A five-stage model describes activities to make the portal site successful: traditional and online marketing activities, visiting, interaction, and revisiting. The first two stages, traditional and online marketing activities, are the stages that attract surfers to the web site by traditional promotion and online activities, and the last three stages refer to the behavior of visitors during visits to the site and the environment that encourages them to revisit. These three stages use flow theory to explain consumers' behavior when surfing a web site and suggest why they want to interact with the site, what makes them stay longer, and why they want to come back.

Introduction

The popularity of the Internet has induced more and more firms to use it as a tool to manage their business (Doren, Fenchner & Green-Adlesderger 2000, p. 21; Kiani 1998, p. 185). Various online services and marketing activities, such as electronic commerce and online advertising, have been introduced through web sites (Kiani 1998, p. 185). A portal web site is one of them. It was defined as a web site that provides a wide range of online resources and services such as a search engine, e-mail, games, message board, and news to surfers (Auburn University 2001; Lynch 1998).

Although there have been many studies about Internet marketing, the existing research does not discuss portal web site marketing. The goal of this paper is to propose a portal web site marketing concept. It will focus on the free portal sites whose primary goal is to drive traffic through offering a wide range of subjects their customers would

be interested in. This type of web site, such as Yahoo!, Lycos, AOL, Hotmail and CNN, normally expects financial returns from other sources, such as advertisements, sales leads, or sponsorship fees. This paper will start with a section on marketspace model, how to measure Internet success, why repeat visitors are important and how to bring them back. The marketspace model will be used as an introduction part of how the new products and market are created. Flow theory (Csikszentmihalyi 1977, 1990, 1997a, 1997b, 2000), which asserts as the process of optimal experience (Csikszentmihalyi 1977; Csikszentmihalyi & LeFevre 1989, p. 816 quoted in Hoffman & Novak 1996b, p. 57) that leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel *et al.* 1999, p. 111), will be adapted to construct the portal site markting model. The flow concept has been applied in many computer human interaction studies (Ghani & Deshpande 1994; Hoffman & Novak 1996b; Nel, Niekerk, Berthon, & Davies 1999; Wieber & Kollmann 1998). This study will expand the concept by adapting flow in different activities, namely flow at work, flow at play and social flow (Csikszentmihalyi 1997a, 1997b, 2000), into the model.

An overview of the new market

The new market and products

The Internet has been widely used as a tool to manage business (Doren *et al.* 2000, p. 21; Kiani 1998, p. 185). Rayport and Sviokla (1994, p. 142) refer to this new emerging place as "marketspace". The market is distinguished from the physical marketplace and has information as a new locus in the value chain. It is "a virtual realm where products and services exist as digital information and can be delivered through information base channels" (Rayport & Sviokla 1995, p. 75). In this market, information, as the key performance improvement that helps increase efficiency in the traditional market, has turned out to be a free-standing output or product in its own right and has become an autonomous source of competitive advantage (Wieber & Kollmann 1998, pp. 603–604).

By observing how companies adopt value-adding information, Rayport and Sviokla (1995) divide the processes into three stages: visibility, mirroring capability, and value

matrix. The first, visibility, refers to the stage at which firms invest in technology to measure and control business processes. Information collected at this stage will help managers plan and manage their physical value chain more efficiently and effectively. The second, mirroring capability, is the stage where companies create virtual activities in the marketspace in parallel to a physical value chain in the marketplace. They assert that a value matrix where managers can deliver new value to customers in new ways by applying generic value-adding with the new virtual value chain will be the final stage. The "five value-adding steps" (consisting of gather, organize, select, synthesize and distribute) of information are the processes, in conjunction with the virtual value chain, that will allow companies to understand and respond better to their customers. According to Wieber and Kollmann (1998), in this new place, information is turned into a free-standing output or product by itself. It can also increase value and utility on top of the physical offers in the marketplace through the utilization of the two markets. Collection, systemization, selection, combination and distribution of information will become primary activities, linked back to the virtual-actual and physical value chain in which supporting activities reside. The portal site is one of the new products created from this new marketspace. It has never existed in the traditional marketplace before. As such, the marketing concerned with examining portal site may be different from the perspective of classical marketing problems as it has unique characteristics in important ways. For example, communication between seller and buyer has significantly changed. The rich information presented to users in one-way, traditional communication channels such as radio, newspaper or TV is still important but may not be enough anymore. New characteristics, such as interactivity and response speed, have to be seriously considered as well. Figure 1, adapted from Porter (1985, p. 37), Rayport and Sviokla (1995) and Wieber and Kollmann (1998), illustrates the marketspace model.

A model to approach

The following section will discuss the set-up objective of the portal site and how to measure its success. The number of visitors to the site, or traffic, time spent in it and the return rate will be regarded as successful indicators. Based on these indicators,

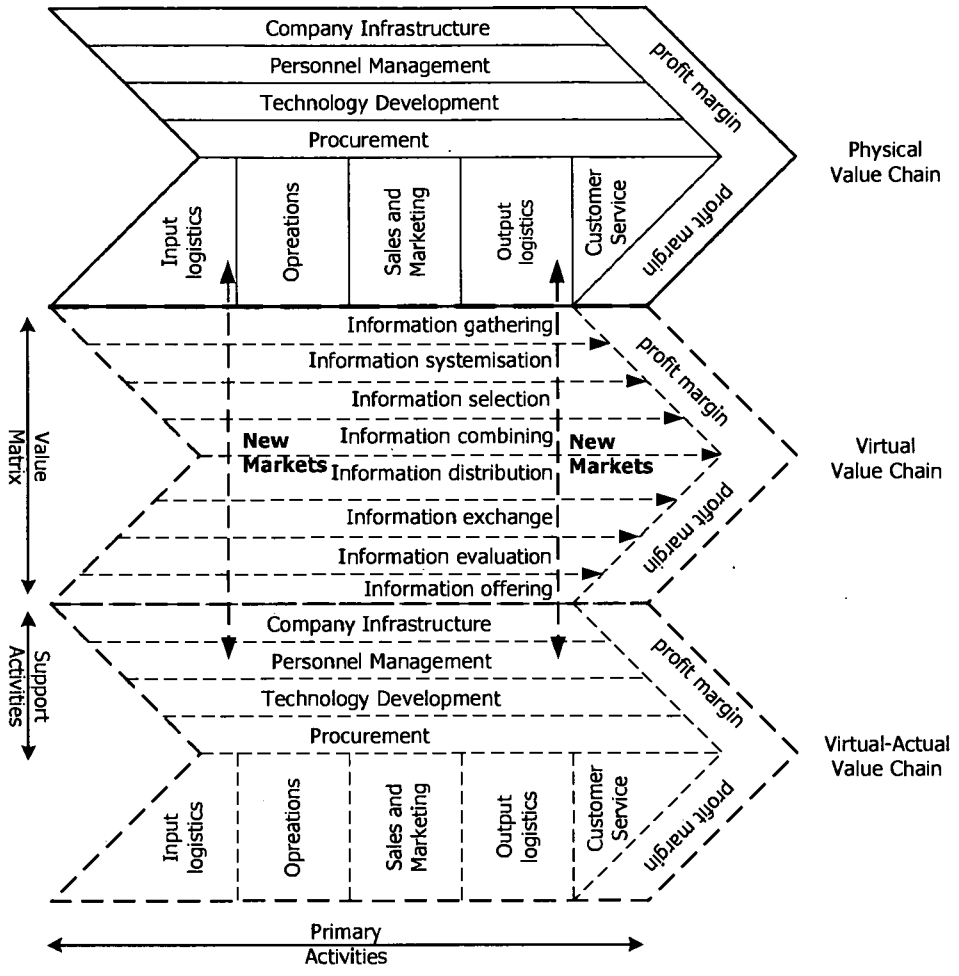

Figure 1. Marketspace Model

five stages — traditional and online marketing activities, visiting, interact, and revisiting — the marketing objective adapted from Kiani (1998) will be proposed as the activities for portal site marketing. The first two stages, traditional and online marketing activities, will suggest how to drive traffic to the site by using traditional and online promotion. The latter three will be explained by using flow (Csikszentmihalyi 1997a, 1997b, 2000), telepresence (Steuer 1992) and computer-mediated environment (Ghani & Deshpande 1994; Hoffman & Novak 1996b; Nel *et al.* 1999; Wieber & Kollmann 1998) concepts to explain how to sustain surfers' attention for longer periods and make them visit repeatedly. In the last part, consequences of experiencing flow shall be discussed as well. Figure 2 illustrates the model. Explanation about it will be in the following sections.

Set-up objective and how to measure the portal sites' success

Although there are many assertions about a successful indicator of web sites (Dholakia & Rego 1998; Doren *et al.* 2000; Kiani 1998; Malik 2000; Nel *et al.* 1999; O'Keefe, O'Connor & Kung 1998), most of them relate it to the set-up objective. A web site that aims to sell products or services online would consider revenues or profits generated from the site as its successful indicator. One that aims to provide company information would look at number of visitors, page views, or business transactions generated from the web site. Similarly, a portal site such as Time or Newsweek might aim for sales leads from their sites and others aim for advertising revenues. In any case, traffic will be the first thing that most portal sites would expect. The higher the traffic, the higher the opportunities to present content and services to visitors. In addition to the traffic, the time that visitors spend at the site, depth of search and navigation patterns through the site, and the return rate are also important measures for evaluating web-site effectiveness. (Hoffman & Novak 1996b, p. 58) Therefore, the model to be proposed will address all these issues: how to attract surfers to the site, encourage them to stay longer on the site and make them wanted to come back. It will use traffic as the goal to achieve the set-up objective in general, as opposed to the set-up objective in a specific portal site. Thus, the goal that may lead to the set-up objective is also not specific, as in, for example, enticing surfers to

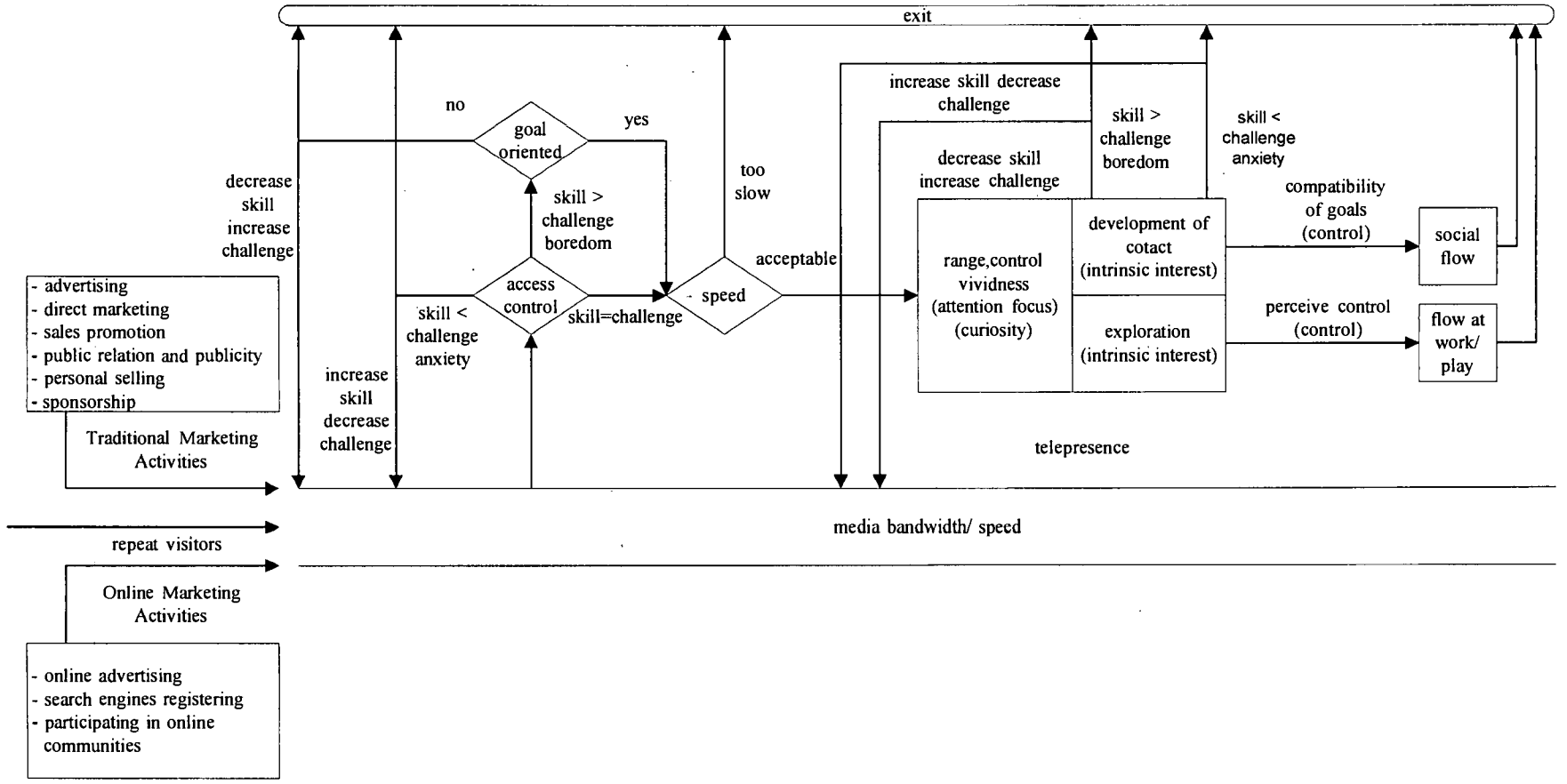

Figure 2: Five stage portal site marketing

purchase goods online, but rather relates more generally to the process of accessing and interacting with the web site.

Marketing on the free portal sites

Traditional marketing activities

Traditional marketing activities stage is referred to as promotion mix activities in the traditional media, such as newspapers, billboards, television and radio. The main objective is to communicate promotional messages about the web site to audiences. It "will involve an appropriate selection from the range of tools that are available for use as part of the promotional mix" (Rowley 1998, p. 384). The tools include advertising, direct marketing, sales promotion, public relations and publicity, personal selling and sponsorship. The media for communicating to customers will be newspapers, magazines, TV, letterheads, business cards, brochures, packages and so on (Doren *et al.* 2000, p. 29, Kiani 1998, p. 193; Peattie & Peters 1997). According to Rowley (1998, p. 385), there are three stages in the communication process. The first, the cognitive stage, makes customers aware of products. The second, the affective stage, is when opinions and attitudes about the products develop. The third, the behavior stage, is when customers take action. In the same manner, the advertising communication process for a web site aims to make customers aware of the site, develop their opinions and attitudes about it and encourage them to visit the site.

