Assessing the switching barriers between Microsoft Office and OpenOffice.org

by

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The undersigned hereby recommend to

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Abstract

Using a survey methodology, hypotheses derived from the open source, consumer marketing, and technical and trade literature were tested to identify the switching barriers between Microsoft Office and OpenOffice.org. 240 questionnaires were completed and analyzed. The results showed that the product-specific switching barriers are comfort with Microsoft, habituation to the Microsoft Office interface, and dependence on Microsoft Office's file formats. The user-specific switching barriers are user innovativeness, loyalty to Microsoft, and likelihood to have actively searched for information about alternatives. The key insights for stakeholders are that markets should be segmented according to user characteristics; that strategic decisions that favour the user perspective may need to be made to improve OpenOffice.org adoption; that a progressive introduction of OpenOffice.org will likely improve adoption; that users do not care about most of the factors listed in the literature; and, that the theoretical foundations in the open source literature have a developer bias.

Acknowledgement

Finally, my thanks to Sarah Gelbard, for the motivation to take on this work, for giving me the will to take on ever-greater challenges in life, and for the support that guides me through them.

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1 Introduction

The open source literature has examined the concerns of various stakeholders of an open source software ecosystem. Researchers have examined motivations of individuals and organizations to contribute code to open source projects (Bonaccorsi & Rossi, 2006), the process of distributed software development in an open source community (Henkel, 2003), how an open source community is built and supported (Dutta & Prasad, 2004), and how to extract value from an open source ecosystem (Dahlander, 2004). The open source literature has focused mostly on enterprise class software, and has not considered desktop software such as office suites, or the behaviours and motivations of users of desktop software. This thesis expands on the open source literature by addressing consumer class software, specifically office suites and their users.

The consumer marketing literature is rich with studies on reasons consumers switch service organizations, retailers, or products (Keaveney, 1995; Colgate & Hedge, 2001; Zeithaml, Berry, & Parasuraman, 1996). The literature has not examined why consumers switch software products. Further, it has not examined why consumers do not switch software products when presented with compelling alternatives. This thesis fills gaps in both the open source and the consumer marketing literature by assessing why consumers do not switch office suites.

The consumer marketing literature has examined consumer behaviour and how various factors impact consumer purchasing behaviour in a broad variety of situations (del Río, et

al., 2001; Hirunyawipada & Paswan, 2006; Lin & Chen, 2006; Wakefield & Blodgett, 1999). Most of the focus has been on the personal characteristics and behavioural factors of consumers that lead to an increased likelihood to purchase a product or service. This thesis contributes to the consumer marketing literature by examining which consumer characteristics and behavioural factors increase the likelihood that users consider switching office suites.

The technical and trade literature is filled with reasons why consumers might choose one office suite or another. Every author has expressed his personal opinion on the subject. There is a heavy technical focus in these reports, digging deep into the internals of the products. Most users are not aware the minute details, and are concerned with things that more directly relate to the efficiency of their daily tasks.

This research surveys users of Microsoft Office, which includes software components that are commonly used in homes and offices around the world such as Word, Excel, and Powerpoint. It measures the effect and relevance of potential reasons for not switching to the open source alternative, OpenOffice.org, which offers comparable features and functionality, and is available for free. This research further assesses and evaluates the characteristics and behaviours of users who report having considered switching office suites. These users make an interesting sample because of their broad demographic diversity, background, education, varying technical skill, and interests. These users are readily available to survey, as use of Microsoft Office is widespread.

This thesis is organized as follows. The first chapter defines the research questions, deliverables, relevance, and contributions. The second chapter reviews the literature on open source and consumer marketing, and the technical and literature on office suites. The third chapter describes the research method used for this research. The fourth chapter describes the results of the survey. The fifth chapter discusses the results. The thesis concludes in the sixth chapter with the generation of insights for the stakeholders of the research, a discussion of the conclusions drawn by the researcher, a discussion of the limitations of the research, and suggestions for future research.

1.1   Objective

The objective of this thesis is to test hypotheses about the switching barriers between Microsoft Office and OpenOffice.org, and the characteristics and behaviours of users that relate to their likelihood to have seriously considered switching office suites.

1.2   Deliverables

The deliverables of this thesis are the results of the hypotheses testing of the switching barriers between Microsoft Office and OpenOffice.org, and the results of hypothesis testing of the characteristics and behaviours of users that relate to their likelihood to have seriously considered switching office suites.

1.3   Relevance

This research is relevant to three groups; top management teams, the IT professional

community, and academia. Top management teams, especially those in companies that participate in open source ecosystems, will be interested in the results to better understand the challenges they face in getting users to accept open source alternatives to proprietary software. The results of this research identify potential misunderstandings in the minds of their users about the nature of open source software, and highlights the challenges that need to be overcome to improve switching behaviour of users. Mainstream corporate interest in open source software is high, with IBM, Apple, Oracle, Corel, Intel, Ericsson, and many other Fortune 500 companies contributing to initiatives that support growth and research in open source software (Feller & Fitzgerald, 2000).

The IT professional community is particularly interested in this research as it provides an empirically tested answers to longstanding questions about the perspective of mainstream users when it comes to open source software. The IT professional community has been engaged in a debate on the topics addressed by this thesis for well over a decade. The divide between the technical skills, business skills, marketing skills, and characteristics and behaviours of the IT professional community and mainstream users has lead to a widening rift of misunderstanding. The IT professional community, especially its more active members, will be very interested in the outcomes of this research to assist in developing better plans for the mainstream adoption of open source software. The findings will also help quell the fires of the more heated debates that in the past have more often than not been fuelled exclusively by personal opinion, and anecdotal evidence, rather than properly controlled studies (Slashdot, 2008).

Academia will be interested in this research as it is the first empirical assessment of the switching barriers between Microsoft Office and OpenOffice.org. Academics in the area of open source research will be interested in the switching barriers that relate to the differences between proprietary and open source software. The outcomes of this research will help improve the current theoretical models of participation in open source ecosystems. Academics in the area of consumer marketing research will be interested in the characteristics and behaviours of users who seriously consider switching office suites, but do not, and the reasons why they do not switch despite the appearance of a compelling alternative. They will also be interested in the test of traditional consumer marketing measures with software instead of more traditional consumer goods.

1.4   Contribution

This research makes at least four contributions. First, it contributes to the open source literature by examining the switching barriers between Microsoft Office and OpenOffice.org, which had not previously been empirically examined in the literature.

Second, the results of this research identify the gaps in the current understanding of the switching motivations of users of desktop software, enabling stakeholders in open source ecosystems, such as the companies who release open source software alternatives to commercial off-the-shelf (COTS) software, to address these shortcomings. Addressing these issues will likely improve the adoption rate of their software, and may enable them to create more value for themselves and the ecosystem in which they participate.

Third, the outcomes of this research will help bridge the gap of understanding between the IT professional community and the average user of desktop software by putting to rest longstanding debates on user motivations that were previously based on opinion, and anecdotal evidence, instead of well researched data. By better understanding the motivations and behaviours of users, IT professionals will be able to better service user needs, leading to increased satisfaction in IT services.

Fourth, this research contributes to the consumer marketing literature pool by answering the calls by numerous authors to conduct studies on how consumer characteristics and behaviours moderate product and service choice decisions. It will improve the understanding of the impact of user characteristics and behaviours, including ethical considerations, social class, innovativeness, loyalty, cultural identification, product involvement, dissatisfaction, and tendency to search for information about alternative products, and how these factors affect the likelihood to consider switching products or services.

2 Literature review

This chapter reviews the literature related to this research. It is organized into four sections. The first sections reviews the open source literature. The second section reviews the technical and trade literature on the switching barriers and switching motivators between Microsoft Office and OpenOffice.org. The third section reviews the consumer marketing research literature. The fourth section summarizes the lessons learned from the literature review.

2.1 Review of open source literature

This section reviews the current literature on open source. The motivations of companies to participate in open source software development are reviewed first. The motivations of individuals to participate in open source software development are reviewed second. The motivations of users to use open source products are reviewed third. The section concludes with a review of common concerns surrounding the adoption of open source software.

2.1.1 Motivations of companies to participate in open source software development

There are many reasons companies choose to release code as open source. Many researchers have investigated the issue. At first glance, it would appear foolhardy to not keep one's intellectual property proprietary. By looking below the surface, academics have shown that releasing code as open source can be key to a successful business

strategy and is an important move that many businesses seeking to improve adoption of their products.

One of the major reasons to release code as open source is to hasten the adoption of a software product. By giving away the product for free, it becomes much more accessible to the public. When the product is a platform that can be used to build complementary or related products, releasing it as open source can promote its standardization as a dominant design (Dahlander, 2004).

Open sourcing can be a key strategy to commoditize a competitor's offering, and clearly differentiate a company from its competition. Giving away a product that is comparable to a competitor's closed-source, paid-for offering can greatly devalue the competition's product. It signals to the public that they do not necessarily have to pay for that class of product. Customers may then perceive the value as not being in the product itself, but in other products and services the open source companies can provide. (Henkel, 2003; Hohensohn & Hang, 2003).

A now well known method of generating returns from open source is to give away the product, and sell complementary services, such as support, maintenance, training, or updates. The open source product is treated as a loss-leader, and allows a company to focus on generating returns from higher margin services (Hohensohn & Hang, 2003).

Open sourcing a product can also help better meet customer requirements, which can lead

to better customer retention and satisfaction. Many customers like the ability to modify the software they use, in the event that they have need for a unique feature that the developing company is not likely to develop (Hohensohn & Hang, 2003).

Releasing code as open source increases the value of complementary products. For example, IBM may profit from developing and releasing improvements to the GNU/Linux operating system if these improvements make it function better with IBM's hardware, making it more appealing and increasing sales (von Hippel & von Krogh, 2003).

Companies benefit from participation in open source by acquiring sources of innovation that would otherwise be inaccessible to them. The best talent in software development is distributed in companies around the world. By participating in open source development, companies can integrate the work of top minds into their software projects and add value to their company's offerings without having to develop all the innovations in house (Goldman & Gabriel, 2004).

Finally, by open sourcing a product, a company creates goodwill and earns respect from its customers. It gains popularity and establishes a good reputation with its user base. This goodwill can lead to increased referrals, more customer confidence, and increased business with customers. It also increases the value of the company's brand, as it can increase customer loyalty and trust in the company (Andersson, Hässler, & Nedstam, 2005).

2.1.2 *Motivations of individuals to participate in open source software development*

Individual developers contribute to open source projects by adding features, fixing bugs and organizing the development process. There are several reasons why they are willing to provide their time and effort at no cost to participate in an open source project.

Many developers feel part of a unique culture and community. They work on an open source project to foster a sense of belonging in the community. They enjoy the companionship and discussions with their peers, and are proud of the work they contribute (Bonaccorsi & Rossi, 2006).

