

Modelling Stages of Behaviour in Social Virtual Communities

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INTRODUCTION

Once connected to the Internet, there is a myriad of virtual communities that an individual can connect to, interact within and become a member of. However, little is known about the processes individuals employ in identifying, selecting, and interacting within these virtual communities. How does an individual decide which type of virtual environment they will use? What are the stages that individuals go through in their use of virtual communities? Do the stages of use vary across types of virtual communities? In this article, we examine these questions, focusing on stages of use of individual virtual communities within the larger context of patterns of Internet use over time. First, we examine predictors of the type of virtual environments that an individual might use, highlighting the impact of demographic factors, personality, history, and location of Internet use. Then we draw on our own research to examine stages of use of two types of synchronous text-based virtual environments. Finally, we develop a generic model of stages of use of virtual environments.

INTERNET USAGE PATTERNS

An individual's interactions within one or more virtual communities exist within the pattern of their overall use of the Internet. Research has established that there are differences in Internet usage patterns by sex, age, and Internet experience (Howard, Rainie, & Jones, 2001). In addition, there may be differences in Internet use and the benefits of Internet use by personality type (Hamburger & Ben-Artzi, 2000; Kraut, Patterson, Lundmark, Kiesler, Mukophadhyay, & Scherlis, 2002; Roberts, Smith, & Pollock, 2000). However, regardless of these differences, the best predictors of the type of activities individuals engage in is the length of time they have been Internet

users and their frequency in logging on to the Internet from home (Howard et al., 2001).

Early adopters of the Internet were predominantly young, male, Caucasian, relatively affluent, well educated, and technologically oriented (Sultan, 2002). Howard et al. (2001) identified two groups of these early adopters. "Netizens" (16% of adult Internet users) log on to the Internet from home every day and engage in a range of financial and social activities over the Internet, incorporating life online into their work and home lives. In contrast, "Utilitarians" (28% of adult Internet users) adopt a functional attitude toward the Internet and spend less time online, engage in fewer activities, and have a less positive attitude toward the Internet.

Over time, the demographics of new Internet users have changed. The percentages of Internet users who are female, non-Caucasian, have lower incomes, and have lower educational attainments than early adopters of the Internet have increased (Horrigan, 2000; Katz, Rice, & Aspden, 2001), lessening, but not removing, the "digital divide." Howard et al. (2001) identified two groups of these more recent Internet users. "Experimenters" (26% of adult Internet users) typically have been online for one to three years, log onto the Internet from home every day, and engage in fun activities and information retrieval. "Newcomers" (30% of adult Internet users) have used the Internet for less than a year and typically have access from either home or work, but not both. Newcomers predominantly engage in fun activities on the Internet. These recent Internet adopters are not a homogenous group in terms of their Internet use. Horrigan (2000) distinguished between two groups of new Internet users: "Instant Acolytes" (enthusiastic new users) and "Cautious Adopters." New users' patterns of Internet use did not match that of more experienced Internet users until they began conducting transactions online, crossing the "transactions divide" (Horrigan, 2000).

The population of Internet users is not stable. In addition to the continued influx of new Internet users,

some individuals use the Internet intermittently and other users may cease using the Internet altogether (Lenhart, Horrigan, Rainie, Allen, Boyce, Madden, & O'Grady, 2003). Based on a series of population surveys, Katz et al. (2001) estimated that between 8 to 11.5% of the population have ceased using the Internet, most commonly because they had lost access as a result of changes in employment or completing education.

These typologies of Internet users provide useful insights in how different groups of people use the Internet, but do not provide information on how an individual's Internet use may change over time. A body of research is emerging that addresses this issue.

Roberts (2001) examined Internet use for 70 new Internet users over their first six months online. While hours spent online remained stable across the first six months, the time spent in specific virtual environments was subject to change. E-mail use significantly increased over time, while World Wide Web (WWW) use did not significantly differ. New Internet users explored a range of virtual environments in their first few months online before settling to use e-mail, the WWW, and typically one or two other virtual environments.

Two projects provided Internet users with computers and Internet access and tracked their Internet use over time. In the HomeNet project (Kraut, Scherlis, Mukhopadhyay, Manning, & Kiesler, 1996; Kraut et al., 1998) Internet use was characterised by strong initial use followed by fluctuations over time. Internet use declined during school vacations and increased during the school year. E-mail use was stable over time, while WWW use declined after the first few weeks online. People who used e-mail more than the WWW were more likely to continue using the Internet throughout their first year. In the HomeNetToo project (Jackson, von Eye, Barbatis, Biocca, Zhao, & Fitzgerald, 2003) the mean amount of time spent online per session increased as did the number of domains visited over a 16-month period.

Other research has employed population surveys to track changes in Internet use over time. The Pew Internet and American Life project has been conducting a tracking survey of Internet use since March 2000. This project employs telephone surveys based on asking respondents about their online activities the previous day (Horrigan, 2000). As part of this project, Fox, Rainie, Horrigan, Lenhart, Spooner, Lewis, and Carter (2001) surveyed 1,081 American Internet users who had been online for at least 6 months. The majority self-reported using the Internet for about the same amount of time (54%) or more (29%) than previously. Users who were increasing their time online were those who required the Internet for their work or education and "adventurous" users who continued to explore new activities online. Users who had decreased their time online typically had reduced their need for, or

interest in, the Internet. A further survey in this project (Horrigan & Rainie, 2002) examined Internet use of a group of users at the beginning and end of a 12-month period. Over this time, Internet use became less social and more functional, with increasing use of the Internet for work, financial, information seeking, and transaction purposes. This was reflected in increased time spent online at work and decreased time spent online at home.

Taken together, these studies suggest that there is a variety of factors that influence Internet usage patterns. These include demographics, personality, history of online use, and the location from which the Internet is accessed. In addition, an individual's pattern of use is likely to change over time.

USE OF SPECIFIC VIRTUAL ENVIRONMENTS

Within the context of overall Internet use, individuals explore a range of virtual environments. In our research we developed models of stages of use for two social text-based synchronous virtual environments, Multi-User Dimensions, Object Oriented (MOOs) and Internet Relay Chat (IRC), using Grounded Theory methodology (Glaser & Strauss, 1967). Interviews with 58 MOO users and 44 IRC users were supplemented by participant observation. Both environments offer users the opportunity to engage in synchronous computer-mediated communication. Each of these models is briefly presented below.

Stage Model of MOOing

MOOs are synchronous text-based virtual reality programs that can be accessed by geographically dispersed individuals simultaneously. Members are assigned a character that they can name, assign a gender, and describe in text. In addition, they can use object-oriented programming to create and modify objects and the virtual environment. While users can engage in a range of activities in MOOs including programming, role-play gaming, and politics, MOOs are primarily a social environment characterised by social interaction and the formation of relationships amongst members (Parks & Roberts, 1998; Ryan, 1995).

The Stage Model of MOO use (Figure 1) represents the typical stages and transitions that individuals experience from the time they first learn about the existence of MOOs until the time they either cease MOOing, or become established identities within a MOO community (Roberts, Smith, & Pollock, 1996). The basic social psychological process underlying this stage model is the individual coming to terms with what is initially perceived as an

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