Online marketing activities

Marketing in the online environment is another source that draws visitors to web sites. Marketing activities in this stage include placing advertisements online, registering the web site with search engines, and participating in online communities such as forums, mailing list and newsgroups (Kiani 1998, p. 191).

Advertising in the Internet is now widely used as a marketing tool (Doren *et al.* 2000). In this new media, the communication between seller and buyer has changed significantly. The information presented to users in one-way, traditional communication channels, such as radio, newspaper or TV, has become two-way interactive (Doren *et al.* 2000, p. 22; Hoffman & Novak 1996b). While communication in the traditional media is highly unfocused, two-way interactive

media allows a one-to-one communication between marketers and individual consumers (Kiani 1998). Due to changes in the communication environment, it becomes crucial to understand the factors that influence customer visits. Yuan, Caulkins and Roehring (1998) assert that there are three broad areas of Internet advertising strategies that marketers need to consider. The first is how to deliver a message to customers. Marketers may try to deliver the message directly to customers' attentions by placing ads at a well-known site or indirectly by setting up a web site that allows customers access at will. The second area is how advertisements are placed, for instance, as stand-alone or as a bundle with non-advertising content. While a direct email advertisement is normally stand-alone, banner advertisements placed online are bundled with content on that site. The third area to consider is if rewards are to be given to customers for viewing advertisements. Marketers might provide special offers if a customer clicks the advertising banner, or use other methods, such as attractive designs, to induce visitors. Advertising value, content, and effectiveness are important issues to be considered by marketers too (*see* Doren *et al.* 2000; Ducoffe 1996; Hofacker & Murphy 1998; Raman & Leckenby 1998 for more details).

Registering the web site on search engines will induce more traffic (Doren *et al.* 2000, p. 29; Kiani 1998, p. 191; Thelwall 2000, p. 150). Search engines and similar services such as online Yellow Pages and web directories are the places that provide indexed information about web sites for surfers to search for specific topics. Most surfers use search engines as one of their strategies to find new web sites (CyberAtlast quoted in Thelwall 2000, p.150). Webmasters who want to attract new users should register their web site on the search engines (Thelwall 2000, p. 150). Search engines normally use two methods to index web pages: following links from previously registered sites; and allowing new web sites to register with them (Thelwall 2000). The number of links from previous registered sites is also used for ranking the popularity of web sites. The technique used to rank web sites on the Google search engine is to judge them by the number of links from other sites that point to them (Malik 2000). This presumes that nobody wants to link to a bad site. The more popular sites will have a better rank and the opportunity to be seen first by searchers.

There are two ways to increase link popularity. The first is when a web page becomes popular, then more sites will likely link to it (Malik 2000). The second is to

exchange links with other sites so that the number of links to it will automatically increase. While search engines accept this method, those who make artificial links from dummy sites will be discarded from the database if they are detected (Kirsch; Laursen; Marchiori; Tunender and Ervin cited in Thelwall 2000).

Lastly, companies, in order to increase their visibility and creditability, may participate in online activities that are not organized primarily for commercial purposes (Doren *et al.* 2000, p. 29; Kiani 1998, p. 191; Kotler 1997). There are three broad groups of activities with high visibility (Kotler 1997): online forums created mainly for groups of people to share ideas and discussion; newsgroups, similar to forums but limited to users posting and reading message on a particular topic; and bulletin board systems (BBS), online services created for a specific topic or group.

Visit, interact, and revisit

When surfers arrive at a web site, it is important that they are encouraged to interact further with it, to feel impressed, and to want to come back. Hoffman and Novak (1996b) and Nel *et al.* (1999) propose a "flow" concept to explain users' behaviors while accessing web sites. Hoffman and Novak (1996b) define flow in a mediated environment as "the state occurring during network navigation which is: 1) characterized by a seamless sequence of responses facilitated by machine interactivity, 2) intrinsically enjoyable, 3) accompanied by a loss of self-consciousness, and 4) self-reinforcing". To experience flow while engaged in an activity, consumers must perceive a balance, which has to be above a critical threshold, between their skills and the challenges of the activity (Hoffman & Novak 1996b). Consequently, it will lead to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel *et al.* 1999, p. 111). An empirical study conducted by Nel *et al.* 1999 reveals that surfers tend to revisit web sites at which they experience higher states of flow.

Based on the previous studies (Hoffman & Novak 1996b; Nel *et al.* 1999), which use Csikszentmihalyi's flow concept (1977, 1990), this paper will further adapt flow at work, flow at play and social flow concepts (Csikszentmihalyi 1997a, 1997b, 2000) that describe how flow occurs in different activities to construct the model.

Flow concept

Flow tends to occur when an individual faces a clear set of goals that require appropriate responses (Csikszentmihalyi 1997b, p.29). It "happens when a person's skills are fully involved in overcoming a challenge that is just about manageable, so it acts as a magnet for learning new skills and increasing challenges. If challenges are too low, one gets back to flow by increasing them. If challenges are too great, one can return to the flow state by learning new skills" (Csikszentmihalyi 1997a, p. 47). The author explains that flow can be created from almost any activity provided the relevant factors are present. Implicit from the earlier flow concept (Whalen 1999), Csikszentmihalyi (1997a) categorizes and describes activities in three broad areas: flow at work, flow at play and social flow.

Flow at work happens at any time while an individual is working on a job. The Experience Sampling Method (ESM) (*see* Kubey, Larson & Csikszentmihalyi 1996 for more details) studies suggests that flow on the job happens more often than in free time, mainly because a person at work normally has certain goals and rules to evaluate performance. There is feedback from a supervisor if the job is well done or if it has finished as expected. Its difficulties tend to match the worker's skills (Csikszentmihalyi 1997a, p. 47).

Flow at play can happen more easily than other types of flow as it has a clear set of rules and regulations (Csikszentmihalyi 1997a). Leisure time, such as playing sport or games, watching TV, hobbies, and going to restaurants and movies, can be categorized as activities which include media consumption, conversation and active leisure (Csikszentmihalyi 1997a, p. 48). Each requires an initial investment to overcome obstructions such as understanding the rules of a game, knowing how to control equipment, or going to a place to play sport. Evidence shows that people spend longer time watching TV than on hobbies or sports, despite having less flow, since TV is more accessible than the others, and therefore, "If a person is too tired, anxious, or lacks discipline to overcome the initial obstacle, he or she will have to settle for something that, although less enjoyable, is more accessible" (Csikszentmihalyi 1997a, p. 48).

Social flow happens when a person interacts with another person and his or her attention becomes structured by external demands (Csikszentmihalyi 1997b, p. 42). "The level of both challenges and skills can grow every high. Thus, interactions have

many of the characteristics of flow activities, and they certainly require the orderly investment of mental energy" (Csikszentmihalyi 1997a, p. 70). Flow can happen in everyday life when one socializes, such as talking or joking with others in a less structured environment (Csikszentmihalyi 2000). The author named the flow in this case as a microflow and says that it "may be as intrinsically rewarding as deep-flow activities, depending on a person's life situation" (Csikszentmihalyi 2000, p. 141). However, interaction in this case is more than a basic conversation, it needs one to pay attention, to know and to share the activities of the other person – such as interest, requirements, attention and objective. A "successful interaction involves finding some compatibility between our goals and those of the other person or persons, and becoming willing to invest attention in the other person's goals. When these conditions are met, it is possible to experience the flow that comes from optimal interaction" (Csikszentmihalyi 1997a, p. 70).

Flow and the mediated environment

In the computer-mediated environment, there are two stages involved in the development of flow. First, a surfer needs to undertake the necessary procedures required to enter the web site. Flow cannot take for granted, and effort or accessibility is the important factor that one has to invest (Whalen 1999). One of the important questions is, "What makes a person able to overcome entropy?" (Whalen 1999) A portal site survey shows that users prefer simple and easy-to-use search technology for finding information on the Internet (Anon, 2000). A web site that requires users to key in a long address or to enter a password before accessing it would require more effort to go to than the one with a shorter address and no password. Secondly, through the use of Internet technology, users are transported across time and space to another location in the cyberspace. They feel a sense of being present in a virtual environment and can interact with it as if they were in the real world (Shih 1998, p. 658). There are four dimensions that facilitate flow (Nel *et al.* 1999; Trevino & Webster 1992). Firstly, control, which refers to the individual's perceived sense of control over the activity being performed. Secondly, attention focus, that occurs when an individual's focus of attention is narrowed toward the interaction or stimulus field, which is a computer screen, while other thoughts are filtered out. Thirdly, curiosity happens when an individual's sense of curiosity is aroused during interaction with web pages.

Lastly, there is the intrinsic interest or enjoyment that the individual feels from interacting with the medium and the content.

An example of how flow at play occurs is when a user wants to play an online game. Firstly, he or she has to make efforts to enter the web site and start up the game. After this, the flow at play is likely to occur if the user feels a sense of control over the game, concentrates on the screen, and is curious about and enjoys the game. Another example is that of users who participate in a message board. The first thing they have to do is go to it and pay attention to find out about and share activities with other people by reading and answering messages. By doing that, users feel as if they were communicating with someone. A sense of immediate feedback from interacting with messages, which is required to experience flow (Csikszentmihalyi 1997b, p. 30), will be developed (Steuer 1992, pp. 78–79). If the user can find compatible goals with the other they are communicating with, it will facilitate control and intrinsic interest (Trevino & Webster 1992), and if his or her attention is focused on the web board and a sense of curiosity is aroused, then the social flow will likely occur.

As implied by these two examples, marketers should make the web easily accessible and facilitate the processes needed to produce flow. For instance, a message board should be categorized by topic so that it is easier for users to find a matching group of interest. For the game site, it should be categorized by degree of difficulty so that users can choose an appropriate level to play that matches their skills.

Flow and telepresence

In cyberspace, flow needs a proper mediated environment to facilitate it. An online game with better images and response time would make a surfer feel better than one that has less to offer. Steuer (1992) uses a telepresence concept to explain the mediated environment. Telepresence is described as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment. *Telepresence is defined as the experience of presence in an environment by means of a communication medium*" (Steuer 1992, p. 76). Mediated communication in telepresence is different from the traditional concept, in which media are viewed as conduits to send information back and forth between sender and

receiver. Instead, it focuses more on mediated environments with which communicators interact and experience (Steuer 1992, p. 78). The author states that telepresence can happen in many situations, such as using an electronic bulletin-board system, or driving an animated car in a video game. Each arouses a feeling of telepresence, and the "similar sense can be experienced via virtually any technology used in mediated communication" (Steuer 1992, p. 79). On the Internet, telepresence make users feel present in another location and the degree to which one feels telepresence is subject to the technology that allows users to interact with the environment (Shih 1998, p. 658). Two dimensions affect the degree of telepresence: vividness of sensory information and interactivity of the communication medium (Hoffman & Novak 1996b; Shih 1998; Steuer 1992).

Vividness

Vividness is referred to as "the representational richness of a mediated environment as defined by its formal features; that is, the way in which an environment presents information to the senses" (Steuer 1992, p. 81). Vividness has two important variables contribute to it: breadth and depth (Steuer 1992). Breadth refers to the sensory information and depth refers to the quality and amount of the information (Hoffman & Novak 1996b, p.61; Shih 1998, p. 656; Steuer 1992, pp. 81–84). It is important as it affects people's perceptions, such as smell, touch and vision in the physical environment. For example, the breadth of the print or radio technologies can capture only the visual or aural sense and is lower than the Internet technologies that can capture both, and the depth of a grayscale photograph is lower than that of a color one (Shih 1998, Steuer 1992).

Apart from breadth and depth, characteristics of information are proposed by many theories and viewpoints (Maule 1998). The terms information and content have also been used interchangeably (Hoffman & Thomas 1996a, p. 1). Many studies define the web page as a place that provides information and content (Dholakia & Rego 1998, p. 726; Hoffman & Thomas 1996b, p. 57; Maule 1998, pp. 57–58; O'Keefe, O'Connor & Kung 1998, p. 632; Lu & Yeung 1998). Abels, White, and Hahn (1999, p. 38) make a distinction by referring to information content as 'content' and web page content as 'appearance'. Other studies, including those by Dholakia and Rego (1998) and

O'Keefe, O'Connor and Kung (1998), determine the quality of information content by using the frequency of categorized items on web pages.

In short, information is referred to as the communication of knowledge, intelligence, fact or data. Its breadth and depth are the characteristics that affect people's perceptions. The quality of it depends on whether or not it meets visitors' objectives, expectations and interpretation. And content is referred to as 'the information features, or services that are offered in the web-site design and the way it is made available for web visitors' (Huizingh 2000).

Interactivity

Steuer (1992, p. 81) refers to interactivity as "the extent to which users can participate in modifying the form and content of a mediated environment in real time". It is determined by the technological structure of the medium.

In the communication research field, interactivity has been defined as a process-related construct about communication. "It is the extent to which message in a sequence relate to each other, and especially the extent to which later messages recount the relatedness of earlier messages" (Rafaeli & Sudweeks 1997). The applications or media themselves are not interactive since they neither understand nor respond to the sequence of the messages. However, they can mediate and facilitate, or impede interactive communication (Rafaeli & Sudweeks 1997; Schultz 1999). According to Jones (1997), interactivity communication can be seen as having three levels: two-way non-interactive, reactive, and fully interactive. The author asserts that two-way exchange happens when messages flow bilaterally. Reactive (or quasi) communication is when, in addition to the two-way exchange, later messages refer to the previous ones, and fully interactive communication occurs when "later messages in any sequence take into account not just messages that preceded them, but also the manner in which previous messages were reactive". According to Newhagen and Rafaeli (1996), all communication is naturally synchronous and temporally sensitive, but the "Net can stretch the edges of the synchronicity continuum" so that, while it can travel through the Net at unprecedented speed, it can be consumed by unprecedented delay.

In telepresence, three factors contribute to interactivity (Steuer 1992). The first, speed, refers to the rate at which information can pass through the medium. The rate

will directly affect the speed of interaction or response time. Secondly, there is range, the number of possible actions at any given time. Thirdly, mapping refers to how naturally human actions can match changes in the mediated environment. However, Shih (1998) asserts that interactivity can be determined by speed, the reaction time from the media, and control, the degree to which users can modify or control flow of information. Following Card, Robertson, and Mackinlay (1991) and Miller (1968), Neilsen (1997) asserts three important limits on the speed of interaction or response time:

- 0.1 second, is about the limit for the user to feel that the system is reacting instantaneously
- 1.0 seconds is about the limit for the user's flow of thought to stay uninterrupted, even though the user will notice the delay
- 10 seconds is about the limit for keeping the user's attention focused on the dialogue.