Developers also contribute to an open source project as a means of getting support from the community for the aspects of the project that they are interested in, and use most often. By contributing to the product, they feel more comfortable asking for help from other developers, and are more likely to receive it. The support that they receive from the open source community can be much cheaper, and of higher quality expertise than paid support services (Henkel, 2003).

Finally, developing for an open source project gives programmers a venue to showcase their talent to the world. It permits her to show the quality of her work, and build a portfolio of accomplishments. This work builds a reputation for the developer and serves as a signaling mechanism that may lead to contracting or full time work. Many companies actively headhunt their development talent from the pool of developers in open source projects. The work done on the project, and the way the developer interacts

with the community serve as a key assessment of the candidate's potential value to the company (Lerner & Tirole, 2001).

2.1.3 *Motivations of users to use open source software*

There are several reasons why users choose to use open source products over proprietary ones. The primary reason is to satisfy their own needs. The user needs to get a job done and the open source product can help. This sort of end-user is the most common type of user of open source products (Bonaccorsi & Rossi, 2006). Open source products are marketed via a broad range of media, including magazines and newspapers, so end-users are becoming more aware of competing options to commercial off-the-shelf (COTS) software.

Another primary reason users choose open source products is to save money. For nearly every type of proprietary software to perform common tasks on a computer there is an open source alternative available for free. In many cases, users are willing to trade off the warranty and support services offered by proprietary companies for the inexpensive use of an open source alternative (Koenig, 2004).

Some users choose open source software to support a sense of belonging to a community and to support a social and political movement. They subscribe to a set of ideals that state that software should be a public good that the worldwide community should be able to benefit from without restrictions (Stallman, 1985).

Lastly, many users are motivated to choose open source products to avoid vendor lock-in. When selecting a product that will be used as a platform to be built upon, or that will handle data in a proprietary fashion, many users are concerned about what will happen to their data or add-ons should the company that sold them the product go out of business, or stop supporting the product that was purchased. Open source products are a compelling alternative that have community support, and allow users to get at the internals of the product should they ever need to support or maintain the product on their own. Over the life of a product's use, this ability to get at the code drastically reduces the risk of purchasing a product (Kollock, 1999).

2.1.4   Concerns surrounding open source software adoption

The adoption of open source software has been troublesome. As with any new type of product, would-be users have their share of concerns. Many of the concerns are unfounded, but they are nonetheless a problem that companies that participate in open source software development must contend with.

The first commonly expressed concern about open source products is that revealing the source will lead to an insecure product. Many users are worried that by making the code available, "hackers" will be able to find vulnerabilities in the product and create exploits to take advantage of them. They falsely believe that proprietary products are more secure and are less vulnerable to attack or exploit (Lawton, 2002).

Whenever a company gives away something for free, there is always a concern about the

company's motives in doing so. Anti-corporate sentiment has lead people to distrust companies, and some people get concerned that the open sourcing of a product is an attempt to misdirect the public with a good deed that is in fact nefarious at the core. Many users wonder if companies have an ulterior motive for open sourcing a product that will take advantage of the user in the end. A company releasing code as open source must be careful to build trust in the community (DiBona, Cooper, & Stone, 2006; Hohensohn & Hang, 2003).

Finally, some users are concerned that because it is developed by a multitude of users, many of whom are programmers, that an open source product will be harder to use. In some cases, such as with user interfaces, many programmers have had trouble understanding how end-users would naturally use a product, which may result in a sub-optimal design. As such, some people will assume that an open source product is free because it is not good enough for mainstream use, and is only for an elite group of knowledgeable programmers (Nichols & Twidale, 2002).

2.1.5   Adoption of OpenOffice.org

Researchers have examined the adoption of OpenOffice.org in various environments. The focus has traditionally been on adoption of OpenOffice.org in corporate environments. Huysmans, Ven, and Verelst (2008) did a case study on the Belgian Federal Public Service Economy, which had considered switching to OpenOffice.org, but eventually decided not to switch. They found that there were various aspects that were in

favour of the adoption of OpenOffice.org by the organization, and that user attitude was positive. They found that training options were present, that support was available, and that all of the functionality required by regular users was available in OpenOffice.org. However, these factors were not sufficient to lead to management approval to switch office suites. The case study revealed numerous switching barriers, including compatibility with development platforms, integration with third party software, the organization's change management process, and network effects. The data-intensive nature of the organization was also found to be a significant technological barrier, as many of the users had functional requirements that significantly exceeded those of mainstream users in order to perform data processing tasks. Overall, the study provided insights into the difficulties in adopting OpenOffice.org in corporate environments.

Rossi, Sillitti, Scotto, and Succi (2005) conducted an empirical investigation in a public administration environment on the challenges faced by transition to OpenOffice.org. They evaluated the placement of OpenOffice.org side by side with Microsoft Office with a gradual and measured approach that included techniques to ease the diffusion of OpenOffice.org, like automatic association with the Microsoft Office file extensions. They found that there were no measurable negative effects on user productivity due to the transition. They also found that users had different attitudes towards OpenOffice.org before and after introduction and usage. Nearly all the users felt that OpenOffice.org would be a suitable substitute office suites to meet their needs, with little or no problem. The study found no interoperability issues in terms of particular constraints with other software used in the environment. The results suggest that a metered progressive

approach to the introduction of OpenOffice.org may be a good way to increase its

adoption rate.

2.2 Review of technical and trade literature

This section reviews the technical and trade literature. The switching barriers between

Microsoft Office and OpenOffice.org are reviewed first. The motivations to switch from

Microsoft office to OpenOffice.org are reviewed second.

2.2.1 Switching barriers between Microsoft Office and OpenOffice.org

The consumer press, technical review websites, and subject matter experts have reported

on switching barriers between Microsoft Office and OpenOffice.org. Stafford (2006)

describes the comparison of the two application suites a "David-Goliath match up", and

cites fewer capabilities, compatibility issues between Microsoft Office and

OpenOffice.org file types, compatibility issues between OpenOffice.org and third party

applications, user resistance to change, user preconceptions, and bias against non-

Microsoft companies as the major switching barriers.

Miller (2006) compared OpenOffice.org and Microsoft Office and reported that the major

switching barriers between them were lack of training options for OpenOffice.org, the

exclusivist culture of developers and users of OpenOffice.org, user resistance to change,

user habits, and the slower performance of OpenOffice.org in some tasks. She suggests

that the largest barrier is the lack of training that focuses specifically on non-technical

users and calls on the open source community to offer courses that teach non-technical users in a way that they can understand, to give them the confidence in OpenOffice.org that they developed over many years of getting used to Microsoft Office.

McMillan (2006) examined the current research on the security of OpenOffice.org and concluded that the basic design of the software is flawed, resulting in inadequate security checks. He suggests that the increased flexibility of OpenOffice.org increases the number of vectors of attack for writers of malicious code. He cautions that users may wish to avoid switching from Microsoft Office to OpenOffice.org as Microsoft has written their code in such a way that it precludes many of the vulnerabilities found in OpenOffice.org. He suggests that Microsoft is more careful with security principles that he claims the OpenOffice.org development team ignored.

Matzan (2005) compared Microsoft Word and OpenOffice.org Writer, the two most popular applications of their respective office suites. He cites poor macro compatibility between OpenOffice.org Writer and Microsoft Office Word , a less powerful dictionary in Writer, lack of a grammar check feature in Writer, and different means of accessing comparable features in the two programs as the primary switching barriers for users.

Scoble (2006) argued that there are many switching barriers between Microsoft Office and OpenOffice.org. First, he argues that the licensing fees for Microsoft Office are often overstated, and are not nearly as bad as many sources report; student versions are available at around $100, and bundled versions for $250. Discounted versions are also

available for upgrades. He argues that this fee is not prohibitive, and the comfort of staying with Microsoft Office is sufficient to keep users from switching. He further argues that, despite contrary reports, Microsoft Office has performance advantages, better flexibility, and more features than OpenOffice.org. He suggests that the productivity gains of sticking with Microsoft Office outweigh the reduced cost of switching to OpenOffice.org. He sums up the barriers by making the case for users who depend on customized forms, templates, and add-ons tailored specifically to their needs, arguing that switching from Microsoft Office to OpenOffice.org would require recreating all their forms, templates, and add-ons from scratch, which would be prohibitively expensive and time consuming.

Ridling (2007) highlights several reasons why users may not switch from Microsoft Office to OpenOffice.org. OpenOffice.org has a slower startup speed due to the fact that it uses the JAVA Runtime Environment (JRE) instead of DLL files, like Microsoft Office; the whole suite must be installed to use the individual components such as word processor or spreadsheet manager; some of the features in OpenOffice.org are not as advanced as their equivalents in Microsoft Office; and, when upgrading to newer versions of OpenOffice.org, users must download the entire installer program anew – it is a very large download, and smaller sized patches are not available to upgrade to newer versions.

Dolinar (2008) explored the question of why more people do not use OpenOffice.org. He suggests the primary reason is artificial barriers intentionally crafted by Microsoft to prevent people from switching from Microsoft Office to OpenOffice.org. He describes

these artificial barriers as "digital walls" erected "to keep other vendors out and users in".

His primary example is Microsoft's proprietary data formats. He argues that users don't

switch to OpenOffice.org from Microsoft Office, despite the cost incentives, because they

are locked in to closed standards.

In its strategic marketing plan, OpenOffice.org (2008b) detailed numerous switching

barriers between Microsoft Office and OpenOffice.org. The primary switching barrier is

that most users are "quite comfortable" with their current office suite. The plan suggests

that users will not consider switching office suites until "trigger points" occur, such as the

acquisition of a new computer; the need for additional functionality; the need to get rid of

unlicensed commercial software; and, forced upgrades due to end-of-life of their current

product. The plan suggests that outside of these trigger points, the switching barrier of

user indifference is too high to surmount. The plan also details the weaknesses of

OpenOffice.org, which may act as deterrents to users considering switching from

Microsoft Office. As potential switching barriers, it cites user concerns about Sun

Microsystem's patronage of the project; immature community; lack of self-generated

finances for the project's development; concerns about the chosen open source license;

the size of the code base; the lack of built-in integration with other software; the lack of

macro compatibility with Microsoft Office; the need for the Java Runtime Environment

on systems using OpenOffice.org; cross-platform nature of program makes platform

specific optimization difficult; installer is difficult to use; lack of end user extras such as

hard-copy manuals, templates, and clip art; lack of OEM pre-installation for new

computers; lack of official local support structure; lack of user awareness about

availability of OpenOffice.org for their platform; and, large footprint of the program.

2.2.2 Motivations to switch from Microsoft Office to OpenOffice.org

Many authors have examined the motivations to switch from Microsoft Office to OpenOffice.org. Haugland (2008) reports that users are motivated to switch by novel features in OpenOffice.org, such as its built-in PDF converter; by social pressures from friends and colleagues who are open-source or anti-Microsoft advocates; by the fact that OpenOffice.org is available for free; by reasons of principle in supporting the open source movement; and, by the fact that the complexity and frustration of switching to OpenOffice.org is comparable to the complexity and frustration of upgrading to a newer version of Microsoft Office, such as from version 2003 to version 2007. He suggests of the latter that users are going to have to deal with compatibility problems when upgrading versions of Microsoft Office, and as such might as well "take the plunge" and switch directly to OpenOffice.org and avoid the expense associated with Microsoft Office.

In his comprehensive review of word processors, Ridling (2007) summarizes the reasons to switch to OpenOffice.org as: open file format; broad language support; largest document capacity and smaller document size; great multi-platform support, including Windows, Linux, Solaris, Google Docs, and many others; ability to customize for institution-specific academic standards; support for exporting to PDF and LaTeX formats; feature-rich bibliography database; alternative viewing modes; better customizability; better document recovery; more customizable user interface; liberal licensing with lack of

vendor lock-in; lack of harassing anti-piracy measures; free license; and, easy to learn and use.

Gralla (2008) compared Microsoft Office and OpenOffice.org and found that given OpenOffice.org can "do just about anything Microsoft Office can do, supports a wide variety of formats, and is free" users have little motivation to continue using Microsoft Office. Vaughan-Nichols (2008) built on Gralla's review, suggesting that, due to Microsoft Office's poor format support, expensive price tag, radical change in user interface, users are moving to OpenOffice.org instead of upgrading to the latest version of Microsoft Office.

Schulz (2008) argues that the primary motivation to switch from Microsoft Office to OpenOffice.org is the lack of open standards and the failure of Microsoft Office to embrace the way the paradigm of office suites has evolved. In his view, the new paradigm of office suites must involve the "creation of open content through the use of open and free formats, ideally standards", the "freedom to share and distribute this content", and "ease of use and simplicity". He suggests that users that continue to follow the "deprecated mentality" of Microsoft Office will be left behind as new ways to create and share data continue to evolve. He echoes several tenets of the open source movement as motivators to switch from Microsoft Office to OpenOffice.org: freedom to use, freedom to share, freedom to modify, and freedom to distribute.

Ciurana (2004) found that the deployment and testing time and costs for the installation

of OpenOffice.org in most large corporations is lower than for Microsoft Office. He

further argued that migration costs in terms of user support and retraining are comparable

to upgrades between versions of Microsoft Office. He enumerates the motivations to

switch from Microsoft Office to OpenOffice.org as backwards compatibility, better

security, easier information exchange, standardized formats, more support options, better

feature set, better interoperability, better flexibility, and lower cost.

Farnum (2006) responded to McMillan's (2006) criticisms of the security of

OpenOffice.org by arguing that users have an incentive to switch to OpenOffice.org from

Microsoft Office due to the fact that fewer malicious programmers, who create worms

and viruses, are directly targeting OpenOffice.org.

Numerous writers and associations have echoed the call for switching to OpenOffice.org

from Microsoft Office to support non-proprietary formats, such as the OpenDocument

Format (ODF). The OpenDocument Format Alliance (2007) argues that "as documents

and services are increasingly transformed from paper to electronic form, there is a

growing problem that governments and their constituents may not be able to access,

retrieve and use critical records, information and documents in the future." They suggest

a switch to the OpenDocument Format to enable greater control over and direct

management of one's own records, information and documents. The European

Commission's Directorate General for Informatics (IDABC) began promoting the

OpenDocument Format, the default format supported by OpenOffice.org, in 2006.

NATO (2007) soon followed suit, including the OpenDocument Format, in its

Interoperability Standards and Profiles. Deckmyn (2006) reports that the Belgian government has standardized on the OpenDocument format, and may be moving away from Microsoft Office in favour of OpenOffice.org as early as September 2008, as soon as they analyze the potential impact of the software's deployment. Belgium is the first country to standardize around the OpenDocument Format, with France and Denmark considering the option as well.

Another commonly reported reason for switching from Microsoft Office to OpenOffice.org is to avoid the legal ramifications associated with pirated software. Microsoft (2006) reported that it estimates as much as 35% of all PC software used worldwide is counterfeit, or otherwise illegal. The company extols the negative impact of software piracy and warns consumers of the potential legal consequences. Through the Business Software Alliance, a group funded primarily by Microsoft, it began setting up means of prosecuting offenders. It now uses the Internet to put piracy detection software into copies of Microsoft Office. The company even admitted that its customers find software licensing too complex and could easily break the rules by mistake. OpenOffice.org (2008c) responded to this offensive with a campaign to promote OpenOffice.org as "a completely legal and free alternative" to Microsoft Office. They argue that users can get "peace of mind at no cost". They began promoting the slogan "Get legal – get OpenOffice.org today!" to emphasize the point. Beer (2006) wrote that this tactic was quite effective, and that when faced with an inundation of unwanted alerts in Microsoft Office, most users are likely to defect to OpenOffice.org. A poll conducted by iTWire revealed that as many as 86% of respondents said they would rather try

OpenOffice.org instead of buying Microsoft Office 2003.

Unsurprisingly, OpenOffice.org (2008d) offers the most comprehensive of reasons to switch from Microsoft Office to OpenOffice.org. They categorize the switching motivations into reasons for governments, education, businesses, not-for-profits, IT businesses, and free/open source software (F/OSS) advocates. For governments, the listed reasons are best value, due to the fact the program is not owned by a commercial organization; there are no license fees to pay, no expensive audits and worries about non-compliance with onerous and obscure licensing conditions; ability to freely distribute the software through any means; perpetual accessibility to the data with ISO approved file formats; availability of localization for minority languages; and, the ability to inspect the code. For education, the listed reasons are good teaching platform for literacy and development skills without tying students to commercial products; good platform for creating teaching materials and managing administrative tasks; high quality software due to peer-reviewed process; and, availability to all, regardless of income. For businesses, the listed reasons are cost and hassle reduction for deployment; no requirement to recreate information; easy transition to ISO standardized format; compatibility and better features; access to add-ons as needed; no worries about compliance and audits; and, availability of commercial support. For not-for-profits, the listed reasons are access to high quality standard at no cost; compatibility; access to localizations; avoidance of license compliance issues; and better features. For IT businesses, the listed reasons are unbeatable value proposition; ability to offer better value to customers; ease of integration with other software; availability of development toolkits; compatibility;

avoidance of licensing concerns; broad means of distribution; and no licensing fees. For F/OSS advocates, the listed reasons are availability of localizations; means of creating additional localizations; means through which to eradicate digital exclusion of minority languages; ease of writing extensions and using as a component in other applications; and, the ability to bring together experts in a broad variety of fields, such as developers, translators, artists, technical authors, testers, people offering user support, sales and marketing people, lobbyists, and donors, internationally, to build and support a community to ensure that the needs of future users are perpetually met. OpenOffice.org sums up the benefits to all users in three points: the product is the result of high-quality engineering and supports all the features needed in office software; it is easy to use as it is localized and compatible with other office suites; and, it is free of restrictive licenses and usable and distributable, for any purpose, at no cost.

In its strategic marketing plan, OpenOffice.org (2008b) outlines numerous motivations for users to switch from Microsoft Office to OpenOffice.org. The plan follows Christensen's (2003) model for disruptive innovations, and argues that overserved users have a strong motivation to switch. Many overserved users who are considering upgrading their current version of Microsoft Office do not use all the features of the current version, let alone the features that will be included in the upgraded version. The plan argues that OpenOffice.org offers a fully-featured office suite at little or no cost, and that this is the largest motivation to switch. It exhaustively lists the distinctive features of OpenOffice.org and the benefits that they offer to users, motivating them to switch. The list includes no license fees; no compliance concerns; ability to inspect source code;

ability to share program freely; open APIs; easy to learn; easy to migrate; compatibility with Microsoft Office file formats; similar look and feel to Microsoft Office; additional features for PDF file creation; use of open document standards to ensure perpetual access and lack of vendor lock-in; more stable product; cross platform availability; extensive localization; community support; lack of monopolistic oversight; and, advanced user features. The plan suggests that while many of these benefits target mainstream users, the primary market will be overserved users who are content with the basics, and will embrace the lower cost.

2.3   Review of consumer marketing research literature

This section reviews the consumer marketing literature. First, the switching barriers identified in the literature are reviewed. Second, the product-specific factors that affect purchasing or switching behaviour are reviewed. Third, the consumer-specific factors that affect purchasing or switching behaviour are reviewed. Fourth, the ethical factors that affect purchasing or switching behaviour are reviewed. Fifth, the circumstantial factors that affect purchasing or switching behaviour are reviewed.

2.3.1   Switching barriers

Colgate and Lang (2001) conducted an extensive review of the switching barriers of products and services in a broad range of industries. They found four major categories of consumer switching barriers. The first category is relationship investment. Relationship investment is the benefit that consumers get from committing themselves to establishing,

developing and maintaining a relationship with a company. This benefit may be social, in the form of special treatment, or confidence based. Consumers that have made a relationship investment may remain in a relationship with a company, even if they perceive the core attributes of the product or service as being less than optimal if they feel they are receiving relational benefits. The second category is switching costs. Switching costs are the costs of changing products in terms of time, monetary, and psychological costs. These costs create a dependence of the consumer on the company that offers the product. Even dissatisfied customers may avoid moving to a new product because the switch requires investing effort, time and money. Switching costs also relate to a consumer's perception of the uncertainty and adverse consequences of switching to another product. This perceived risk represents a consumer's uncertainty about the outcome of switching products in terms of financial, performance, social, psychological, safety and time/convenience loss. It is a conceptualization of the likelihood of negative consequences, and may have little to no relation to the actual switching costs. The third category is the availability and attractiveness of alternatives. The number of alternative products, as perceived by the consumer, influences their decision to switch. There may not be any alternatives, or the consumer may perceive that there are no alternatives, or perceive that there are no differences between alternatives. This perception, whether accurate or not, may make it appear to the consumer that switching from one product to another is not worthwhile. Further, even if a consumer is not satisfied with their current product, they may perceive that alternatives are even worse, and this perception may impact their likelihood to switch. The fourth category is service recovery. Service

recovery includes all the activities and efforts of a company to rectify any dissatisfaction a consumer may have with their experiences with the product or company. Consumers may stay with a particular product even after experiencing problems because they are content with how the problem was resolved after they complained. Good service recovery can change a customer's mind about switching to a different product, and can even lead to the customer being more satisfied with their current product than before the problem was encountered.