In short, flow will occur more easily if the user feels transported from their immediate physical environment into the mediated environment. The sense of being present in the computer-mediated environment is called telepresence.

The consequences of experiencing flow

Surfers who experience flow in the computer-mediated environment will achieve a sense of exhilaration and of enjoyment (Nel *at al.* 1999). The best moments usually occur "when a person's entire being is stretched in the full function of body and mind, whatever one does becomes worth doing for its own sake" (Csikszentmihalyi 1997b, p. 32). The flow experience is a desirable goal and encourages repetition (Ghani & Deshpande 1994). It will increase learning, perceived behavioral control, increase exploratory and participatory behavior and positive subjective experience (Hoffman & Novak, 1996b).

Research Issues

Social flow measurement

Flow in the human-computer interaction has been empirically tested in many studies (e.g. Ghani & Deshpande 1994; Nel *et at.* 1999; Trevino & Webster 1992). However,

none have been conducted for the sense of social flow. Internet portal sites are facing increasing competitive pressure to continually enrich their sites with new and compelling applications, to attract both new and regular visitors. One service that portal sites can use to attract visitors is the message board, in which surfers get together to develop and share their experiences. An empirical study should be conducted to find out if social flow occurs in a message board, increases surfers' visiting time and encourages repeat visiting. One of the methodologies to measure flow is a Likert-type scale questionnaire. A self-report scale with items measuring how users feel can measure the four dimensions of flow: control, attention focus, curiosity, and intrinsic interest (Trevino & Webster 1992; Ghani & Deshpande 1994; Nel *et al.* 1999).

Flow at play measurement

"Internet game sites are among the big portals' most popular and 'stickiest' draws" and it becomes standard offers on big web portals such as Yahoo! and America Online (Crockett 2001). About 40 million people, or 26% of US web surfers, spend time at game sites such as <PlanetFortress.com>, and <Myst.com> and customers return and spend an average of nearly three hours a month (PC Data and Jupiter Media Matrix quoted in Crockett 2001). As such, an empirical test to find out factors that contribute to flow at play and its consequences will contribute to the knowledge in this area.

Factors contributing to web boards' popularity

With respect to the conceptual framework, one of the possible research questions is to find out the extent to which social flow and telepresence environments are positively related to the popularity of web boards in free portal sites. Vividness of content and interactivity, which boost flow (Hoffman & Novak 1996b), can be quantified and used as independent variables by analyzing and coding the frequency of the targeted items. For instance, vividness can be coded by the availability of information regarding graphics, sound, and color. Interactivity is based on the number of internal hyperlinks and the speed for downloading each page. On the social flow, the number of messages in each topic in the web board shall determine the degree of development in, and matching of, communication. For the dependent variable, the total number of topics posted on to a web board for a certain period of time shall determine its popularity.

This methodology is adapted from earlier Internet studies (Dholakia & Rego 1998; O'Keefe et al 1998). It is also widely used in advertising research and is named 'copy-point' (e.g. Resnik & Stern 1977; Pollay 1985; Fay & Currier 1994).

Conclusion

A portal site is a new product and service created in the Internet world which has become popular. The marketing concerned with examining portal site was found to be different from the perspective of classical marketing problems as it has unique characteristics in important ways. In order to achieve important marketing objectives such as how to sustain surfers' attention for longer periods and make them visit repeatedly, this paper has proposed a conceptual foundation that uses the five stages — traditional and online marketing activities, visiting, interaction, and revisiting — approach to construct a portal site marketing model. While the first two stages, traditional and online marketing activities, are the stages that attract surfers to the web site by way of traditional promotion and online activities, the last three stages refer to their behavior during visits to the site and the environment that encourages revisiting. These three stages are addressed by using flow at work, flow at play and social flow concepts to construct a model to suggest why surfers want to interact with the web site, what make them stay on the site, and why they want to return. Implications for marketers were also suggested with respect to the positioning of their web site within its classification.

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DBA Research Paper 2

Interactive surfers as a factor influencing forum traffic: An empirical study of Thai online forums

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Submitted on this 20th of December in the year 2002
For the partial requirement of the degree of
Doctor of Business Administration

"I hereby declare that this paper submitted in partial fulfillment of the DBA degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that it dose not constitute any previous work whether published of otherwise. In making this declaration, I understand and acknowledge any breaches of the declaration constitute academic misconduct which may result in my expulsion from the programme and/or exclusion from the award of the degree".

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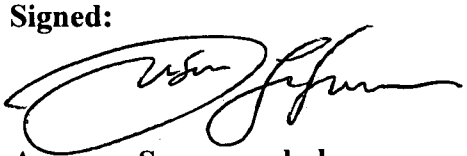

Anusorn Saosaovaphak
Date: 20 December 2002

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Interactive surfers as a factor influencing forum traffic: An empirical study of Thai online forums

Abstract

The purpose of this study was to conduct an empirical study to find out the relationship between social interaction among surfers and traffic in Thai online forums. Normally, forums provide a service for groups of people to share ideas and discussion. Since the forum can attract surfers to a web site, many portal sites, which normally provide a wide range of online resources and services such as a search engine, e-mail, games, message-board and news to surfers, have now included it as one of their services. A model was constructed and used as a framework for this study, based on a five-stage model which describes the major activities necessary to make the portal site successful: traditional and online marketing activities, visiting, interaction and revisiting. The first two stages, traditional and online marketing activities, are stages that attract surfers to the web site by traditional promotion and online activities, and the last three refer to the behaviour of visitors when visiting a forum and the factors that encourage them to visit repeatedly. These three stages are described by using social flow theory to explain why visitors want to interact with the site, what makes them stay for a long while, and why they want to come back. An empirical test of these last three steps was conducted by using online forums in Thailand as the subjects. The test was important to Internet marketers because it had implications for online forum strategies. In addition, it helped expand theoretical knowledge of social flow in a computer-mediated environment.

Introduction

The aim of this paper was to conduct an empirical test to find out the extent to which social interactions among surfers contribute to online forum traffic. In particular, the relationship between interactive surfers and traffic was tested

statistically using Thai online forums. An online forum is an Internet activity with high visibility created mainly for groups of people to share ideas and discussion (Kotler, 1997). It has become one of the services that many web sites provide to surfers. Although they are created with different objectives, a high traffic or a high number of messages posted in the board would be preferred by most webmasters. Since an online forum can attract visitors, many free portal sites are using it to drive traffic to their sites. A portal site normally provides a wide range of online resources and services such as a search engine, e-mail, games, message boards, and news to surfers (Auburn University, 2001; Lynch, 1998). Free portal sites, in particular, such as Yahoo!, Lycos, AOL, Hotmail and CNN, normally expect financial returns from other sources, such as advertisements, sales leads, or sponsorship fees. Although there have been many studies about Internet marketing, the existing research does not discuss online forum marketing. Therefore, the results of this study would contribute to the knowledge in this area.

Adapted from Kiani (1998), the following section will propose a five-stage model — traditional and online marketing activities, visiting, interact, and revisiting — as the major activities for online forum marketing. The first two stages: traditional and online marketing activities, will suggest how to drive traffic to the site using traditional and online promotion. The latter three will use flow theory (Csikszentmihalyi, 1977, 1990, 1997a, 1997b, 2000), telepresence (Steuer, 1992) and computer-mediated environment (Ghani & Deshpande, 1994; Hoffman & Novak, 1996b; Nel, Niekerk, Berthon, & Davies, 1999; Wieber & Kollmann, 1998) concepts to explain how to sustain surfers' attention for longer periods and make them revisit repeatedly. Flow is the process of optimal experience (Csikszentmihalyi, 1977; Csikszentmihalyi & LeFevre, 1989, p. 816 quoted in Hoffman & Novak 1996b, p. 57) "preceded by a set of antecedent conditions necessary for the experience to be achieved and followed by a set of consequences that occurs as a result of the process" (Hoffman & Novak, 1996b, p. 57). It leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel *et al.*, 1999, p. 111). The flow concept has been applied in many computer human interaction studies (Ghani &

Deshpande, 1994; Hoffman & Novak, 1996b; Nel *et al.*, 1999; Wieber & Kollmann, 1998) but not in the area of social flow which happens when a person interacts with another one and his or her attention becomes structured by external demands (Csikszentmihalyi. 1997b, p. 42). This study applied the social flow (Csikszentmihalyi, 1997a, 1997b, 2000) concept to construct a model to explain why surfers enjoy online forums and revisit them. In the last part, the model was empirically tested using Thai online forums.

Marketing in the online forums

Set-up objective and the primary forum sites' target

Although there are many assertions about successful indicators of web sites (Dholakia & Rego, 1998; Doren, Fenchner & Green-Adlesderger, 2000; Kiani, 1998; Malik, 2000; Nel *et al.*, 1999; O'Keefe, O'Connor & Kung, 1998), most of them relate it to the set-up objective. A web site that aims to sell products or services online would consider revenues or profits generated from the site as its successful indicator. One that aims to provide company information would look at the number of visitors, page views, or business transactions generated from the web site. In any case, traffic would be the first thing that most forums would expect. In addition to the traffic, the time that visitors spend at the site, depth of their search and navigation patterns through the site, and the return rate, are also important measures for evaluating web-site effectiveness (Hoffman & Novak, 1996b, p. 58). Therefore, the model to be proposed will address all these issues: how to attract surfers to the site, encourage them to stay longer on the site and make them want to come back.

The five-stage model

The five-stage model is asserted as the major activities for online forum marketing: traditional and online marketing activities, visit, interact and revisit. They will be explained in the following section.

Traditional and online marketing activities

Traditional marketing activities stage refers to a mix of promotion activities in traditional media such as newspapers, billboards, television and radio. The main objective is to communicate promotional messages about the web site to audiences. It "will involve an appropriate selection from the range of tools that are available for use as part of the promotional mix" (Rowley, 1998, p. 384). The tools include advertising, direct marketing, sales promotion, public relations and publicity, personal selling and sponsorship. The media for communications to customers will be newspapers, magazines, TV, letterheads, business cards, brochures, packages and so on (Doren *et al.*, 2000, p. 29, Kiani, 1998, p. 193; Peattie & Peters, 1997). According to Schulz, 1999 (p.6), interactive efforts in forums can be increased by printed editions in newspapers and magazines as well.

Online marketing activities stage refers to marketing in the online environment. It is another source that draws visitors to web sites. Marketing activities at this stage include placing advertisements online, registering the web site with search engines, and participating in online communities such as forums, mailing list and newsgroups (Kiani, 1998, p. 191).

Visit, interact, and revisit

When surfers arrive at a web site, it is important that they are encouraged to interact further with it, feel impressed by it, and want to come back. Hoffman and Novak (1996b) and Nel *et al.* (1999) use "flow" concept to explain surfers' behaviours when visiting web sites. Hoffman and Novak (1996b) define flow in a mediated environment as "the state occurring during network navigation which is: 1) characterised by a seamless sequence of responses facilitated by machine interactivity, 2) intrinsically enjoyable, 3) accompanied by a loss of self-consciousness, and 4) self-reinforcing". To experience flow while engaged in an activity, consumers must perceive a balance, which has to be above a critical threshold, between their skills and the challenges of the activity (Hoffman & Novak, 1996b). Consequently, it will lead to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel

et al., 1999, p. 111). An empirical study conducted by Nel *et al.* (1999) reveals that surfers tend to revisit web sites at which they experience higher states of flow.

Flow tends to occur when an individual faces a clear set of goals that require appropriate responses (Csikszentmihalyi, 1997b, p. 29). It "happens when a person's skills are fully involved in overcoming a challenge that is just about manageable, so it acts as a magnet for learning new skills and increasing challenges. If challenges are too low, one gets back to flow by increasing them. If challenges are too great, one can return to the flow state by learning new skills" (Csikszentmihalyi, 1997a, p. 47). The author explains that flow can be created from almost any activity provided the relevant factors are present. Implicit from Csikszentmihalyi's earlier flow concept (Whalen, 1999), Csikszentmihalyi (1997a) proposes a social flow concept.

Social flow happens when a person interacts with another person and his or her attention becomes structured by external demands (Csikszentmihalyi, 1997b, p. 42). "The level of both challenges and skills can grow very high. Thus, interactions have many of the characteristics of flow activities, and they certainly require the orderly investment of mental energy" (Csikszentmihalyi, 1997a, p. 70). Flow can happen in everyday life when one socialises, such as talking or joking with others in a less structured environment (Csikszentmihalyi, 2000). The author named the flow in this case as a microflow and says that it "may be as intrinsically rewarding as deep-flow activities, depending on a person's life situation" (Csikszentmihalyi, 2000, p. 141). However, interaction in this case is more than a basic conversation, it needs one to pay attention, to know and to share the activities of the other person — such as interest, requirements, attention and objective. A "successful interaction involves finding some compatibility between our goals and those of the other person or people, and becoming willing to invest attention in the other person's goals. When these conditions are met, it is possible to experience the flow that comes from optimal interaction" (Csikszentmihalyi, 1997a, p. 70).

Flow and telepresence

In cyberspace, flow needs a proper mediated environment to facilitate it. An online game with better images and response time would make a surfer feel better than one that has less to offer. Steuer (1992) uses a telepresence concept to explain the mediated environment. Telepresence is described as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment. *Telepresence is defined as the experience of presence in an environment by means of a communication medium*" (Steuer, 1992, p. 76). The author states that telepresence can happen in many situations, such as using an electronic bulletin-board system, or driving an animated car in a video game. Each arouses a feeling of telepresence, and the "similar sense can be experienced via virtually any technology used in mediated communication" (Steuer, 1992, p. 79). On the Internet, telepresence make users feel present in another location and the degree to which a person feels telepresence is subject to the technology that allows users to interact with the environment (Shih, 1998, p. 658). Two dimensions affect the degree of telepresence: vividness of sensory information and interactivity of the communication medium (Hoffman & Novak, 1996b; Shih, 1998; Steuer, 1992). Vividness has two important variables that contribute to it: breadth and depth (Steuer, 1992). Breadth refers to the sensory information and depth refers to the quality and amount of the information (Hoffman & Novak, 1996b, p. 61; Shih, 1998, p. 656; Steuer, 1992, pp. 81–84). It is important as it affects people's senses, such as smell, touch and vision in the physical environment. For example, the breadth of print or radio technologies can capture only either the visual or aural sense and is lower than the Internet technologies that can capture both. The depth of a grayscale photograph is lower than that of a colour one (Shih, 1998, Steuer, 1992). Steuer (1992, p. 81) refers to interactivity as "the extent to which users can participate in modifying the form and content of a mediated environment in real time". It is determined by the technological structure of the medium. In telepresence, three factors contribute to interactivity (Steuer, 1992). The first, speed, refers to the rate at which information can pass

through the medium. The rate will directly affect the speed of interaction or response time. Secondly, there is range, the number of possible actions at any given time. Thirdly, mapping refers to how naturally human actions can match changes in the mediated environment. However, Shih (1998) asserts that interactivity can be determined by speed, the reaction time from the media, and control — the degree to which users can modify or control flow of information. Figure 1 illustrates the five-stage model.

Research Questions

This study's general research question, as based on the social flow concept, was: Does social flow positively relate to online forum traffic? In this paper, we are concerned with social flow in Thailand forums in general, as opposed to social flow in a specific forum site. Thus, the goal that may lead to flow is also not specific, as in, for example, going to a forum to find specific information, but rather relates more generally to the process of communicating and sharing ideas within a particular forum session.

The answer to this question does not allow conclusions about exactly what factors contribute to forum traffic. The main goal was to determine forum sites with an environment that facilitates social flow in relation to forum traffic. Adapted from Nel *et al.* (1999), Trevino and Webster (1992) and Csikszentmihalyi (1997a), there are four dimensions that facilitate social flow.

Firstly, there is successful interaction which involves finding some compatibility between our goals and those of the other person or people in the forum, and becoming willing to invest attention in the other person's goals. "When these conditions are met, it is possible to experience the flow that comes from optimal interaction" (Csikszentmihalyi 1997a, p. 70). The number of interactions in each message posted shall determine the surfers' compatibility of goals and willingness to invest attention among them.

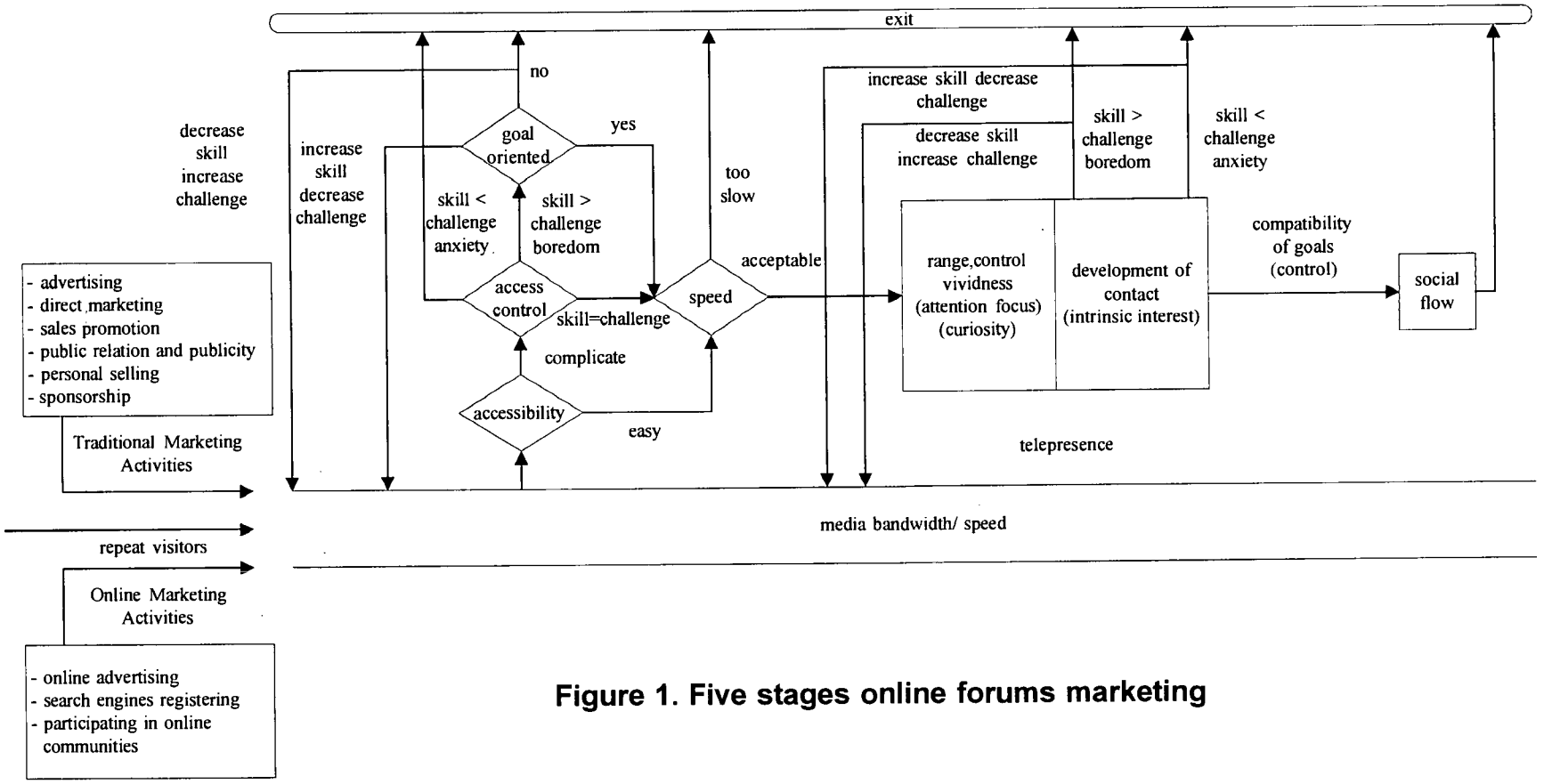

Figure 1. Five stages online forums marketing

Secondly, there is attention focus, when an individual's focus of attention is narrowed toward the interaction or stimulus field, which is the computer screen, while other thoughts are filtered out.

Thirdly, curiosity happens when an individual's sense of curiosity is aroused during interaction with web pages. The headline and number of responses in each message could arouse the curiosity of the surfers so that they decide to read messages inside. Lastly, there is the intrinsic interest or enjoyment that the individual feels from interacting with the medium and the content. This applies to the activities that a person performs with no apparent reinforcement, and regardless of whether he or she will get external rewards, other than the process of performing the activity (Hoffman & Novak, 1996b, p. 61). This is similar in all forums where most surfers participate because of they want to.

As most web forums have a similar design, with headlines for users to click, to view messages inside and allow surfers to respond to others' messages. The difference is mainly in the first dimension with which the specific hypothesis for this study was created:

> H1: The number of responses in each message is positively related to traffic in forum sites.

This hypothesis was created with two main reasons. Firstly, Csikszentmihalyi (1997a, p 70) only asserted, but did not empirically test, for the conditions that might create social flow. According to the author, if all necessary social interactions are met, it is "possible to experience flow that comes from optimal interaction". Secondly, based on an extensive literature review, it was found that the existing research does not discuss in depth social flow experience especially any studies that empirically test social flow in mediated environment. Toward these reasons, the testing of this hypothesis is an important step as it forms the core of most definitions of social flow in online forum discussed previously in the literature.

The next factor that is different in each forum and also affects the traffic is speed of interaction. In cyberspace, flow needs a proper mediated environment to facilitate it. Through the use of the Internet technology, contents are transported across time and space to users in another location in the cyberspace. Therefore, a sense of immediate feedback from interacting with messages can directly influence on flow (Steuer, 1992; Csikszentmihalyi, 1997b, p.30). Based on this concept, the second hypothesis was created:

> H2: Time needed to load content of each forum is negatively related to traffic in forum sites.

Methodology

To gain further insight into this correlation and to obtain systematic data on social flow in online forums, a content analysis of 165 forums in Thailand was sampled and tested. The research replicated the copy point methodology (*see* Appendix I) used in Dholakia and Rego (1998) and O'Keefe *et al.* for categorising and analysing web pages.

The study was limited to Thai forums, partly to simplify the analysis and partly to represent most of the populations of the Thai forums. A list from Siamguru <siamguru.com> directory and search engine web site was chosen as a sampling frame. It is one of the five leading search engines – HotSearch, Catcha, Siamguru, Sanook and Lycos Thai – in Thailand. It also won a Thailand Web Award 2000 and was used as a search engine by Lycos Thailand (Anon 2001). The results from the directory search using "webboard", "forum" and similar key meanings in Thai words were 475 sites. However, after sorting the web sites by name and viewing each forum, only 287 usable sites were found. The rest had problems such as duplicate address, wrong address, forums that did not exits, or were auctions board, a job recruitment boards, or announcement boards. In order to cover seven days and to collect data at least two times on each day, a total of 14

days was used as the period for collection. Topics in the sampled forums were saved into CD-ROM for checking and cross-checking by the researcher and the assistant.

Coding

After a pretest with 20 randomly selected forums, a final version of the coding schemes was prepared, together with coding guidelines. In accordance with the hypothesis, the total number of responses in each message was used to represent the independent variable — social flow. The higher the number of the responses implied the higher the attention in the other person's goals and compatibility of communication. For the traffic, a unit of analysis was the total number of messages posted on the web board during those 14 days. The saved topics in CD-ROM were clicked, downloaded, and skimmed through to find any duplicate messages. If so, the total number of responses was reduced accordingly. However, it was not necessary to read and understand the content. If a web site had many forums, only the first one was chosen. The start and end date to count the total number of messages was based on the date on which the topic was first posted. Counting of the number of responses was done manually without using the running number of each message; this wouldn't work because of, for example, duplicate messages.

While coding, the estimated time needed to download the forum's first page at the speed 28.8 kbps was also collected using Microsoft FrontPage 2000 in order to statistically test for the relationship between forum traffics and sizes.

After a pilot test, the coding was performed independently by the author and the research assistant. An intercoder reliability test for the quantitative variable was used. Both of them discussed and resolved any coding conflict. A simple calculation of percentage agreement between the two coders was 0.94, which is higher than 0.70 criterion commonly suggested for content analysis (Pollay, 1985, pp. 26–37).

Statistical Tools

Since a frequency distribution curve of number of responses shows positive skewed distribution (Figure 2), the Spearman nonparametric correlation was applied for studying the relationship between the variables.

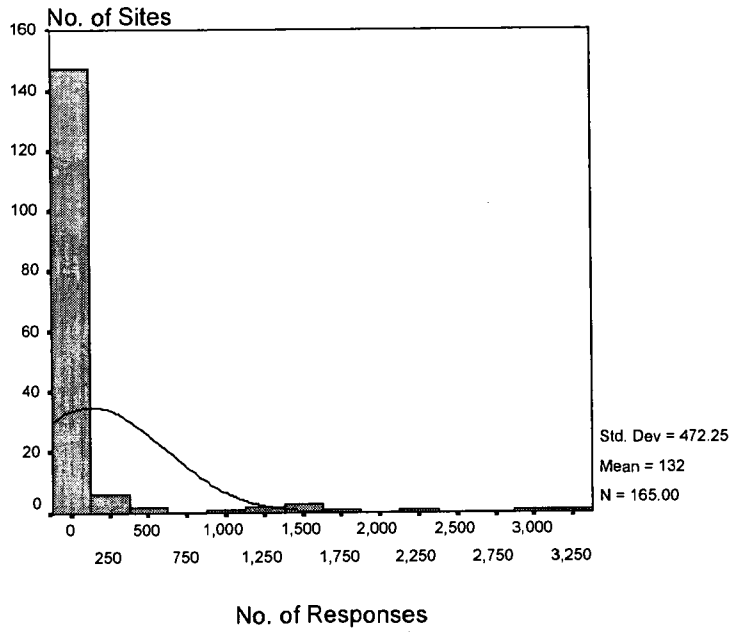

Figure 2: Number of responses distribution curve

Table 1: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MESSAGE	165	0	1,034	27.8667	100.5138
RESPONSE	165	0	3,214	132.1576	472.2521
Valid N (listwise)	165				

Table 2: Number of posted messages and responses correlation

Spearman rho			MESSAGE	RESPONSE
	MESSAGE	Correlation Coefficient	1.000	.854
		Sig. (2-tailed)		0
		N	165	165
	RESPONSE	Correlation Coefficient	.854	1.000
		Sig. (2-tailed)	0	
		N	165	165

Note: Correlation is significant at the .01 level (2-tailed).

Table 3: Number of messages and loading time correlation

Spearman rho			MESSAGE	SECONDS
	MESSAGE	Correlation Coefficient	1.000	.259
		Sig. (2-tailed)		.001
		N	165	162
	SECONDS	Correlation Coefficient	.259	1.000
		Sig. (2-tailed)	0	
		N	162	162

Note: 1) Correlation is significant at the .01 level (2-tailed).
2) Three objects were discarded due to limitation of measurement program.

Analysis of results and discussion

From the coded data, 42 out of 165 sites or 25.45% had neither messages nor responses at all during the two-week period. This implies that most were inactive forums. Up to 125 sites or 75.75% had fewer than 14 messages posted, or less than one message per day on average, during the two week period. The number of responses was also similar as can be seen from its distribution, which is positively skewed as shown in Figure 2. For marketers, it can be seen that online forums need proper attention as there were more failed sites than successful ones.

The Spearman ranked correlation showed that the number of messages posted is positively related to the average number of responses per message. Given the high degree of correlation, it is an indication that the social flow contributes significantly to the traffic in online forums.

In the case of loading speed, the size and design of the web page could not be used to determine the relationship with traffic. Since most of the forums were similarly designed — headline, posted date and number of responses — the relationship between traffic and download speed was positive, as opposed to the rationale that loading time should be negatively related to surfers' preference. Table 3 shows details of the test. In fact, there were only 13 low-traffic forums that needed less than 10 seconds to download, provided the 28.8kbps could be

achieved. According to Neilsen (1997), there are three important limits on the speed of interaction or response time: 0.1 second is about the limit for the user to feel that the system is reacting instantaneously, 1.0 second is about the limit for the user's flow of thought to stay uninterrupted even though the user will notice the delay, and 10 seconds is about the limit for keeping the user's attention focused on the dialogue. The implication from this test, however, shows that, in online forum environment, interactive surfers may be comparatively more important to users than download time. This may be from fact that forum users normally spend most of the time to read and post contents rather than to interact with and expect fast response from the site.