Following their review, Colgate and Lang (2001) empirically examined why customers do not switch service organizations, even though they have seriously considered doing so. They found that four major factors are responsible, amalgamating some of the factors that were previously separated in the literature, and separating some that were previously considered as single factors in the literature. The most significant factor was termed "apathy", and consisted of the fact that the 'status quo' was more appealing than available alternatives. Consumers found that switching was "too much bother in terms of time and effort" and unlikely to yield worthwhile benefits. The second most significant factor was termed "negativity", and consisted of all the negative reasons customers might not switch, including being locked in to a particular provider, being concerned about negative consequences, and uncertainty about the outcome of switching to another provider. The third most significant factor was termed "relationship investment", and consisted of loyalty, interaction with provider, preferential treatment, and the fact that customers are not willing to switch because they have developed a relationship between themselves and the company offering the product or service they use. The fourth most significant factor

was termed "service recovery", and consisted of the satisfactory handling of a customer complaint. Consumers did not switch when a complaint or problem was resolved to their satisfaction. In their prioritization of the four factors that inhibit customers switching providers, Colgate and Lang found that the first two factors, "apathy" and "negativity", were considerably more significant than the latter two factors, "relationship investment" and "service recovery". They suggested that the first two factors were so much more significant, in fact, so as to almost consider the latter two unimportant in customer switching decisions. They conclude by noting that the number of consumers who seriously consider switching products or services, but remain with their current provider is as high as 22% on an annual basis, and hence merits more research. They specifically issue a call for research in switching barriers across additional industries to contribute to the advancement of consumer marketing theory.

2.3.2 Product-specific factors

del Río, Vázquez and Ingelsias (2001) examined the effect of brand associations on consumer response. Their research examined the dimensions of brand image, and assessed the value of the brand as perceived by consumers. In an empirical examination of the Spanish sports shoe market, the researchers found that four functions of a brand, namely guarantee, personal identification, social identification, and social status affect consumer response in terms of the consumer's likelihood to recommend the brand, pay a price premium for it, and accept brand extensions. Companies that carefully manage their brand to optimize the effect of the functions identified will be able to gain a

competitive advantage. This advantage manifests itself in three forms, in terms of the ability to elicit inelastic consumer responses to price increases; increased brand loyalty and reduced vulnerability to competitive marketing actions; and, increased growth potential through word-of-mouth referrals and brand extensions.

Ang, et al. (2004) researched the emergence of animosity towards economic giants as a factor in consumer purchasing behaviour. Their research suggested that in times of economic crisis, consumers become more patriotic towards the purchase of local products. Foreign products are shunned by recession-hit economies. They pointed out that it is essential that foreign products be adapted and localized to the needs of consumers in different countries, with different economic profiles. By establishing a presence in the local economy, investing in the country, employing local workers, and adapting branding to avoid taboos, companies can reduce feelings of animosity towards foreign products and increase consumer adoption of the products. Managing these factors gives local consumers a feeling of control over their economy, and fosters good will, which can improve trade relations and reduce trade barriers.

Wulf, Odekerken-Schröder, Goedertier, & Van Ossel (2005) considered consumer perceptions of store brands versus national brands. They considered brands with varied positioning against a national brand in terms of perceived brand equity, and evaluated whether brand loyalty towards a particular brand and store patronage affected consumer evaluations. They found that national brands have stronger brand equity. When consumers are aware of the brand, they hold strong and favourable brand associations in

memory. This result was shown by the fact that when consumers were not aware of the brands, they evaluated the quality of the products in favour of the store brands. They also found this effect to be present when store brands were compared to one another, without the presence of the national brand. Consumers exhibited loyalty to a particular store and ranked that store's brand higher, much in the same way they favoured the national brand when they were aware of the brands. Their findings support that private labels can offer the same or better quality than national brands, at a lower price, but that the visibility of brand may affect the consumer's perceptions of brand equity, to the detriment of the less visible brands.

Kwon, Lee, & Kwon (2008) evaluated the effect of perceived product characteristics, such as involvement, product type, and switching cost, on private brand purchases. Using a survey, they measured product characteristic perceptions for six product categories and compared them to private brand purchase intent. The analysis of the results showed that perceived product characteristics have a significant effect on purchase intention of private brands. Consumers are more likely to buy private brands in product categories where involvement and perceived switching costs are low. Consumers are also more likely to buy private brands of products that have search properties, that is to say that their salient characteristics can be evaluated prior to purchase and do not need to be experienced first to determine if they meet the consumer's perceived need. The outcomes of this research have implications for the positioning of private brand products that may or may not be of types that facilitate consumer adoption, especially in the face of competition from national or otherwise more visible brands. The authors advocate that

future research should examine broader product categories, more product characteristics, and a broader cross-section of consumers to increase the generalizability of the results.

2.3.3 Consumer-specific factors

Riquelme (2001) examined how well consumers understand their own purchasing behaviour. He empirically evaluated how much knowledge consumers have about a purchase and compared that knowledge to their ratings of the importance of attributes related to the article to be purchased. The results of the study suggested that consumers have a relatively good predictive power when it comes to their purchases, but that the knowledge was not perfect. When consumers are asked about a product that they are familiar with, and have direct experiences with, they can predict their purchasing behaviour relatively well. However, when a consumer has limited knowledge about a product, they are more likely to be less aware of the attributes they use in decision making, and more susceptible to cognitive dissonance. This different behaviour is most evident in the variance between self-reports and actual purchasing behaviour.

Williams (2002) examined the influences of social class on the evaluation criteria of consumer purchases. He assessed the importance of utilitarian and subjective evaluation decision criteria on a variety of products that had varying social significance associated with them and compared the results across social class, income and gender. The study found that social class is a significant predictor of evaluative criterion importance for many products and that women generally attached more importance to nearly all

evaluative criteria, and exhibited different relative importance levels for criteria across social class and income levels, with the notable exception of low price, where men rated this factor much higher than women. Relative income levels were found to be more predictive than income or social class alone. The objectivity of the social sensitivity of the product in question also affected consumer behaviour, with utilitarian criteria getting higher importance ratings for socially non-significant products, and, in general, was negatively associated with income. The results suggested that the social significance of a product drastically change how consumers set and measure the evaluation criteria for their purchasing behaviour. Williams issued a call for the study of more product-specific criteria for more narrowly defined products instead of broad product categories to improve the understanding of the effects of social class factors on buying behaviour.

Kim, Forsythe, Gu, and Moon (2002) examined the relationship of consumer values, needs and purchase behaviour across cultures. They focused on the personal values that drove consumer attitudes and consumption behaviour, and compared the results between participants in China and in South Korea to examine the individual contributions of social affiliation values and self-directed values. The study showed that actualization patterns in the satisfaction of experiential, social and functional needs through brand loyal behaviour differed between samples, even though the needs were influenced by the same self-directed values. They concluded that different needs were fulfilled through the purchasing behaviour examined, and that while Asian countries are considered to be more collectivistic, or relationship focused societies, the relationship or social affiliation values do not affect consumers' purchase motivations. Rather, consumers in each country have

different needs, and the presentation of means to address those needs should be tailored to each target market to improve the success of marketing strategies. The research highlights implications for the marketing of products across social barriers.

Orth, McDaniel, Shellhammer, and Lopetcharat (2004) examined the role of consumer psychographics and lifestyle in how consumers react to marketing communications that empathize different brand benefits. Their study identified five dimensions of utility to which customers react, namely functional, value for money, social, and positive and negative emotional benefits. They compared these dimensions against consumer brand preferences, lifestyle segments, and demographic and behavioural variables. They found that different consumer segments reacted to different dimensions of brands, and reacted to marketing communications through brand preferences in ways that could be accurately modelled through lifestyle and demographic models. The results suggest that understanding the benefits sought by specific segments of the target markets is key to effective brand design and product positioning.

Jin and Suh (2005) examined the effects of consumer perception factors in predicting private brand purchases. Their study considered four consumer characteristic variables, namely price consciousness, value consciousness, perceived price variation, and consumer innovativeness towards private brand purchases, and evaluated the resulting purchase intentions. They showed that the contribution of the factors varied according to product categories. Consumer innovativeness, the predisposition to buy new and different products and brands rather than remain with previous choices and consumption

patterns, was found to be the strongest factor in predicting consumer attitude towards private brands in the study's sample. This result is analogous to the "innovators" in Moore's (1991) technology adoption life cycle being more likely to adopt new technologies. Jin and Suh issued a call for the examination of a wider range of products, and other cultures in further research.

Govers and Schoormans (2005) considered the symbolic meanings behind products that go beyond the products' functional utility, including concepts like brand personality and product-user image, which describe the symbolic meaning associated with the brand or product class, and the influence of these concepts on consumer preference. They used the conceptualization of a physical product, described with human personality characteristics, and defined it as product personality. The study demonstrated that people prefer products with a product personality that matches their self-image. This result has implications for product design, positioning, and marketing. It demonstrates that when a range of product variants that fulfill the same need are available to consumers, the company who has crafted the product to have a product personality that more closely matches a particular consumer's expression of their own individuality will be more likely to be selected by that consumer. When differentiation in a market based on price and functionality is difficult or marginal, product personality may be a significant third factor on consumer decision making.

Hirunyawipada and Paswan (2006) investigated the impact of consumer innovativeness and perceived risk on new product adoption. They first decomposed the construct of

consumer innovativeness into global, domain specific and actualized innovativeness; and further disaggregated global innovativeness into cognitive and sensory dimensions; and actualized innovativeness into actual adoption and the acquisition of novel information about new products. An intervening variable, perceived risk, was added to complete the innovativeness framework. The framework was tested using a survey. The results showed that consumers who display different types of innovation show different adoption behaviour. Cognitive innovators tend to adopt new products, while sensory innovators tend to acquire novel information about new products. The study also suggested that perceived risk significantly impacts the adoption of innovation. It contributed the insights that consumers are influenced by different elements of innovativeness differently, and that in order to market new products successfully, a careful balance of cognitive, sensory, and domain-specific innovativeness needs to be attained in a manner that matches the innovativeness of the target market. To reduce the perceived risk of consumers, financial risk is the most dire, and prices of new products must be carefully set to not discourage consumers from reaching the earliest stages of the adoption of new products. Hirunyawipada and Paswan concluded with a call for future studies to consider more product domains, and examine context-specific dimensions of perceived risks that might become salient in different aspects of consumer innovativeness.

Lin & Chen (2006) examined the impacts of country-of-origin image, product knowledge, and product involvement on consumer purchase decisions. Using structured questionnaires, they collected data from consumers and analyzed it to test hypotheses. The results showed that country-of-origin image, product knowledge and product

involvement all have a significant, positive effect on consumer purchase decisions. The implications of this study make clear that companies face global competition, and must adjust their marketing to create a favourable country-of-origin image, and an appropriate competitive strategy. Further, consumer product knowledge is key to a business' competitive strategy. It is essential that a company develop a marketing strategy that exposes a proper amount of relevant product information to assist consumers in absorbing it, and, in turn, raising their purchase intentions. The authors conclude with a call for the assessment of more products in additional countries beyond those considered in their study to improve the understanding of the observed effects.

Donio, Massari, and Passiante (2006) explored the link between customer loyalty attitude, customer purchasing behaviour, and profitability. They designed a conceptual framework, and empirically tested it. The results showed that purchasing behaviour is positively and significantly associated with customer profitability; that customer loyalty attitude is positively and significantly associated with customer profitability; and, that satisfaction, trust and commitment are positively and significantly associated with purchasing behaviour. The outcome of this study provided evidence that customer loyalty is an appropriate measure for customer segmentation of business markets, and that programs designed to build customer loyalty lead to cost savings and improved customer profitability. Donio, et al. conclude with a call for replication of the study's measures in additional contexts to assess whether the framework tested in this study holds up in other industries and consumer populations.

Essoussi and Zahaf (2008) examined the decision making process of community organic food consumers. They conducted an exploratory study, using focus groups to collect data, to explore the drives, motives, and values of community organic food consumers; to analyze consumers; point of purchase preferences in community organic food markets; and, to understand community organic food consumer trust with regards to organic food products, labeling, and the companies marketing those products.. The outcomes of the research showed that consumers lack in-depth knowledge of organic food products; that cultural values cause consumers to give priority to different values and means of achieving those values when making purchasing decisions; and, that community markets have different motivations and attitudes that influence their purchasing behaviour than do urban markets. This research has numerous managerial implications in identifying new types of consumers that will not be well handled with traditional marketing approaches. The major barriers that limit the demand for organic food, and the perceptions and attitudes and knowledge of community markets must be well understood to effectively promote products.

Customer satisfaction is defined as the difference between customer expectations for the performance, features, reliability, and characteristics of a product and its actual performance, features, reliability, and characteristics as experienced by the customer. When a customer is satisfied with a product, they are less likely to seek out alternative products. If a customer is lead to expect a lot from a product and the product is unable to live up to that expectation, the customer will be dissatisfied. However, if a customer does not expect much from a product, and the product delivers more than is expected, the

customer will be satisfied. Companies must be very careful with how they manage the expectations of their customers. Companies that strike the right balance between marketing their products in a way that makes them appealing, but does not create expectations that cannot be met will have more satisfied customers, and these customers will be less likely to seek out an alternative product (Bolton & Drew, 1991) The level of customer satisfaction is the most important criteria for maintaining customer loyalty and minimizing customer churn (Athanassopoulos, 2001).

A customer's level of involvement with a product affects their purchasing behaviour. When a customer gets excited about a product and gets involved in the community surrounding that product, they become more comfortable with the product. That comfort makes a move to a new product less appealing. The more they work with their current product, the more they understand it and identify with it. They find it more and more useful as they find more needs that it can fulfill. In the end, the more they are involved with the product, the more attached to it they become (Wakefield & Blodgett, 1999).

The trust between a customer and a company is a critical factor in the likelihood of a customer doing business with that company and using their products. Potential customers are concerned about being taken advantage of; they are concerned about receiving value for their investment; and, they are concerned about the privacy of their personal information. These factors are key to increasing the customer-company trust relationship and reducing the switching barriers, especially when interactions take place over the Internet (Koufaris & Hampton-Sosa, 2002).

Customers that recommend a product to a friend or colleague generate new interest in the product independent of the marketing efforts of the company that develops the product. This recommendation is the strongest predictor of increased adoption of the product. When customers put their reputation on the line to recommend a product, they feel strong loyalty to that product, and that loyalty is a barrier to adoption of competing products. Loyalty is one of many switching barriers, such as indifference, timing, and exit barriers, that competing companies face when trying to gain market share. A loyal customer may stick with a supplier whom they perceive as giving good value in the long term, even if the best value or outcome is not given in a particular interaction (Reichheld, 2003). Further, the greater the loyalty a company engenders amongst its customers, the greater the profits it reaps (Reichheld, 2001).

2.3.4   Ethical factors

Carrigan and Attalla (2001) examined whether or not consumers care about ethical behaviour, and investigated the effect of good and bad ethical conduct on consumer purchasing behaviour. They reviewed evidence that consumers make purchasing decisions based on their perceptions of how ethical a company is and argue that the issue may be oversimplified. They highlighted that past evidence had suggested that consumers tend to punish unethical behaviour by boycotting companies, and that they do not necessarily reward ethical behaviour with increased consumption. In their study, they found that ethics, in fact, do not much influence consumer purchasing behaviour. Consumers pay little heed to ethical considerations in their decision-making behaviour,

especially when the issues at question are perceived to be irrelevant, hopeless, or distant causes that don't directly impact them or their daily lives. Only if a consumer was directly impacted by an ethical behaviour did she take action and change her purchasing behaviour. Their findings raise questions about whether or not identification with a moral or ethical cause, and the associated marketing efforts of a company to promote their stance and participation in that cause actually motivate consumers to switch to its products.

Tan (2002) examined the influence of consumers' moral intensity, perceived risk, and moral judgement on their purchase intention of pirated software. He separated these factors into multiple aspects. Moral intensity was divided into the magnitude of consequence, social consensus, the probability of effect, and temporal immediacy. Perceived risk was divided into financial, performance, prosecution, and social risks. Moral judgement was considered from the perspective of cognitive models of moral development and reasoning. Through hierarchical regression analysis, Tan isolated the aspects of each factor that had a negative association with purchase intension. The experiment showed that the more serious the potential consequences of an unethical decision, the less likely the consumer is to make such a decision; that the degree of social acceptability of an unethical decision influences the consumer's behaviour; and, that cognitive judgement and moral reasoning are significant predictors of a consumer's purchase intentions. This work raises questions about other cases where moral, ethical, and social factors might affect the decisions of consumers, such as when a consumer is considering piracy of one software versus legally using a competitor's software for free.

Tan issued a call for research into additional scenarios, such as different types of

computer software, and different ethical situations to better understand consumer

behaviour.

Ricks (2005) conducted an assessment of how strategic corporate philanthropy affected

consumer perceptions of brand equity. He empirically assessed the effects of various

categories and implementation strategies of strategic corporate philanthropy, including

general philanthropy, philanthropy directed at a specific segments, and active and

reactive philanthropy, on consumer perceptions of brand equity and patronage intentions.

The results showed that corporate philanthropy has an overall positive effect on consumer

perceptions of corporate associations, but the effect is not reflected in brand evaluations

or patronage intentions. The evidence supported the notion that philanthropy is effective

for corporate or brand image objectives, but confers no benefit in improving consumer

brand evaluation or purchase objectives. The outcomes of this study clarified the value of

philanthropic activity on consumer perceptions of firms and the brands they market.

Wang, Zhang, Zang, and Ouyang (2005) established and empirically validated a model

for analyzing consumers engaging in software piracy. Using a survey, they assessed

Chinese consumers' attitude towards software piracy. The results showed that four

personal and social factors were found to influence consumers' attitude towards software

piracy, including value consciousness, normality susceptibility, novelty seeking and

collectivism. Five attitude measures were identified that influenced consumer purchase

intentions, namely reliability of pirated software, recognized social benefits of piracy,

functionality of pirated software, risks of purchasing, and perceived legality of

purchasing. Comparing consumer attitudes revealed that attitudes were different between

buyers and non-buyers of pirated software, with buyers generally finding that purchasing

counterfeit products was less risky, worthier of purchase, will benefit society and

entertainers more, less unethical, and that stores selling counterfeits can be trusted. The

results further showed that integrity does not influence consumers' attitude towards

software piracy. Outside motivation is more important than inner virtues when it comes

to purchase intentions. Factors such as novelty seeking were found to be far more

significant than the traditional assumption that consumers engaging in piracy do so

maliciously. Consumers engage in software piracy sometimes just as a way to try out

new software in an environment where business information about the software is not

readily available. The outcomes of this study have many implications for companies

attempting to segment customers with an anti-piracy marketing platform.

2.3.5 Circumstantial factors

Aqueveque (2006) investigated the influence of consumption situation on the use of

extrinsic cues such as price and expert opinion in the assessment of different types of risk

associated to purchase decisions. Using an experimental design that manipulated the

consumption situation, price, and expert opinion about a test product, different types of

risk associated with the purchase decision and purchase intention were measured. The

results suggested that in a consumption situation where negative expert opinion about the

product was in play, the use of price in the assessment of performance risk was affected.

In addition, positive expert opinion was demonstrated to have a strong effect in reducing performance risk and increasing intention to buy. The study has implications for the use of expert opinions to reduce consumer perceptions of performance risk, and increasing their intention to buy. Aqueveque concluded with a call for testing of the hypothesized model with different product categories to increase the robustness of the results.

Xue (2008) examined the moderating effects of product involvement on situational brand choice. Using television commercials as advertising stimuli, participants in the experiment answered questions that measured their level of product involvement and estimated their likelihood of using the advertised brand. The results of analysis of the responses showed that there was a significant situational factor in consumer brand choice. In high sophistication situations, participants were more likely to choose a highly sophisticated brand. In low sophistication situations, participants were more likely to choose a less sophisticated brand. Further, participants that were more involved with the brand, in that their self-concept of high or low sophistication matched that of the brand, were more likely to choose that brand. This study has implications for market segmentation of target consumers, and supports the notion that consumer self-concept and situational variables are both strong factors in determining consumers' brand choice. Xue issued a call for studies of more products to examine for which product categories these results hold. He also advocated the examination of cross-cultural influences and how they may change self-concept and resulting brand choice.

2.4 Sun and OpenOffice.org

Sun Microsystems, Inc. is a large, multinational corporation with engineering teams around the world. They have a long-standing tradition of building systems based on open standards. Their release of their proprietary StarOffice office suite as OpenOffice.org a continuation of this strategy. Their goal, amongst other things, was to improve the usability of the product through the collaborative work of the open source community (Benson, Müller-Prove, & Mzourek, 2004). The OpenOffice.org suite was originally based on version 5.2 of StarOffice, released in 2000, and has since become the code base for subsequent StarOffice releases (Rautiainen, 2003). The suite originally consisted of three major applications: Writer, for word processing; Calc, for spreadsheets; and Impress, for presentations. Version 2.4, released in March of 2008 also features Draw, for graphics design; Math, for mathematical equation editing; and Base, for databases. It is available in over 100 languages and works on all common computers. OpenOffice.org is released under the LGPL license (Free Software Foundation, 2007)

The release of OpenOffice.org is a multi-faceted strategic move for Sun. It supports the sale of comprehensive support and training services that Sun offers to users of OpenOffice.org. With the huge distribution, enabled by the move to open source, many companies are using OpenOffice.org and there is a high demand for service to support it (Preimesberger, 2003). It also supports the sale of Sun's StarOffice-branded version of OpenOffice.org, which provides enterprise value-add components, administration tools, commercial quality spell-checker and relational database (Sun Microsystems, 2008).