The real accessing speed depended on many factors such as link quality, server performances, and events on that day — for instance, the terrorist attacks on the USA on September 11, 2001 made many servers slow as many people tried to log in to check for the news — and was not covered in the study. It was taken as a constant variable.

The implication from this study is that social flow contributes significantly to the traffic in online forums. Although receivers of messages on the Internet "may or may not move fluidly from their role as audience members to producers of messages" (Morris & Ogan, 1996, p. 42 quoted in Schulz, 1999) in the long run, the study shows that only those forums that are highly interactive are likely to have high traffic. For marketers, an online forum could be another source that drives traffics to a web site. In order to gain more traffic, it is important to understand that an online forum should be a place that enables groups of people who have the same communication objective, which can be categorised by topic, to share ideas and discuss. Since interaction, which helps create social flow, is more than a basic conversation (Csikszentmihalyi, 1997a, p. 70), it is also important that the webmaster encourage surfers to help each other to pay attention, to know and to share the activities of other people, such as interest, requirement, attention and objective. A "successful interaction involves finding some compatibility between our goals and those of the other person or people, and becoming willing to invest attention in the other person's goals. When these

conditions are met, it is possible to experience the flow that comes from optimal interaction" (Csikszentmihalyi, 1997a, p. 70).

As mentioned by (Novak *et al.*, 2000), the marketing concerned with examining these problems in the context of the Internet may be different from the perspective of classical marketing problems, such as choice and decision making, channels strategy, models of customer demand. It has unique characteristics in important ways. For example, communication between seller and buyer has significantly changed. The rich information presented to users in one-way, traditional communication channels such as radio, newspaper or TV is still important but may not be enough anymore. New characteristics, such as interactivity and response speed, have to be seriously considered as well. Therefore, the contributions of this research are perhaps best understood in these differences. "These differences imply the need to understand consumer behavior in an environment in which the rules of consumer engagement may very likely be different (Novak *et al.*, 2000)."

Recommended research areas

In addition to this study, there are research areas recommended for further study. Firstly, as this research was studied by using forum analysis, it is recommended that interview or questionnaire research with the surfers be conducted to find out what makes them impressed and whether or not they feel 'flow' during their visit to an online forum. Secondly, it would also be interesting to conduct an interview survey with experts in this area to find out what makes a forum successful.

Conclusion

An online forum is an Internet activity that can drive traffic to a web site. Although portal sites offer this type of service to their customers with various objectives, their major objective is more traffic to the web sites. Based on social flow theory (Csikszentmihalyi, 1977, 1990, 1997a, 1997b, 2000), this paper conducted an empirical study to find out the relationship between response

messages and traffic in Thai online forums. The result of the study revealed that social flow contributed significantly to the forums' traffic. Based on the results, there are implications to marketers in the area of online forum marketing.

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Appendix I

Literature Review: Copy point methodology

This section will trace back to the original of copy point methodology and will also study related research that uses similar technique in order to gain insight and analyse its weaknesses and strengths.

Resnik and Stern (1977) were the first to use copy point for analysing information content that appeared on TV advertising. The purpose was to empirically investigate the structure of information communicated to the customers through TV media. The methodology used in their study was to set up an evaluation framework to code contents about products, services or institution as illustrated in Table 1a.

Table 1a. Resnik and Stern (1997)'s Evaluative Criteria

Price or value	Packaging or shape
Quality	Guarantees or warranties
Performance	Safety
Components or contents	Nutrition
Availability	Independent research
Special offers	Company-sponsored research
Taste	New ideas

The authors used multi-stage random sampling procedure to select TV advertisements by viewing days, times and the like in order to use them as representative of the population. After that, they recorded the advertisement on videotape in order to play back and code the frequency of the content as set out in Table 1. The authors eventually used the frequency of the contents to analyse the proportion of informative advertisements and type of information content in advertisements in different product classifications. Though this methodology is quite straightforward, the important points, which Resnik and Stern (1977) did not adopt into their coding process, were how the researchers could make sure that their judgment was consistent for all coding processes. In fact, the way to work

around this problem was to have two people code the samples separately and compare them for level of agreement. If they were different, they needed to be resolved by discussion by the research team.

Pollay (1985) also used the same methodology to analyse magazine advertisements over the period from the 1900s to 1970s. The author used an intra-rater, embedded, test-retest percentage agreement scale as the coding technique. The overall reliability, or percentage of agreements on test/retest, intra-rater, embedded repetitions, averaged about 0.94 and was higher than the 0.70 criterion commonly suggested for content analysis (Pollay 1985, pp. 26-37). After that, the coded data was used for the study.

Fay and Currier (1994) conducted a longitudinal study of information content of magazine advertisements in New Zealand. The coding protocol used for this study was also heavily based on Resnik and Stern (1977) and Pollay (1995), but with some extensions and modification of the categories and description as illustrated in Table 2a. The coding process was done by using two trained judges to work independently before testing for the level of agreement. Where results were inconsistent, they were resolved by having a third person to judge.

Table 2a. Fay and Currier (1994)'s Evaluative Criteria

More information	Product variation
Quality	Performance and features
Contents (absent)	Contents present
Availability	Premiums and contests
Nutrition	Packaging and design
Guarantees and warranties	Price
Safety features	Directions for use
Research testimonials and endorsements	Competitive advantage

Dholakia and Rego (1998) conducted a study to test to find the key factor that makes Web pages successful. They set up a hypothesis as follows:

H1: The number of the copy point will be positively related to the daily hit-rate for commercial home pages.

The hit-rate was obtained by using an email survey to webmasters while the copy point was obtained by adapting the copy point coding technique. The criterion for coding information content was adapted from Resnik and Stern (1977), Pollay (1995) and Fay and Currier (1994) with some extension and modification to suit the purposes of the study. Table 3a illustrates the coding criteria. The authors used two people to carry out data-collection and coding. After the coding process, information on both sides was compared to find inter-rater reliability. Where disagreement occurred, it was resolved by discussion between the authors. O'Keefe *et al.* (1998) also used similar coding strategy, as shown in Table 4a.

Table 3a. Dholakia and Rego (1998)'s Evaluative Criteria

Price or value	Special offers, premiums or packaging or shape
Components or contents	Guarantees or warranties
Performance	Safety features
Quality	Nutritional values
Availability	Independent research
Product variations	Specific advantage(s) over competing brands
Directions for use	Approval of product/service from certifying agencies

Table 4a. O'Keefe *et al.* (1998)'s Evaluative Criteria

Provide pricing information	Use a secure server to accept some form of digital cash
Provide significant free information	Are located in virtual malls
Provide a specific contact name, state when last updated	Provide some audio
Provide on-line order forms	Provide some video
Provide for e-mail ordering	Are listed in the Yahoo directory
Provide a phone number	

In summary, there are three important areas in this research methodology: sampling, criterion and reliability. Firstly, the samples have to be representative of the population. Factors such as advertisement time, product categories, segments

of products and the like should be taken into consideration. Secondly, the criteria for coding should be carefully set up to make it clear and practical. Since the coders will have to use this framework to code data, the clearer the description the better the coded result. In addition, the coding criteria should be practical and tested before the real research processes so that it is possible for the team to analyse and code them properly with minimal errors. Lastly, reliability will need to be incorporated into the coding processes. In order to reduce bias and inconsistency in human judgments, it is recommended that there be at least two people in the process. Both of them should code data independently before the results from both sides are compared for level of agreement. This technique will help increase the reliability of this methodology.

Appendix II

Sampled Forums and Coded Information

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://161.246.10.21:8081/s9014391/webboard.pl	9	2	127
http://202.28.38.28/cgi-bin/music/webboard.pl	3	0	295
http://ahoweb.hypermart.net/cgi-bin/board.pl	0	0	30
http://board.dserver.org/cgi-bin/	34	41	20
http://board.dserver.org/n/nontawatn/	1	11	29
http://board.dserver.org/r/rajinibon/	0	0	16
http://sknnet.hypermart.net/cgi-bin/webboard/	24	121	19
http://www.thaimisc.com/cgi-bin/freewebboard/	7	18	34
http://community.thaicast.com/webboard/channel.asp	7	3	249
http://cud19.hypermart.net/wwwboard/wwwboard.html	0	0	37
http://drug.pharmacy.psu.ac.th/rxwb.asp	16	30	42
http://ene-kmutt.hypermart.net/cgi-bin/webboard.pl	24	130	33
http://forum.mweb.co.th/political/index.html	151	1432	33
http://gig.to/entertain/	0	0	14
http://go.to/thaitips	0	0	9
http://xq28.net/z/list.php?f=1	131	1470	48
http://board.thaischool.net/	1	2	23
http://few.zath.net/board/	0	0	9
http://kibkarb1.hypermart.net/cgi-bin/webboard.pl	4	0	97
http://board.dserver.org/g/genesisgang/	5	8	49
http://kosin.com/cgi-kosin/webboard.pl	0	0	170
http://lctpage.hypermart.net/cgi-bin/webboard.pl	0	0	85

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://login.webhostme.com/m15/index.asp	1	3	42
http://measurement.hypermart.net/cgi-bin/webboard.pl	23	53	55
http://www.thaimisc.com/cgi-bin/freewebboard/	0	0	40
http://catch.hypermart.net/cgi-car/webboard.pl	0	0	7
http://my.oa1web.com/smartstock/	0	0	36
http://nakornping.com/cgi-bin/webboard.pl	2	0	50
http://board.dserver.org/t/thaiendzone/index.html	5	17	8
http://www.k-machine.co.th/webboard/index.html	0	0	6
http://board.dserver.org/p/parinya/	1	0	5
http://www.thaimisc.com/cgi-bin/freewebboard/	4	2	39
http://proedtown.com/webboard/index.html	3	1	11
http://rs-nicky.iscool.net/	0	0	47
http://openbk.hypermart.net/my-cgi/bbslist.pl	0	0	155
http://siam.to/seed/	0	0	62
http://smallsoldiers.hypermart.net/cgi-bin/webboard.pl	18	88	38
http://srithai.hypermart.net/cgi-bin/webboard.pl	0	0	43
http://stop.at/powerpat	4	2	39
http://techokyne.bangkokdvd.com/cgi-bin/webboard.pl	1	0	197
http://thaidet.hypermart.net/cgi-bin/webboard.pl	2	0	12
http://members.nbci.com/_XMCM/thaipantae/index.htm	3	26	29
http://www.4blur.f2s.com/indexx.html	1	0	88
http://www.thaimisc.com/cgi-bin/freewebboard/	0	0	25
http://www.landofsmile.com/cgi-bin/board/dcforumlite.cgi	2	1	45
http://users2.cgiforme.com/chanin-r/cfmboard.html	3	0	37
http://users3.cgiforme.com/dolhathai/cfmboard.html	0	0	19
http://www.thaimisc.com/cgi-bin/freewebboard/	6	12	42

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://board.dserver.org/k/korn1536/	10	7	20
http://www.after2k.net/mtgboard/	453	2369	105
http://board.dserver.org/w/webmin/	1	0	6
http://www.baanrak.com/webboard/	2	1	32
http://home.bkknetwork.com/cgi-bin/webboard/	0	0	4
http://www.bkkonline.com/news/	18	138	55
http://www.bluepager.com/board/	1	0	45
http://www.bualumni.or.th/	2	2	22
http://www.catcha.co.th/board/	135	1395	54
http://www.ccc.ac.th/	0	0	89
http://www.centerpoint108.com/webboard/datawebboard.html	28	8	9
http://www.chanthaburi.net/cgi-bin/webboard.pl	6	0	243
http://board.dserver.org/c/chesssiam/	7	15	19
http://www.come.to/variety	0	0	25
http://www.thainux.com/cgi-bin/webboard.pl	17	14	31
http://www.deckmagic.com/	280	1005	66
http://www.dek-d.com/board/	48	312	182
http://www.dltv.th.org/webboard/social.html	0	0	12
http://www.dontreeseason.com/mainwebboard.shtml	10	8	206
http://www.drpunya.com/boardphp/web_board.php3	4	3	37
http://www.etccafe.com/cgi-bin/	7	8	114
http://www.gang4d.com/webboard/webboard.cgi	1	4	24
http://www.sixhead.net/cgi-bin/webboard/	6	17	14
http://www.thaimisc.com/cgi-bin/freewebboard/	0	0	49
http://few.zath.net/board/	0	0	9
http://www.thaiworship.org/mb/wwwboard/index.shtml	19	19	26

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://www.millionmart.com/server/	0	0	21
http://wwwboard.net/bbs1/friends/wwwboard.sht	17	0	21
http://pub41.ezboard.com/bsportscruising	0	0	13
http://www.thaimisc.com/cgi-bin/freewebboard/	2	0	25
http://108nikki.hypermart.net/cgi-bin/board/list.cgi	0	0	23
http://www.thaimisc.com/cgi-bin/freewebboard/	6	13	31
http://board.shinbroadband.com/	102	1232	48
http://www.hotelsthailand.com/cgi-bin/webboard/webboard.pl	4	0	72
http://www.hunsa.com/bbs3/index.shtml	1034	3057	Error
http://www.insitecartoon.com/mbs/webboard.asp	17	17	92
http://www.jedimusic.com/webboard/webboard.asp	37	55	32
http://www.jorjae.com/webboard/mainboard.html	114	7	33
http://board.dserver.org/j/jpopjrock/	30	124	51
http://www.ksu.edu/thai/	1	0	33
http://www.landroverthai.com/	11	24	30
http://lannaupdate.thaiis.com/lanna/dh.shtml	5	7	21
http://www.luckythai.com/games/board/vboard.cgi	2	0	29
http://www.luckythai.com/manutd/board/vboard.cgi	10	26	25
http://www.maama.com/cgi-bin/webboard.pl	0	0	69
http://www.maejo.com/	2	1	23
http://www.meetingmall.com/cgi-bin/forum/board/	7	23	26
http://www.midnightthailand.com/	478	3214	119
http://www.movieseer.com/forum/	9	65	39
http://www.naijiw.com/cgi-bin/webboard.pl	11	3	45
http://www.nakornphanom.com/	3	0	93
http://www.netengtel.com/webboard/main.asp?forumID=1	0	0	12