Sun has made open source the central focus of its software strategy and a key part in the way the company develops and distributes software. With its roots in the company's heritage, and a culture of sharing in the company, the management of Sun saw open source as an inevitable movement in the industry, and chose to take a leading role in the community. The move to release OpenOffice.org was aimed at improving their positioning at the application layer of the technology stack. The company is vertically diversified, with controlling interests at all layers of the stack, including chip, operating system, and database. The move has resulted in a tremendous volume increase in application sales and support subscriptions (Derringer, 2008), due in part to the more than 120 million downloads of the software from its primary distribution website (OpenOffice.org, 2008a). It has also resulted in direct competition with Microsoft, the incumbent in the office suite space. By releasing a competitive, feature-rich product that is comparable to Microsoft's offering, and free for users to download and distribute, Sun aims to devalue the investments Microsoft made into the development of Microsoft Office, and drive down the price of the software, which will put pressure on Microsoft through lost revenue (Wagner, 2005). The release has reduced Microsoft's dominant market share. Sun aims to have OpenOffice.org installed on 400 million PCs worldwide by 2010 (OpenOffice.org, 2008b).

Sun is also looking to use OpenOffice.org as part of its Software as a Service (SaaS) strategy for which they are still working on a business model. Web-only versions of OpenOffice.org are now available that do not require the installation of any software on the users' computers (Nichols, 2007).

The decision to switch from Microsoft Office to OpenOffice.org is likely to occur at "trigger points" that influence a user's decision-making, such as the acquisition of a new PC, end-of-life of current office suite, or a change in needs that will require additional functionality. Sun has aligned the OpenOffice.org marketing strategy to target users in those situations. An in depth understanding of switching barriers is key to implementing this strategy successfully (OpenOffice.org, 2008b).

2.5   Lessons learned

This section discusses the lessons learned from the literature review. Table 1 summarizes the motivations of companies to participate in open source software development.

Motivations	References
Hasten product adoption	Dahlander (2004)
Establish a platform	Dahlander (2004)
Sell complementary products	Dahlander (2004); Hohensohn & Hang (2003); von Hippel & von Krogh (2003)
Commoditize competitor's offering	Henkel (2003); Hohensohn & Hang (2003)
Improve customer retention, satisfaction, trust, and loyalty	Hohensohn & Hang (2003); Andersson, et al. (2005)
New sources of innovation	Goldman & Gabriel (2004)
Increases brand value	Andersson, et al. (2005)

Table 1: Motivations of companies to participate in open source software development

Table 2 summarizes the motivations of individuals to participate in open source software development.

Motivations	References
Be a part of a community	Bonaccorsi & Rossi (2006)
Access to a free support network	Henkel (2003)
Build a reputation	Lerner & Tirole (2001)

Table 2: Motivations of individuals to participate in open source software development

Table 3 summarizes the motivations of users to use open source software.

Motivations	References
Get a job done	Bonaccorsi & Rossi (2006)
Save money	Koenig (2004)
Support social and political movement	Stallman (1985)
Avoid vendor lock-in	Kollock (1999)

Table 3: Motivations of users to use open source software

Table 4 summarizes the concerns surrounding open source software adoption.

Concerns	References
Security	Lawton (2002)
Company motives	DiBona, et al. (2006); Hohensohn & Hang (2003)
Product is low quality	Nichols & Twidale (2002)
Product is hard to use	Nichols & Twidale (2002)

Table 4: Concerns surrounding open source software adoption

Table 5 summarizes the switching barriers between Microsoft Office and OpenOffice.org.

Switching Barriers	References
Fewer capabilities / features	Stafford (2006); Scoble (2006); Ridling (2007)
Compatibility problems with MS Office (forms, macros, templates, etc.)	Stafford (2006); Dolinar (2008); Matzan (2005); OpenOffice.org (2008b)

Switching Barriers	References
Compatibility problems with third party applications / add-ons	Stafford (2006); Scoble (2006); Dolinar (2008); OpenOffice.org (2008b); Huysmans, Ven, & Verelst (2008)
User resistance to change	Stafford (2006); Miller (2006); OpenOffice.org (2008b); Huysmans, Ven, & Verelst (2008)
User preconceptions	Stafford (2006)
Bias against non-Microsoft companies / comfort with Microsoft	Stafford (2006); Scoble (2006); OpenOffice.org (2008b)
Lack of training and reference material options for OO.org	Miller (2006); OpenOffice.org (2008b)
Exclusivist culture of developers and users of OO.org	Miller (2006)
Users used to MS Office interface	Miller (2006); Matzan (2005)
Slower performance of OO.org	Miller (2006); Scoble (2006); Ridling (2007); OpenOffice.org (2008b)
Security flaws in OO.org	McMillan (2006)
Less powerful dictionary in OO.org	Matzan (2005)
Lack of grammar check feature in OO.org	Matzan (2005)
Discounted versions of MS Office available	Scoble (2006)
OO.org is less flexible than MS Office	Scoble (2006)
Loss of productivity as result of switch	Scoble (2006)
Lack of modularity in OO.org	Ridling (2007); OpenOffice.org (2008b)
Dependence on MS Proprietary data formats / closed standards	Dolinar (2008); OpenOffice.org (2008b)
User indifference	OpenOffice.org (2008b)
Concerns about open source license of OO.org	OpenOffice.org (2008b)
Not pre-installed on new computers	OpenOffice.org (2008b)
Lack of awareness of support options for OO.org	OpenOffice.org (2008b)
Lack of user awareness of OO.org availability	OpenOffice.org (2008b)
Network effects	Huysmans, Ven, & Verelst (2008)

Table 5: Switching barriers between Microsoft Office and OpenOffice.org

Table 6 summarizes the switching motivators between Microsoft Office and

OpenOffice.org.

Switching motivators	References
Novel / more features	Haugland (2008); Ridling (2007); Gralla (2008); Ciurana (2004); OpenOffice.org (2008d); OpenOffice.org (2008b)
Social pressure	Haugland (2008); OpenOffice.org (2008d)
Bias against Microsoft	Haugland (2008); OpenOffice.org (2008b)
OO.org is available at no cost	Haugland (2008); Ridling (2007); Gralla (2008); Ciurana (2004); OpenOffice.org (2008d); OpenOffice.org (2008b)
Reasons of principle supporting OS movement	Haugland (2008); Schulz (2008); OpenOffice.org (2008d)
Comparable switching effort to upgrading to newer version of MS Office	Haugland (2008); Gralla (2008); OpenOffice.org (2008b)
Open file format / standards	Ridling (2007); Gralla (2008); Schulz (2008); Ciurana (2004); OpenDocument Format Alliance (2007); IDABC (2006); NATO (2007); Deckmyn (2006); OpenOffice.org (2008d); OpenOffice.org (2008b)
More supported languages / localizations	Ridling (2007); OpenOffice.org (2008d); OpenOffice.org (2008b)
Smaller document size	Ridling (2007)
Multi/cross-platform support	Ridling (2007); OpenOffice.org (2008b)
Easier to customize	Ridling (2007); OpenOffice.org (2008d)
OS license desirable	Ridling (2007); Schulz (2008); OpenOffice.org (2008d)
Lack of anti-piracy harassment features	Ridling (2007)
Easier to learn and use	Ridling (2007); Gralla (2008); OpenOffice.org (2008d); OpenOffice.org (2008b)
Lower deployment and testing time	Ciurana (2004)
Better security	Ciurana (2004); Farnum (2006); OpenOffice.org (2008d); OpenOffice.org (2008b)
More support options	Ciurana (2004); OpenOffice.org (2008d); OpenOffice.org (2008b)
Better compatibility / interoperability	Ciurana (2004); OpenOffice.org (2008d); OpenOffice.org (2008b)
Avoid legal problems with pirated software	OpenOffice.org (2008c); Beer (2006)
No concerns about audits / compliance	OpenOffice.org (2008d); OpenOffice.org (2008b)
Higher quality software	OpenOffice.org (2008d)
No vendor lock-in	Ridling (2007); OpenOffice.org (2008d); OpenOffice.org (2008b)
Availability of development toolkits	OpenOffice.org (2008d)

Switching motivators	References
Build and maintain a community	OpenOffice.org (2008d)
Users are overserved by MS Office	OpenOffice.org (2008b)
Ability to inspect OO.org code	OpenOffice.org (2008d); OpenOffice.org (2008b)
OO.org is more stable	OpenOffice.org (2008b)

Table 6: Switching motivators between Microsoft Office and OpenOffice.org

Table 7 summarizes consumer behaviour towards purchasing or switching products or services.

Consumer behaviour	References
Relationship investment reduces likelihood of switching	Colgate & Lang (2001); Donio, et al. (2006); Koufaris & Hampton-Sosa (2002); Reichheld (2003)
Switching costs reduce likelihood of switching	Colgate & Lang (2001); Hirunyawipada & Paswan (2006); Kwon, et al. (2008); Wakefield & Blodgett (1999); Reichheld (2003)
Availability and attractiveness of alternatives increase likelihood of switching	Colgate & Lang (2001); del Río, et al. (2001); Bolton & Drew (1991)
Service recovery reduces likelihood of switching	Colgate & Lang (2001); Athanassopoulos (2001)
Apathy is primary consumer switching barrier	Colgate & Lang (2001); Reichheld (2003)
Negative factors are strong consumer switching barriers	Colgate & Lang (2001); Hirunyawipada & Paswan (2006); Aqueveque (2006); Kwon, et al. (2008); Wakefield & Blodgett (1999); Reichheld (2003)
Brand guarantee positively affects consumer purchasing behaviour	del Río, et al. (2001); Essoussi & Zahaf (2008)
Personal identification with product/service positively affects consumer purchasing behaviour	del Río, et al. (2001); Hirunyawipada & Paswan (2006); Lin & Chen (2006); Essoussi & Zahaf (2008); Kwon, et al. (2008); Wakefield & Blodgett (1999)
Social identification with product/service positively affects consumer purchasing behaviour	del Río, et al. (2001); Essoussi & Zahaf (2008)
Social status match to product/service positively affects consumer purchasing behaviour	del Río, et al. (2001)
Product familiarity increases consumer understanding of their own purchasing behaviour	Riquelme (2001)
Direct experience with product increases consumer understanding of their own purchasing behaviour	Riquelme (2001)