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://www.netsiam.com/wwwboard/general/	12	3	Error
http://www.nisith.com/webboard/allboard.asp	5	0	27
http://www.nitade.net/chula/	19	287	67
http://www.nothaksin.com/	4	7	21
http://www.omyim.com/linux/www/	0	0	Error
http://www.paknam.org/cgi-bin/webboard.pl	0	0	21
http://www.petgang.com/kratoo/main.asp	11	10	22
http://www.politicsthailand.com/cgi-bin/webboard/social/socialview.pl	4	11	28
http://www.pop.co.th/	0	0	160
http://www.powellcomputer.com/support/techweb/public/TechWeb.asp	0	0	47
http://forum.th2.net/webboard.asp?board=0180	0	0	35
http://pta.phpwebhosting.com/clinic.phtml	4	7	51
http://www.quamruq.com/feeling2001.html	111	1194	125
http://www.radioshowthailand.com/board1/	1	32	32
http://www.healthnet.in.th/cyber_board/index.html	1	0	70
http://ns.risurin.ac.th/board/	23	19	23
http://www.sabye.com/hooligan/	0	0	101
http://www.samutsakorn.com/main.html	0	0	36
http://www.se-ed.com/webboard/	174	435	103
http://www.siamanimal.com/cgi-bin/webboard.pl	44	11	57
http://www.siamhyper.com/board/cgi-bin/webboard.pl	3	0	44
http://www.siamlaw.com/webboard/	66	92	32
http://www.siranee.com/cgi-bin/ubb/	1	1	56
http://www.smoodtai.com/cgi-smoodtai/webboard.pl	2	15	19
http://www.tanglad.com/cgi-bin/webboard.pl	1	0	18

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://www20.brinkster.com/entboard/index.asp	3	0	24
http://www.teenet.chula.ac.th/forum/	9	12	58
http://www.thai.net/bikelove/	66	511	73
http://www.thai.net/boonting	3	4	13
http://board.dserver.org/s/s4u/	1	2	6
http://www.thaiantiquecar.com/	0	0	22
http://www.thaibondfocus.com/Thai_Bond_Forum/	0	0	31
http://www.thaicivil.com/globaldata/webboard/	7	15	39
http://www.thaigameonline.com/gamer/index.html	34	31	40
http://www.pramool.com/webboard/	27	124	74
http://www.thaihostsearch.com/webboard/index.asp	9	28	54
http://www.thaihvac.com/webboard/	32	35	61
http://www.thaimax.cjb.net/	10	4	68
http://www.thaimisc.com/forum/	1	0	26
http://www.thaimisc.com/cgi-bin/freewebboard/	0	0	38
http://www.thaipalmer.com/cgi-bin/forum/board.pl	13	8	43
http://www.thaipoint.com/cgi-bin/gamewebboard.cgi	16	14	2171
http://www.thaipun.com/webboard/herbs_webboard.asp	3	1	12
http://www2.thaismartkids.org/wb/html/map.htm	0	0	16
http://www.thaitopic.com/wb1/webboard.pl	15	71	104
http://www.thaiunity.com/webboard.asp	4	5	76
http://board.thaiware.com/new/list.php?f=9	1	0	9
http://www.thaiwriter.net/cgi-bin/webboard.pl	33	135	37
http://my.thaimail.com/mywebboard	0	0	41
http://www.thummai.com/	2	2	51
http://www.todaylove.cjb.net/	0	0	128

Forum Address	No. of Message Posted	No. of Interactive Message	Content Loading Time (Sec)
http://www.tat.or.th/thai/cgi-bin/board_list.pl	142	193	34
http://www.udon-thani.com/mm-board.html	2	0	93
http://www.udonthani.com/cgi-bin/webboard3.pl	9	2	66
http://www.varasarn.com/webboard/index.shtml	174	1802	65
http://www.voicethai.com/search.php?topic=41	1	0	44
http://forum.th2.net/webboard.asp?board=1100	2	4	65
http://www.webthaithai.com/body/	13	12	141
http://www.wphat.com/cgi-bin/webboard/	0	0	89
http://www.wwwboard.net/bbs1/friends/wwwboard.sht	17	0	21
http://www.yaso.a-net.net.th/webboard/	0	0	26
http://www.yugyig.com/	6	0	23
http://www.zodazone.com/	2	1	6
http://www1.clickta.com/webboard/	2	0	107
http://wwwboard.net/bbs1/nuisance2/wwwboard.sht	0	0	21

DBA Research Paper 3

Factors influencing online gamer experience: An empirical study using Experience Sampling Method

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Submitted on this 20th of December in the year 2002
For the partial requirement of the degree of
Doctor of Business Administration

"I hereby declare that this paper submitted in partial fulfillment of the DBA degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that it dose not constitute any previous work whether published of otherwise. In making this declaration, I understand and acknowledge any breaches of the declaration constitute academic misconduct which may result in my expulsion from the programme and/or exclusion from the award of the degree".

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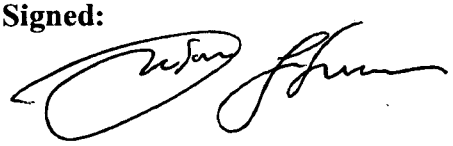

Anusorn Saosaovaphak
Date: 20 December 2002

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Factors influencing online gamer experience: An empirical study using Experience Sampling Method

Abstract

An empirical study was conducted in this research to find the factors contributing to online gamer experience in a real playing environment. Online game technologies have been changing continually. They keep improving game capabilities such as graphics, sound, and speed. They also allow gamers to play with computers, friends, and people around the world via Internet networks. Nowadays, many Internet portal sites are using them as a tool to attract customers to their web sites. Because of these changes, it is important for marketers in the field to understand gamer behaviour in these new environments. A model framework has been constructed and empirically tested to find out the factors that make gamers feel they would like to interact with the game, stay a long time with it, and play it repeatedly. All these — high traffic, time spent at the site and return rate — are primary objectives for most portal web sites. The study used Experience Sampling Method which requires data to be collected from online game players while they are playing an online game in their normal environment. Game arcades (Internet cafés) in Bangkok were the places chosen by this study to collect data for the research. A quantitative model using Structural Equation Modelling was used to test the fitness of the model with collected data. The results of this study should contribute to theoretical and practical knowledge in related industries, as it will reveal the factors that make players impressed with the online games.

Introduction

The aim of this research was to conduct an empirical test to find out the factors affecting online gamer experience. In particular, the extent to which they contribute to player experience was measured. Online games have become one of the services that many portal web sites such as Yahoo! and America Online offer to surfers. They keep players coming

back and spending a long time with them. In fact, one of them is the stickiest site on the web (Jupiter Media Metrix Inc cited in Crockett, 2001).

The Internet has unique characteristics that differentiate it from traditional marketing media in many ways. For example, a gamer can interact not only with the game and other gamers, but also with the mediated environment through computers and related devices. These differences imply the need to understand players' behaviour in the environment they are experiencing. An intensive literature review was conducted, and it was found that the existing research does not discuss in depth gamer experience while playing an online game, especially any studies that observe players playing in a real environment. Since it is difficult, if not impossible, to collect data from players who play an online game in the real Internet environment around the world, this study use Internet cafés which allow players to play the same online games but under a Local Area Network (LAN) environment. The LAN environment normally has a faster speed than the Internet one. The result of this study should contribute to the theoretical and practical knowledge that marketers need to consider in their online marketing strategies.

Game Web Site Marketing

Set-up objective and the primary game sites' target

Although there are many assertions about successful indicators of web sites (Dholakia & Rego, 1998; Doren, Fenchner & Green-Adlesderger, 2000; Kiani, 1998; Malik, 2000; Nel *et al.*, 1999; O'Keefe, O'Connor & Kung, 1998), most of them relate it to the set-up objective. A web site that aims to sell products or services online would consider revenues or profits generated from the site as its successful indicator. One that aims to provide company information would look at the number of visitors, page views, or business transactions generated from the web site. In any case, traffic would be the first thing that most sites would expect. In addition to the traffic, the time that visitors spend at the site, depth of their search and navigation patterns through the site, and the return rate, are also important measures for evaluating web-site effectiveness (Hoffman & Novak, 1996b, p. 58). Therefore, the model to be proposed will address all these issues: how to attract surfers to the site, encourage them to stay longer on the site and make them want to come back.

The five-stage model

The five-stage model is asserted as the major activities for online game marketing: traditional and online marketing activities, visit, interact and revisit. They will be explained in the following section.

Traditional and online marketing activities

Traditional marketing activities stage refers to a mix of promotion activities in traditional media such as newspapers, billboards, television and radio. The main objective is to communicate promotional messages about the web site to audiences. It "will involve an appropriate selection from the range of tools that are available for use as part of the promotional mix" (Rowley, 1998, p. 384). The tools include advertising, direct marketing, sales promotion, public relations and publicity, personal selling and sponsorship. The media for communications to customers will be newspapers, magazines, TV, letterheads, business cards, brochures, packages and so on (Doren *et al.*, 2000, p. 29, Kiani, 1998, p. 193; Peattie & Peters, 1997).

Online marketing activities stage refers to marketing in the online environment. It is another source that draws visitors to web sites. Marketing activities at this stage include placing advertisements online, registering the web site with search engines, and participating in online communities such as forums, mailing list and newsgroups (Kiani, 1998, p. 191).

Visit, interact, and revisit

When surfers arrive at a web site, it is important that they are encouraged to interact further with it, feel impressed by it, and want to come back. In this paper, a model framework was constructed, and used to explain and empirically tested to find out how to make a gamer feel interested in an online game, play it for longer and want to play it repeatedly. The model was based on Flow theory (Csikszentmihalyi, 1997a, 1997b, 2000), telepresence (Steuer, 1992) and computer-mediated environment (Hoffman & Novak, 1996) concepts. Flow is the process of optimal experience (Csikszentmihalyi, 1977a) "preceded by a set of antecedent conditions necessary for the experience to be achieved and followed by a

set of consequences that occurs as a result of the process" (Hoffman & Novak 1996, p. 57). It leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel, Niekerk, Berthon & Davies, 1999, p. 111).

Based on the last three stages, a model framework was constructed, and used to explain and empirically tested to find out how to make a gamer feel interested in an online game, play it for longer and want to play it repeatedly. It was based on Flow theory (Csikszentmihalyi, 1997a, 1997b, 2000), telepresence (Steuer, 1992) and computer-mediated environment (Hoffman & Novak, 1996) concepts. Flow is the process of optimal experience (Csikszentmihalyi, 1977a) "preceded by a set of antecedent conditions necessary for the experience to be achieved and followed by a set of consequences that occurs as a result of the process" (Hoffman & Novak 1996, p. 57). It leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel, Niekerk, Berthon & Davies, 1999, p. 111). The flow concept has been applied in many computer human interactions and Internet marketing studies (Ghani & Deshpande, 1994; Hoffman & Novak, 1996; Nel *et al.*, 1999; Wieber & Kollmann, 1998). However, "flow in play", which happens when an individual plays sports or games, was neither discussed in depth nor empirically tested. This study applied the flow in play (Csikszentmihalyi, 1997a, 1997b, 2000) concept to construct a model to explain why surfers enjoy playing an online game and wanted to play it repeatedly. The model was empirically tested by using information collected from players in Internet cafés in Bangkok, using the Experience Sampling Method (ESM) (Kubey, Larson & Csikszentmihalyi, 1996), which requires a researcher to collect data from subjects while they are performing their activities in a natural environment.

Literature Review

Flow is the process of optimal experience (Csikszentmihalyi, 1977; Csikszentmihalyi & LeFevre, 1989, p. 816 quoted in Hoffman & Novak, 1996, p. 57). It tends to occur when an individual faces a clear set of goals that require appropriate responses (Csikszentmihalyi 1997b, p.29). It "happens when a person's skills are fully involved in overcoming a challenge that is just about manageable, so it acts as a magnet for learning new skills and

increasing challenges. If challenges are too low, one gets back to flow by increasing them. If challenges are too great, one can return to the flow state by learning new skills" (Csikszentmihalyi, 1997a, p. 47). The author explains that flow can be created from almost any activity provided the relevant factors are present. Implicit from Csikszentmihalyi's earlier flow concept (Whalen, 1999), Csikszentmihalyi (1997a) categorises and describes activities in three broad areas: flow at work, flow at play and social flow.

Flow at play can happen more easily than other types of flow as it has a clear set of rules and regulations (Csikszentmihalyi, 1997a). Leisure time, such as playing sport or games, watching TV, hobbies, and going to restaurants and movies, can be categorised as activities which include: media consumption, conversation and active leisure (Csikszentmihalyi, 1997a, p. 48). Each requires an initial investment to overcome possible obstructions, such as not understanding the rules of a game, not knowing how to control equipment, or having to go to a particular place to play sport. Evidence shows that people spend more time watching TV than on other hobbies or sports, despite having less flow, since TV is more accessible than the others, and therefore, "If a person is too tired, anxious, or lacks discipline to overcome the initial obstacle, he or she will have to settle for something that, although less enjoyable, is more accessible" (Csikszentmihalyi, 1997a, p. 48).

In the computer-mediated environment, there are two stages involved in the development of flow. First, a surfer needs to undertake the necessary procedures required to enter the web site. Flow cannot be taken for granted, and effort or accessibility is the important factor that one has to invest. Secondly, through the use of Internet technology, users are transported across time and space to another location in cyberspace. They feel a sense of being present in a virtual environment and can interact with it as if they were in the real world.

There are four dimensions that facilitate flow (Nel *et al.*, 1999; Trevino & Webster, 1992). Firstly, there is control, which refers to the individual's perceived sense of control over the activity performed. Secondly, there is attention focus, that occurs when an individual's focus of attention is narrowed toward the interaction or stimulus field, which is a computer screen, while other thoughts are filtered out. Thirdly, curiosity happens when an individual's sense of curiosity is aroused during interaction with web

pages. Lastly, there is the intrinsic interest or enjoyment that the individual feels from interacting with the medium and the content.