Consumer behaviour	References
Proximity of impact of unethical behaviour by company affects consumer purchasing behaviour	Carrigan and Attalla (2001)
Ethical behaviour by a company does not impact consumer purchasing behaviour	Carrigan and Attalla (2001)
Perceived seriousness of potential consequences of unethical purchasing behaviour reduces consumer unethical purchasing behaviour	Tan (2002); Wang, et al. (2005); Essoussi & Zahaf (2008)
Degree of social acceptance of unethical purchasing behaviour influences consumer unethical purchasing behaviour	Tan (2002); Wang, et al. (2005)
Consumer moral reasoning predicts likelihood of unethical purchasing behaviour	Tan (2002); Wang, et al. (2005)
Social class predicts evaluation criteria importance	Williams (2002)
Gender predicts evaluation criteria importance	Williams (2002)
Social affiliation values do not affect consumer purchase motivations	Kim, et al. (2002)
Consumer needs drive purchasing behaviour	Kim, et al. (2002)
Consumer demographics predict how consumers react to brand dimensions of utility	Orth, et al. (2004); Essoussi & Zahaf (2008)
Localized products are favoured by consumers	Ang, et al. (2004); Lin & Chen (2006); Essoussi & Zahaf (2008)
Consumer innovativeness predicts attitude towards private brands.	Jin & Suh (2005); Xue (2008); Kwon, et al. (2008)
Corporate philanthropy does not improve consumer patronage intentions.	Ricks (2005)
Consumers prefer products with a product personality that matches their self-image.	Govers & Schoormans (2005); Xue (2008)
Brand visibility improves consumer perceptions of brand quality	Wulf, et al. (2005)
Consumer innovativeness affects consumer innovation adoption behaviour	Hirunyawipada & Paswan (2006)
Perceived risk reduces consumer innovation adoption behaviour	Hirunyawipada & Paswan (2006)
Positive expert opinion reduces consumer perceived performance risk of a product	Aqueveque (2006)
Positive expert opinion increases consumer intention to buy a product	Aqueveque (2006)
Presence of expert opinion impacts consumer use of price in assessment of performance risk of a product	Aqueveque (2006)
Product knowledge improves customer purchase intentions	Lin & Chen (2006)

Consumer behaviour	References
Product involvement improves customer purchase intentions	Lin & Chen (2006); Xue (2008); Kwon, et al. (2008); Wakefield & Blodgett (1999)
Customer loyalty improves customer profitability	Donio, et al. (2006); Reichheld (2001)
Satisfaction, trust, and commitment improve customer purchase behaviour	Donio, et al. (2006); Essoussi & Zahaf (2008); Bolton & Drew (1991); Koufaris & Hampton-Sosa (2002)
Situational variables influence consumer purchasing behaviour	Xue (2008)
Community markets have different motivations and attitudes that influence their purchasing behaviour than urban markets	Essoussi & Zahaf (2008)
Cultural values change consumer prioritization of product values in their purchasing decisions	Essoussi & Zahaf (2008)
Consumers are more likely to buy private brands of products that have search properties	Kwon, et al. (2008)
Customer satisfaction is the difference between customer expectations and experiences with the performance, features, reliability, and characteristics of a product or service	Bolton & Drew (1991); Athanassopoulos (2001)

Table 7: Consumer behaviour towards products and services

While there are lots of descriptions of the switching barriers between Microsoft Office and OpenOffice.org in the literature, there is a lack of empirical research to support them. There is a call by authors in the open source literature to conduct empirical assessments open source software deployments, specifically in areas that deviate from the traditional software models (Koch, 2004).

There has been little consideration in the literature for desktop open source software, such as office suites. The focus has largely been on enterprise open source software. There is also little distinction in the literature between software developed by the open source community at large and software developed by a for-profit company that is subsequently released as open source.

The traditional focus in the literature has been on adoption of desktop software in corporate environments. There has been little examination of adoption of open source software by users for their personal computers, and the factors that affect their decision making process.

Colgate and Lang (2001) found that there are four major groups of switching barrier, relationship investment, consisting of all the things a company does to build a relationship with its customers that goes above and beyond the product or service they provide itself; negativity, consisting of all the consequences of switching product or service that may be perceived as negative to the customer, including switching costs, adaptation to the new product or service, perceived risk, and vendor lock-in; apathy, consisting of the effort and circumstantial barriers to motivate a customer to change product or service, and the perception that all products and services in a particular category are the same anyways; and, service recovery, consisting of the efforts of a company to resolve the complaints and problem reports from their customers to their customers' satisfaction. There is a call by academics to research switching barriers in additional industries to contribute to the advancement of consumer marketing theory (Colgate & Lang, 2001). There are no empirical assessments of consumer switching barriers between office suites, or between closed source and open source software in the literature.

The ethical factor in consumer decision making has been considered in many situations. Academics have issued a call for research into additional scenarios, such as different

types of computer software, and different ethical situations to better understand consumer

behaviour (Tan, 2002). There are no empirical assessments in the literature of the ethical

factors that affect consumer decision making when considering the adoption of open

source software, or when considering switching office suites.

The impact of social class on consumer decisions has been examined in the literature in

several contexts. There is a call by academics to study the impact of social class on

consumer decisions surrounding product-specific criteria for narrowly defined products

to improve the understanding of the effects of social class factors on consumer behaviour

(Williams, 2002). There are no empirical assessments of the impact of consumer social

class factors on consumer adoption of open source software, or on the consumer

valuation of the product-specific criteria of office suites in the literature.

Consumer innovativeness has been evaluated as a salient factor in consumer product

adoption. There is a call by academics to evaluate the impact of consumer innovativeness

on product adoption in additional product domains to improve the theoretical

understanding of this aspect of consumer behaviour (Hirunyawipada & Paswan, 2006).

There are no empirical assessments of the impact of consumer innovativeness on

consumer adoption of open source software, or on the switching barriers between office

suites in the literature.

The impact of consumer loyalty on consumer purchasing behaviour has been considered

in several industries. There is a call by academics to evaluate the relationship between

consumer purchasing behaviour and consumer loyalty measures in novel industries and additional consumer populations to improve the theoretical understanding in the literature (Donio, et al., 2006). There are no empirical assessments of the impact of consumer loyalty on consumer adoption of open source software, or on the switching barriers between office suites in the literature.

The impact of cultural values on consumer purchasing decisions has been evaluated in several industries. Academics have highlighted the importance of improving the understanding of this relation (Xue, 2008; Essoussi & Zahaf, 2008). There are no empirical assessments of the impact of cultural values on consumer adoption of open source software, or on the switching barriers between office suites in the literature.

Product involvement is a factor that significantly affects customer purchase intentions (Lin & Chen, 2006; Xue, 2008; Kwon, et al., 2008; Wakefield & Blodgett, 1999). There are no empirical assessments of the impact of product involvement on consumer adoption of open source software, or on the switching barriers between office suites in the literature.

3 Research method

This chapter describes the research method used in this thesis. The research method is adapted from the methodology used in Colgate and Lang's (2001) research on the switching barriers in consumer markets. The first section describes the hypothesis development. The second section describes the survey design. The third section describes the creation of the questionnaire.

3.1 Hypothesis development

This section describes the development of the hypotheses. First, each of the switching barriers identified in the open source, and technical and trade literature pools were classified into the four categories of switching barriers as formulated by Colgate and Lang (2001). Hypotheses were created that describe the expected effect each classification of factors had on the respondent's decision to not switch office suites.

Second, the user characteristics related to purchasing or switching products or services identified in the literature were collected. Hypotheses were created that describe the expected variance of user characteristics between respondents who have considered switching from Microsoft Office to OpenOffice.org, and respondents who have not.

The following parts describe the formulation of each of the hypotheses derived from the literature.

3.1.1 Hypothesis 1 – Relationship investment

Colgate and Lang (2001) found that one class of switching barriers is related to

relationship investment. The open source and consumer and trade literature pools report

numerous switching barriers between Microsoft Office and OpenOffice.org that relate to

relationship investment. Several authors cite comfort with Microsoft as a potential

switching barrier (Stafford, 2006; Scoble, 2006; OpenOffice.org, 2008b). Miller (2006)

describes the exclusivist culture of developers and users of OpenOffice.org as a potential

switching barrier. Scoble (2006) proposed that discounted versions of Microsoft Office

deter users from switching office suites. Numerous authors have also described factors

related to relationship investment that they feel may increase switching behaviour.

However, user perceptions may be contrary to the views the authors express. As such,

these factors need to also be considered. Social pressure has been suggested as a

significant reason users switch to OpenOffice.org (Haugland 2008; OpenOffice.org

2008d). Several authors have suggested that users switch to OpenOffice.org because they

support the principles of the open source movement (Haugland, 2008; Schulz, 2008;

OpenOffice.org, 2008d). The availability of OpenOffice.org in numerous languages and

localizations has been considered by several authors as a motivation for users to switch

(Ridling, 2007; OpenOffice.org, 2008b; OpenOffice.org, 2008d). OpenOffice.org

(2008d) has reported that a desire to build and maintain a community may motivate users

switching to OpenOffice.org. OpenOffice.org (2008b) also considered the issue that

many users may be overserved by Microsoft Office, and listed it as a major reason users

switch to OpenOffice.org. Overserved customers often complain about overly complex,

expensive products and services; do not value these features, and hence do not use them; and, do not reward innovation with price premiums (Christensen, 1997).

Colgate and Lang (2001) list two factors that they classify as relationship investment switching barriers. These factors are operationalized as the notions that users feel that Microsoft understands their needs; and, that users feel that Microsoft Office is the best deal overall.

These factors are collectively taken to represent the switching barriers related to relationship investment. There is no reason to believe that relationship investment in the case of office suites is any different than for the situations examined by Colgate and Lang (2001). It is likely that users are influenced in their switching consideration by relationship investment efforts made by Microsoft to keep them as a customer. This theory leads to hypothesis 1:

H1: Relationship investment is a significant switching barrier between Microsoft Office and OpenOffice.org

Each of the factors related to relationship investment are considered separately as sub-hypotheses H1-A through H1-J to examine their separate contributions to the overall classification of relationship investment. When the factors in the literature were expressed as switching motivators, the factors were expressed negatively to turn them into switching barriers. Each of these factors considers an individual user perception, and

may not be related to reality. It is the users' perceptions that affect their switching

decisions. If these perceptions are faulty, but the user maintains they are true, a gap in the

dissemination of information about the product is identified. Table 8 shows each sub-

hypothesis and theorizes on the contribution, positive or negative, of each factor towards

the switching barrier of relationship investment. A plus sign indicates that it is

hypothesized that the factor strengthens the relationship investment classification in terms

of its impact as a switching barrier. A minus sign indicates that it is hypothesized that the

factor weakens the relationship investment classification in terms of its impact as a

switching barrier, that is to say, the factor is a switching motivator.

Switching barrier	Hypothesis	Direction
Comfortable with Microsoft	H1-A	+
OpenOffice.org has an exclusivist culture associated with it	H1-B	+
Microsoft offers discounted versions of Microsoft Office	H1-C	+
Users are told to not switch from Microsoft Office to OpenOffice.org	H1-D	+
Users do not believe in the principles of the open source movement	H1-E	-
OpenOffice.org does not meet user language or localization needs	H1-F	-
User has no interest in building and maintaining an open source community	H1-G	+
Users are not overserved by Microsoft Office	H1-H	-
Microsoft understands users' needs	H1-I	+
Microsoft Office is the best deal overall	H1-J	+

Table 8: Switching barriers classified as relationship investment

3.1.2   Hypothesis 2 – Negativity

Colgate and Lang (2001) found that another class of switching barriers is related to

negativity. The open source and consumer and trade literature pools report numerous

switching barriers between Microsoft Office and OpenOffice.org that relate to negativity.