In cyberspace, flow needs a telepresence to facilitate it. Telepresence is described as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment. *Telepresence is defined as the experience of presence in an environment by means of a communication medium*" (Steuer, 1992, p. 76). Two dimensions affect the degree of telepresence: vividness of sensory information and interactivity of the communication medium. Vividness has two important variables that contribute to it: breadth and depth. Breadth refers to the sensory information and depth refers to the quality and amount of the information (Hoffman & Novak, 1996b, p. 61; Shih, 1998, p. 656; Steuer, 1992, pp. 81–84). This is important as it affects people's senses, such as smell, touch and vision, in the physical environment. For example, the breadth of the print or radio technologies can capture only the visual or aural sense and is lower than the Internet technologies that can capture both, and the depth of a greyscale photograph is lower than that of a colour one (Shih, 1998, Steuer, 1992). Steuer (1992, p. 81) refers to interactivity as "the extent to which users can participate in modifying the form and content of a mediated environment in real time". It is determined by the technological structure of the medium. In telepresence, three factors contribute to interactivity. The first, speed, refers to the rate at which information can pass through the medium. The rate will directly affect the speed of interaction or response time. Secondly, there is range, the number of possible actions at any given time. Thirdly, mapping refers to how naturally human actions can match changes in the mediated environment. However, Shih (1998) asserts that interactivity can be determined by speed, the reaction time from the media, and control, which is the degree to which users can modify or control flow of information. Figure 1 illustrates the flow in play in a computer-mediated environment model.

Research Questions

This study's general research questions, based on the proposed model framework in Figure 1, were:

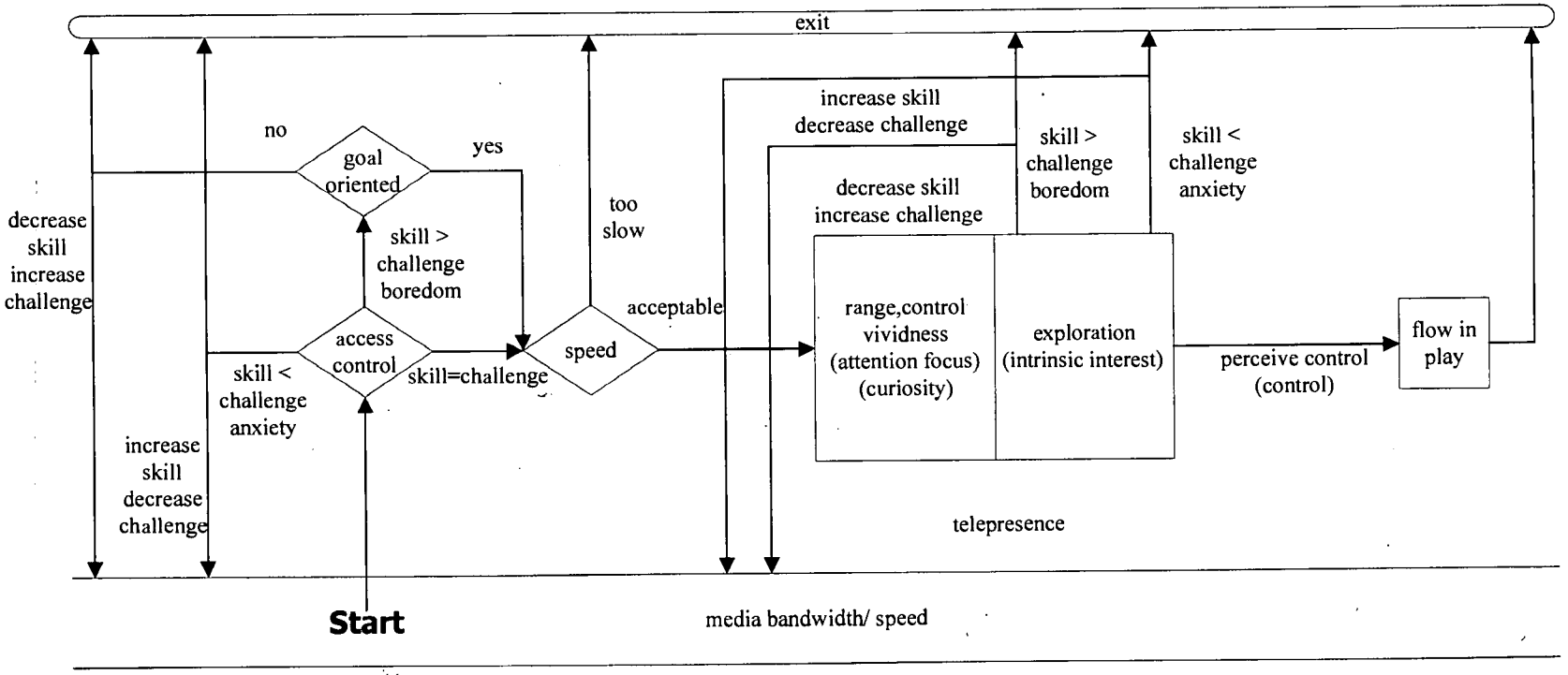

Figure 1: Theoretical model of flow in play

H1: Congruence of skills and challenges has a positive relationship with flow.

Congruence between skills and challenges is the primary antecedent of flow. A gamer must perceive the congruency between these two at a level above a critical threshold. Skills in this case are defined as the player's abilities to control the computer and to play the game against the opponent, and challenge as the opportunities for action available to the players and the skills of the opponents in the online environment. When players perceive the challenges of the game and play a match with their own skills, then flow will potentially occur. If challenges are too low, a gamer might become bored and exit the game or get back to flow by increasing the activity within. If challenges are too great, a gamer might feel anxious and exit the game or return to the flow state by learning new skills, or select a less challenging game level.

H2: Focused attention has a positive relationship with flow.

Focused attention is an antecedent condition necessary for the flow state to be experienced (Hoffman & Novak, 1996, p. 60). It is characterised as "a centering of attention on a limited stimulus field (Csikszentmihalyi, 1977)". In flow state, the player's attention is narrowed to a limited stimulus field, and irrelevant thoughts are filtered out. Players become engrossed in playing the game while increasing their awareness of their own mental processes (Csikszentmihalyi, 2000). In this case, the computer screen can serve as the limited stimulus field. According to Webster *et al.* (1993), it is the point that respondents reported as the focus of attention during their computer-mediated interactions.

H3: Curiosity has a positive relationship with flow.

Curiosity happens when an individual's sense of curiosity is aroused during interaction with the online game. Therefore, adding game content that encourages players to explore the game more would probably increase the time players spent on the game. A

sense of curiosity is asserted to facilitate flow (Nel *et al.*, 1999; Trevino & Webster, 1992).

H4: Intrinsic interest has a positive relationship with flow.

The intrinsic interest or enjoyment that the individual feels from interacting with the medium and the content is one of the dimensions necessary for flow to be created (Nel *et al.*, 1999; Trevino & Webster, 1992). Players play the game not just to get something done, but also for their own pleasure. They enjoy the interaction with the medium, which is the computer equipment and the game content. Thus there is intrinsic interest as well as satisfaction (Nel *et al.*, 1993).

H5: Stimulus has a positive relationship with flow.

Flow in the computer-mediated environment requires not only the congruence of skills and challenges but also an above-threshold level of stimulus. While people with low stimulus tend to experience anxiety in the beginning stage of interaction with the environment, those who have already mastered the basics required for interacting with the medium tend to have high stimulus (Hoffman & Novak, 1996, p. 61).

H6: Telepresence has a positive relationship with flow.

Hoffman and Novak (1996) introduced this concept as an antecedent of flow. The Telepresence concept was based on Steuer (1992) which was described as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment". This study did not test its relationships with speed, range, control, and vividness as they have already been tested in previous studies (Steuer, 1992; Novak, Hoffman, & Yung, 2000).

Methodology

The model was empirically tested using Experience Sampling Method (ESM) (Kubey, Larson & Csikszentmihalyi, 1996; Csikszentmihalyi, 1997a, p.15) using data collected from gamers in Internet cafés in Bangkok as subjects for the study. ESM provides a way of getting detailed data about important subjective elements of subjects when they are performing their natural activities. It is one of the tools of choice for inquiries into systematic phenomenology. The method has been applied to an increasing number of research problems in medicine, the social sciences, and communication (Kubey *et al.*, 1996).

During January 15–February 15, 2002, 120 subjects were randomly selected from gamers playing an online game in two Internet cafés in Bangkok. Since the study was similar to a controlled experiment in a laboratory but using subjects when they are performing their natural activities, the criterion for choosing the places was mainly based on the corporation of the owners. All the survey responses were only from those players playing an online game. An online game in this study refers to any game that can have more than two players jointly playing it together over a network. Those players who played an online game with the computer were also included in the study. In total, 108 questionnaires were returned, but only 103 were usable. As there were in total seven measured variables in the model, therefore, the number of subjects was close to the recommended 15 subjects per measured variables (Stevens, 1996 cited in Statistical Support, 2001).

As part of the Experience Sampling Method methodology, the subjects were invited to participate in the questionnaire survey after they had played a game for at least half an hour. Those interested in participating in the study were also offered a voucher to play a game for one hour (worth 0.55 USD) free of charge. There were no exclusion criteria for selection of the subjects, unless they themselves refused.

Since the survey was conducted over a two-week period, the research assistants had to remember the subjects who had already answered the questionnaire survey in order to avoid duplication. Respondents were asked questions about their feelings while playing an online game. The questionnaire (*see* Appendix I) measured challenge, skill, stimulus, curiosity, focus attention, telepresence, and flow. As the proposed model was

associated with multidimensional factors, many questions were closely related. Therefore, the questionnaire, which was adapted from Nel *et al.* (1999), Novak *et al.* (2000), Ghani & Deshpande (1994), and Trevino & Webster (1992), was developed over the series of pretests and pilots until no respondent expressed confusion about the it.

The final questionnaire contained 13 questions, each rated on a 7-point Likert scale. The reliability of the data, measured by Cronbach's alpha, was 0.8055, better than the 0.8 "acceptable" value in most Social Science applications (UCLA Academic Technology Service, 2001).

Statistical Tools

The hypotheses were tested as a set by using a Structural Equation Modelling (SEM) technique. This statistical technique has advantages over regression analysis in that it allows the simultaneous estimation of coefficients (Maruyama & McGarvey, 1980 cited in Trevino & Webster, 1992). It also encompasses other techniques such as path analysis, confirmatory factor analysis, causal modelling with latent variables and analysis of variance and multiple linear regression (Statistical Support, 2001). This technique has become more popular especially for analysis of social data as it can locate "specification errors, detecting the improper inclusion of or misplacement of variables within a causally related network, and, in general, determining how closely a hypothesised model fits actual data (Ghani & Deshpande, 1994)." It also provides an opportunity for marketing researchers to hypothesise, and statistically test, market behaviour models (MacLean & Gray, 1998). This technique was also used in previous studies related to flow in computer-mediated environments such as Trevino and Webster (1992), Ghani and Desppande (1994) and Novak *et al.* (2000).

AMOS (Analysis of Moment Structures) software version 4 was used for the test. It provides data analysis known as structural modelling, analysis of covariance structures, or causal modelling. It includes many well-known techniques such as general linear model and common factor analysis.

Results

Theoretical Model

Based on Figure 1, the Structural Equation Modelling (SEM) hypothesis is set as:

H0: The model fits data

H1: The model does not fit data

Figure 2 shows the diagram of the proposed model with standardised regression weight values generated by AMOS 4. In SEM, ovals or circles represent latent variables, while rectangles or squares represent measured variables. Residuals are always unobserved, so are represented by ovals or circles. Also, correlations and covariances are represented by bi-directional arrows, which represent relationships without an explicitly defined causal direction. Causal effects are represented by single-headed arrows in the path diagram (Statistical Support, 2001). Latent variables refer to those that indicate abstract concepts or theoretical constructs. They cannot be, or are only with difficulty, directly measured. They are taken for granted as being true in the absence of tools to measure them. "That is, they are presumed to underlie what can be observed, in the sense that the latent variables directly influence the outcome or values taken by the observed variables (MacLean, 1998)." Statistical values in detail are given in the table below.

Table 1 - Summary of statistic: Theoretical Model

Chi-square	40.908
Degree of freedom	8
Probability Level	0
Goodness-of-Fit Index (GFI)	0.909
Adjusted-Goodness-of-Fit Index (AGFI)	0.683
Confirmatory Fit Index (CFI)	0.876
Root Mean Square Error of Approximating Fit Statistic (RMSEA)	0.201
Tucker-Lewis Index (TLI)	0.676

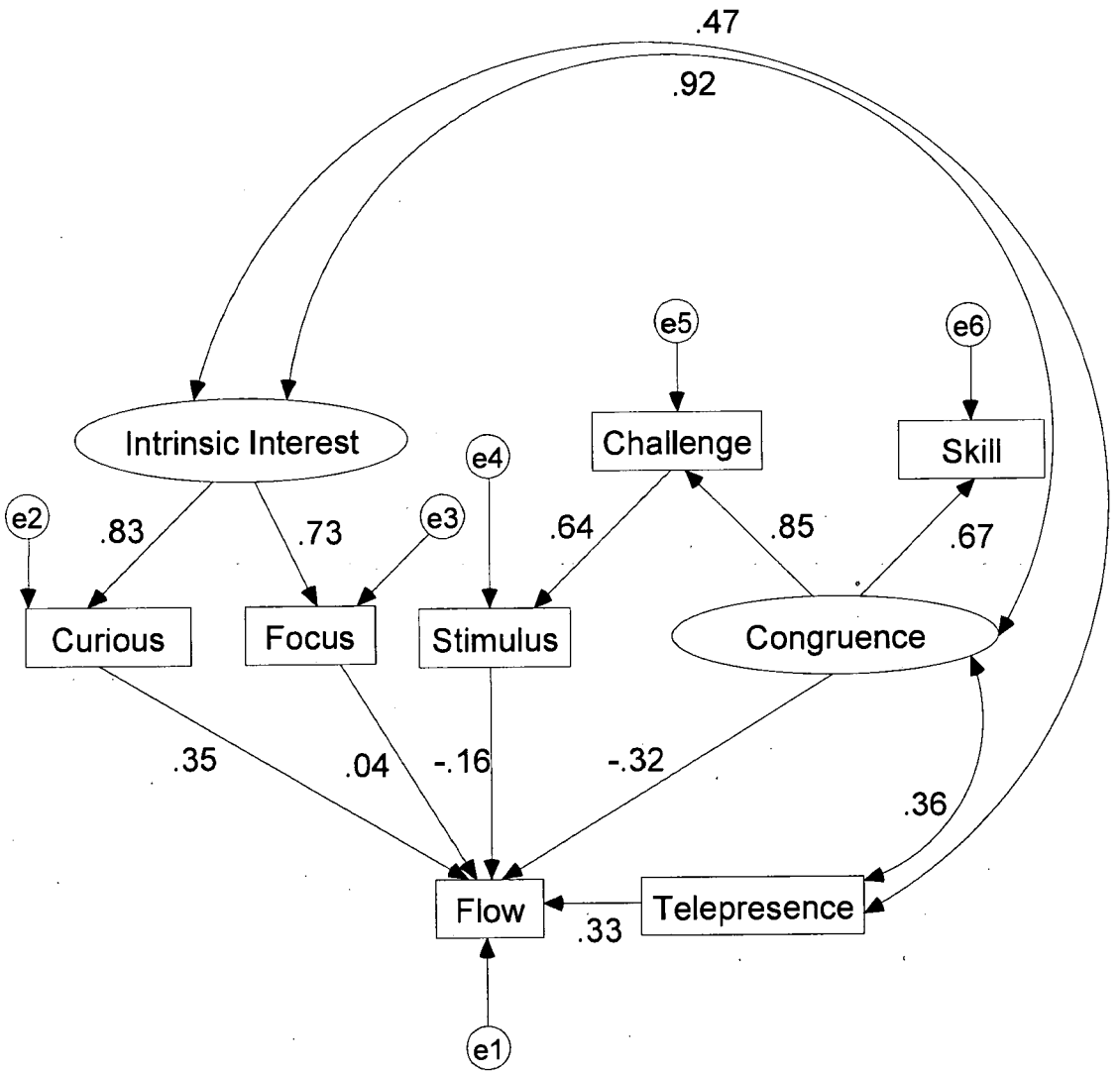

Figure 2: Results of Theoretical Flow In Play Model

Table 2 – Unstandardised Regression Weights of Theoretical Model

Regression Weights (Unstandardised Estimates):	Estimate	S.E.	C.R.
Challenge← Congruence	1.408	0.217	6.486
Focus ← Intrinsic Interest	1.000		
Curious ← Intrinsic Interest	1.232	0.168	7.329
Stimulus ← Challenge	0.708	0.083	8.503
Control ← Congruence	1.000		
Flow ← Curious	0.489	0.240	2.039
Flow ← Congruence	-0.748	0.587	-1.273
Flow ← Telepresence	0.487	0.147	3.312
Flow ← Stimulus	-0.211	0.147	-1.434
Flow ← Focus	0.068	0.207	0.329

The chi-square value of 40.908 with 8 degrees of freedom is significant at the .05 level: its *p*-value is 0. Unlike other statistical methods, SEM can never be accepted. The statistical result fails to reject the hypothesis H1. That means that the proposed theoretical model does not fit well with the data collected and should be revised. This finding suggests that the model does not globally fit the population from which the data is collected.

Significant Tests of Individual Parameters

When determining adjusted-goodness-of-fit index (AGFI), the value of 0.683 (unadjusted = 0.909) is relatively low to be considered as indicating a satisfactory fit. However, for the Root Mean Square Error of Approximating (RMSEA) fit statistic — the obtained value of .201 is well below the value of about .08, indicating a reasonable error of approximation (Browne & Cudeck, 1993). When considering the Tucker-Lewis Index (TLI), the result of .676 is much lower than the .95 threshold (Hu & Bentler, 1999 cited in Statistical Support, 2001) denoting an unsatisfactory model fit. Lastly, the confirmatory fit index (CFI) of 0.876 is also lower than the minimum value of 0.9 (Bentler, 1990) as indicative of good model fit.

The standardised regression weight values are shown in Figure 2 and the unstandardised values are in Table 2. For unstandardised regression weight, relationship between Challenge & Congruence, Curious & Intrinsic Interest, Stimulus & Challenge,

Flow & Curious and Flow & Telepresence indicate that they are significantly different from zero at the .05 level (Critical ratio of 6.486, 7.329, 8.503, 2.039 and 3.312 respectively) while the others are not significant. These results were derived by defining Congruence and Intrinsic Interest as latent variables and restricting regression weight between Focus & Intrinsic Interest and Control & Congruence to one. In this study, Intrinsic Interest was defined as a latent variable due to its abstract concept as it happens as an antecedent dimension of flow which may or may not occur at the same time with the other dimensions. It was also defined as a condition in flow state (Trevino *et al.*, 1992; Nel *et al.*, 1999). The other latent variable includes the perceived congruence between the skills and challenges of the interaction which can vary along the process and make it difficult to be measured at a period of time.

By determining the relationship of the factors that have a significant relationship with flow, it was found that the relationship of congruence and stimulus with flow have negative relationships. The reasons for this might be affected by the period that this survey was conducted — January 2002. At that time, most of the online games such as Counter Strike, Red Alert or Star Craft had been in the market for more than a year and probably had already come to the end of their product life cycle. Players who play the games had already played them many times and might not feel that they were no longer challenging. A similar result was also found in Ghani and Deshpande (1994)'s study, which showed a negative relationship between computer skill and flow. According to the author, it happened because of high average computer skill in the sample. They did not feel that using the computer was challenging any more. The same evidence was also found in some other previous studies (Ghani & Deshpande, 1994).

As the first theoretical results did not globally fit with the data, it was revised with respect to the conceptual implication. By using modification indices generated by the program, the expected reduction in the overall model fit chi-square for each possible path that can be added to the model can be calculated (see more details in Statistical Support, 2001). Figure 3 and the following section are the results generated from the program.

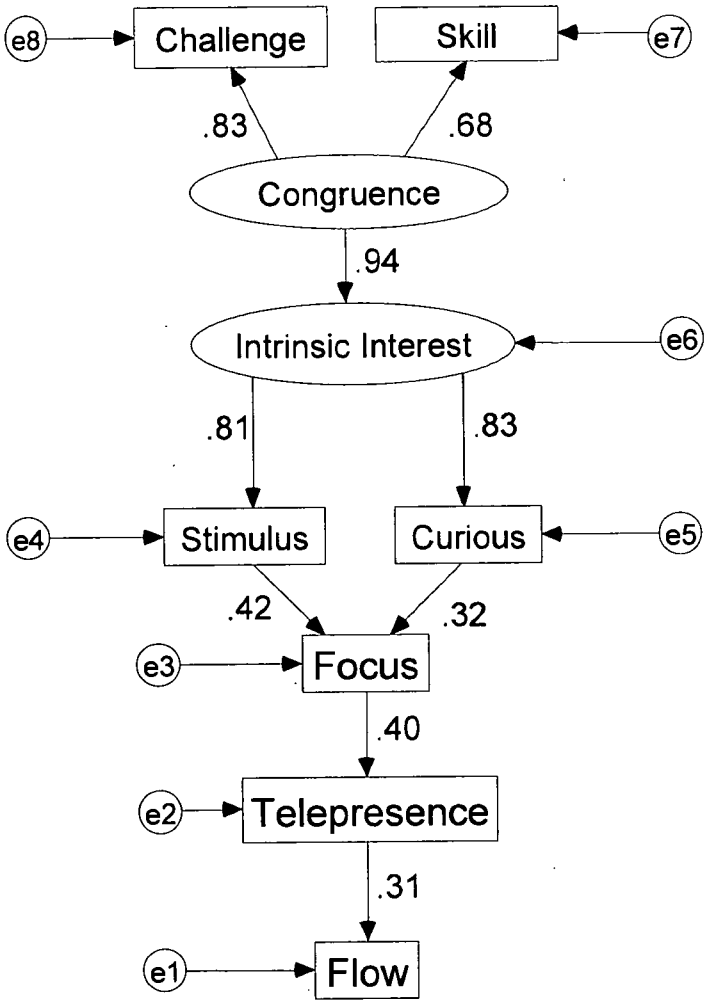

Figure 3: Result of Revised Flow in Play Model

Table 3 - Summary of statistics: Revised Model

Chi-square	16.799
Degree of freedom	12
Probability Level	0.157
Goodness-of-Fit Index (GFI)	0.957
Adjusted-Goodness-of-Fit Index (AGFI)	0.901
Confirmatory Fit Index (CFI)	0.982
Root Mean Square Error of Approximating Fit Statistic (RMSEA)	0.063
Tucker-Lewis Index (TLI)	0.969

Table 4 – Unstandardised Regression Weights of Revised Model

Regression Weights: (Unstandardised Estimates)	Estimate	S.E.	C.R.
Intrinsic Interest ← Congruence	1.298	0.204	6.350
Stimulus ← Intrinsic Interest	1.052	0.125	8.396
Curious ← Intrinsic Interest	1.000		
Focus ← Stimulus	0.355	0.084	4.244
Focus ← Curious	0.297	0.091	3.269
Telepresence ← Focus	0.408	0.093	4.377
Challenge← Congruence	1.353	0.200	6.769
Flow ← Telepresence	0.447	0.136	3.284
Control ← Congruence	1.000		

The revised model returns the Chi-square value of 16.799 with degree of freedom 12 and probability level of 0.157. That means the hypothesis that the model does not fit data is rejected and the null hypothesis that the model fits data is accepted. It is supported by the high value of adjusted-goodness-of-fit index (AGFI) of 0.901 (unadjusted = 0.957) considered as indicating a satisfactory fit. Corroborating evidence is provided by the Root Mean Square Error of Approximating (RMSEA) fit statistic – the obtained value of .063 is well below the value of about .08 indicating a reasonable error of approximation (Browne & Cudeck, 1993). Similarly, the Tucker-Lewis Index (TLI) result of .969 is considerably above the .95 threshold (Hu & Bentler, 1999 cited in Statistical Support, 2001) denoting

satisfactory model fit. Lastly, the confirmatory fit index (CFI) of 0.982 is also higher than the minimum value of 0.9 (Bentler, 1990) as indicative of good model fit.

The standardised regression weight values are shown in Figure 3 and the unstandardised figures are in Table 2. For the unstandardised regression weight, by defining Congruence and Intrinsic Interest as latent variables and restricting regression weight between Curious & Intrinsic Interest and Control & Congruence to one, the relationships between variables in table 4 are all significantly different from zero at 0.05 level. The unstandardised regression weight between Intrinsic Interest & Congruence, Stimulus & Intrinsic Interest, Focus & Stimulus, Focus & Curious, Telepresence & Focus, Challenge & Congruence and Flow & Telepresence are 6.350, 8.396, 4.244, 3.269, 4.377, 6.769 and 3.284 respectively.

Discussion

The purpose of this study was to empirically test the major factors believed to influence the flow experience of gamers in online environments. Figure 3 illustrates the results from the program. From the outcomes, Congruency of Skill & Challenge was found to positively relate to Intrinsic Interest, which facilitated the senses of curiosity and stimulus feel. These two latter factors then helped players stay focused on the computer screen and the game they played. Once the four dimensions were achieved, through the mediated environment, they facilitated telepresence to make the gamer experience flow. The result was similar to the assertion that flow is the process of optimal experience (Csikszentmihalyi, 1977a) "preceded by a set of antecedent conditions necessary for the experience to be achieved and followed by a set of consequences that occurs as a result of the process" (Hoffman & Novak, 1996, p. 57).

There are implications for this study for both researchers and marketers. For one thing, flow and telepresence theories are well grounded in psychology and in computer science. However, the idea of flow in online games has not been discussed in the previous research. Therefore, the finding of this study should contribute to theoretical knowledge in this field. Next, for marketers, the Internet has created a new market with new environments (Rayport & Sviokla, 1994; Rayport & Sviokla, 1995; Wieber &

Kollmann, 1998). In this new market, information is turned into a free-standing output or product in its own right. It can also increase the value and utility on top of the physical offers in the marketplace through the utilisation of the marketplace and the marketspace. Collection, systemisation, selection, combination and distribution of information will become primary activities, linked back to the virtual-actual and physical value chain in which supporting activities reside (Wieber & Kollmann, 1998). Ways to communicate with customers are not limited to traditional media any more. New interactive media has become involved. Customers are no longer only the receivers of information but senders of it as well. They are allowed to use the product by themselves, and some times with other customers.

As mentioned by (Novak *et al.,* 2000), the marketing concerned with examining these problems in the context of the Internet may be different from the perspective of classical marketing problems, such as choice and decision making, channels strategy, models of customer demand. It has unique characteristics in important ways. For example, communication between seller and buyer has significantly changed. The rich information presented to users in one-way, traditional communication channels such as radio, newspaper or TV is still important but may not be enough anymore. New characteristics, such as interactivity and response speed, have to be seriously considered as well. Therefore, the contributions of this research are perhaps best understood in these differences. "These differences imply the need to understand consumer behavior in an environment in which the rules of consumer engagement may very likely be different (Novak *et al.,* 2000)."And because of these changes, it is very important for marketers to understand customer behaviour under the new circumstances with which customers interact. For example, in order to market a new online game to the market, marketers should be aware of the factors affecting telepresence. Telepresence has to be optimised under limited Internet transmission speed. The training mode for players to practise and increase skills should be included so as not to discourage players in the initial stage. Likewise, different levels of game challenges should be provided for players who have become skilful in playing the game. A multi-playing mode should be permitted, as this is another way to allow one player to play with another player who might have the same skills. Once these conditions are met, it is possible for players to experience flow which

leads to "a sense of enjoyment that is cherished and becomes a landmark of how surfing or interaction should be" (Nel *et al.,* 1999, p. 111). Finally, the consequence of flow experience will make players feel like playing the game repeatedly (Csikszentmihalyi, 1975).

This study was conducted using minimal data as required by the Structural Equation Modeling. The model included only some key variables while some relevant variables such as speed, vividness and mapping which related to telepresence were assumed as given. The model also used minimum cross-sectional data collected over a short period of time. In general, games have different popularity throughout their product life cycle. Players also have different skills. Therefore, longitudinal data with a bigger number of subjects will help provide additional information about the proposed model.

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Appendix I

Questionnaire

Focused Attention

- My attention is focused on the computer screen.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

- When I played the game I was totally absorbed in what I was playing.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

Telepresence

- I forget about my immediate surrounding when I play the game.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

- When I play the game, I feel I am in a world created by the game I play.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

Curiosity

- Playing the game excited my curiosity.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

- I often explore the game just out of curiosity.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____ I_____I_____I

Challenge

- The game challenges me to perform to the best of my ability.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

- The game provides a good test of my ability.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

Stimulus

- The game stimulated my feeling.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

- I feel excited while playing the game.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

Skill

- I am skilful at using a keyboard/mouse/joystick to control the game.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

- I am somewhat skilful compared to my opponent in the game.

Strongly Agree **Strongly Disagree**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I

Flow

- In general, when you play the game, how frequently do you feel that time seems to stand still, nothing else seems to matter and it is an intrinsically enjoyable experience?

Very often **Never**

1 2 3 4 5 6 7

I_____I_____I_____I____I_____I_____I