Some of the most commonly suggested switching barriers are the fewer features and capabilities of OpenOffice.org (Stafford, 2006; Scoble, 2006; Ridling, 2007); the compatibility problems with OpenOffice.org (Stafford, 2006; Dolinar, 2008; Matzan, 2005; OpenOffice.org, 2008b); the lack of training and reference material for OpenOffice.org (Miller, 2006; OpenOffice.org, 2008b); that users are used to the Microsoft Office interface (Miller, 2006; Matzan, 2005); and, the slower performance of OpenOffice.org (Miller, 2006; Scoble, 2006; Ridling, 2007; OpenOffice.org, 2008b). McMillan (2006) suggests that OpenOffice.org has poor security, and that this may be a significant concern to users considering switching. Matzan (2005) suggests that users may be put off by OpenOffice.org's poor spell-checking tools. Scoble (2006) argued that OpenOffice.org is less flexible than Microsoft Office, and that users would lose productivity as a result of switching.

OpenOffice.org (2008b) reviewed the switching barriers that hindered adoption of its office suite and reached several conclusions that were echoed by other authors, namely that the lack of modularity of OpenOffice.org is problematic (Ridling, 2007); that dependence on Microsoft Office's file formats hinders user switching (Dolinar, 2008); that some users may be concerned about the open source license of OpenOffice.org; that users perceive that there are fewer support options for OpenOffice.org; and, that users are not aware of the availability of OpenOffice.org.

OpenOffice.org (2008b; 2008d) also reviewed numerous factors related to users switching to its office suite where it felt the OpenOffice.org office suite had an advantage

over Microsoft Office. It is possible that, while OpenOffice.org feels these factors are strengths, user perceptions are contrary. These factors also need to be considered. The reported factors were that OpenOffice.org is higher quality software; that development toolkits are readily available; that users have the ability to inspect OpenOffice.org's code; that OpenOffice.org is more stable; that OpenOffice.org documents are smaller (Ridling, 2007); that OpenOffice.org has strong multi-platform support (Ridling, 2007); that OpenOffice.org is easy to customize (Ridling, 2007), and, the lack of anti-piracy harassment features in OpenOffice.org (Ridling, 2007).

Numerous authors have listed factors that appear to favour the switching to OpenOffice.org. However, it is possible that user perceptions may be contrary to what the authors assert, so these factors should also be considered. These factors were that OpenOffice.org is easier to learn and use (Ridling, 2007; Gralla, 2008; OpenOffice.org, 2008b; OpenOffice.org, 2008d); that the deployment and testing time of OpenOffice.org is lower (Ciurana, 2004); that OpenOffice.org has no legal problems related to pirated software (OpenOffice.org, 2008c; Beer, 2006); and, that users of OpenOffice.org need not have concerns about audits and compliance verification (OpenOffice.org, 2008d; OpenOffice.org, 2008b).

Colgate and Lang (2001) list two switching barriers that they classify as negativity. These switching barriers are operationalized as the notions that users are concerned about the negative outcomes of switching from Microsoft Office to OpenOffice.org; and, that users are uncertain of the outcome of switching from Microsoft Office to OpenOffice.org.

These factors are collectively taken to represent the switching barriers related to negativity. There is no reason to believe that the impact of negativity in the case of switching office suites is any different than for the situations examined by Colgate and Lang (2001). It is likely that users are cognisant of the potential negative outcome of switching office suites and that this concern acts as a significant switching barrier. This theory leads to hypothesis 2:

H2: Negativity is a significant switching barrier between Microsoft Office and
    OpenOffice.org

Each of the factors related to negativity are considered separately as sub-hypotheses H2-A through H2-BB to examine their separate contributions to the overall classification of negativity. When the factors in the literature were expressed as switching motivators, the factors were expressed negatively to turn them into switching barriers. Table 9 shows each sub-hypothesis and theorizes on the contribution, positive or negative, of each factor towards the switching barrier of negativity. A plus sign indicates that it is hypothesized that the factor strengthens the negativity classification in terms of its impact as a switching barrier. A minus sign indicates that it is hypothesized that the factor weakens the negativity classification in terms of its impact as a switching barrier, that is to say, the factor is a switching motivator.

Switching barrier	Hypothesis	Direction
OpenOffice.org has fewer features or capabilities	H2-A	+
OpenOffice.org has compatibility problems	H2-B	+

Switching barrier	Hypothesis	Direction
Lack of training or reference material for OpenOffice.org	H2-C	+
Users are habituated to Microsoft Office interface	H2-D	+
OpenOffice.org is slower	H2-E	+
OpenOffice.org has worse security	H2-F	+
OpenOffice.org has worse spell-checking tools	H2-G	+
OpenOffice.org is less flexible	H2-H	+
Users will suffer a decrease in productivity by switching to OpenOffice.org	H2-I	+
OpenOffice.org is less modular	H2-J	+
Users are dependent on Microsoft Office file formats	H2-K	+
Users are concerned about OpenOffice.org's open source license	H2-L	+
OpenOffice.org has fewer support options	H2-M	+
Users are unfamiliar with the availability of OpenOffice.org	H2-N	+
OpenOffice.org has a larger file size	H2-O	+
OpenOffice.org is not available on user's platform	H2-P	--
OpenOffice.org is more difficult to customize	H2-Q	+
OpenOffice.org has harassing anti-piracy features	H2-R	-
OpenOffice.org is harder to learn and use	H2-S	+
OpenOffice.org takes longer to install and test	H2-T	--
OpenOffice.org is a legal risk	H2-U	--
OpenOffice.org creates problems with audits and compliance verification	H2-V	--
OpenOffice.org is lower quality software	H2-W	+
OpenOffice.org does not have development toolkits readily available	H2-X	-
Anyone can inspect OpenOffice.org's code	H2-Y	-
OpenOffice.org is less stable	H2-Z	+
Users are concerned about the negative outcomes of switching	H2-AA	+
Users are uncertain of the outcome of changing office suites	H2-BB	+

Table 9: Switching barriers classified as negativity

3.1.3 Hypothesis 3 – Apathy

Colgate and Lang (2001) found that another class of switching barriers is related to apathy. The open source and consumer and trade literature pools report numerous

switching barriers between Microsoft Office and OpenOffice.org that relate to apathy. Some of the most commonly listed switching barriers are that users are resistance to change (Stafford, 2006; Miller, 2006; OpenOffice.org, 2008b); that users are indifferent (OpenOffice.org, 2008b); that OpenOffice.org is not pre-installed on new computers (OpenOffice.org, 2008b), and, that at the time of switching considering, a user was not planning on upgrading to a newer office suite (Haugland, 2008; Gralla, 2008; OpenOffice.org, 2008b).

Colgate and Lang (2001) list two switching barriers that they classify as apathy. These switching barriers are operationalized as the notions that users feel all office suites are the same; and, that users feel it is too much bother to switch office suites.

These factors are collectively taken to represent the switching barriers related to apathy. There is no reason to believe that the impact of apathy in the case of switching office suites is any different than for the situations examined by Colgate and Lang (2001). It is likely that users are just as apathetic towards office suites as they are towards any other product or service switching decision. This theory leads to hypothesis 3:

H3: Apathy is a significant switching barrier between Microsoft Office and

OpenOffice.org

Each of the factors related to apathy are considered separately as sub-hypotheses H3-A through H3-F to examine their separate contributions to the overall classification of

apathy. All the factors discovered in the literature were presented as switching barriers and did not require restatement as negative factors. Table 10 shows each sub-hypothesis and theorizes on the contribution, positive or negative, of each factor towards the switching barrier of apathy. A plus sign indicates that it is hypothesized that the factor strengthens the apathy classification in terms of its impact as a switching barrier. A minus sign indicates that it is hypothesized that the factor weakens the apathy classification in terms of its impact as a switching barrier, that is to say, the factor is a switching motivator.

Switching barrier	Hypothesis	Direction
Users are resistant to change	H3-A	+
Users are indifferent	H3-B	+
OpenOffice.org is not pre-installed on new computers	H3-C	+
User was not planning on upgrading to newer office suite	H3-D	+
Users feel all office suites are the same	H3-E	+
Users feel it is too much bother to switch	H3-F	+

Table 10: Switching barriers classified as apathy

3.1.4 Hypothesis 4 – Service recovery

Colgate and Lang (2001) found that the last class of switching barriers is related to service recovery. The open source and technical and trade literature pools do not report on any factors that relate to service recovery as switching barriers between Microsoft Office and OpenOffice.org.

Colgate and Lang (2001) list one switching barrier that they classify as service recovery.

This switching barrier is operationalized as the notion that Microsoft successfully resolves users' complaints, and that this is a switching barrier between Microsoft Office and OpenOffice.org.

There is some reason to believe that the impact of service recovery in the case of switching office suites may be different than for the situations examined by Colgate and Lang (2001). The sales, distribution, use, service, and support mechanisms in the software industry vary considerably from those of the retail banking and insurance industries. Users do not often send complaints directly to the company, or seek resolution to specific issues they have with the office suite. Colgate and Lang (2001) explain that service recovery is only a weak switching barrier because many customers do not complain, and, often, complaints or problems with a product or service reported to a company are not presented in a manner that can lead to service recovery. It is likely that in industries such as software, there are few opportunities for companies to directly resolve user complaints in a manner that satisfies them enough for the outcome of the process to be a switching barrier. This theory leads to hypothesis 4:

H4: Service recovery is not a significant switching barrier between Microsoft Office and OpenOffice.org

As there is only one identified factor related to service recovery, no sub-hypotheses were considered. The factor discovered in the literature was presented as a switching barrier and did not require restatement as a negative factor.

3.1.5 Hypothesis 5 – Ethical considerations

Tan (2002) found that ethical considerations affect customer purchasing intentions in the case of pirated software. In his research, he found that likelihood of consequence, degree of social acceptability, and cognitive judgement and moral reasoning with regards to piracy all affected a customer's decision to purchase pirated software. However, it is unclear if these results would hold in the case of users seriously considering switching office suites. Some authors have cited ethical concerns with the prevalent use of pirated versions of Microsoft Office, and have suggested that users may be motivated to switch to OpenOffice.org due to ethical considerations (OpenOffice.org, 2008b; Haugland, 2008; Shulz, 2008; Beer, 2006). Such a finding would be the same effect of the ethical factors Tan examined, only the ethical considerations would be motivating users to abandon pirated software, instead of hindering them from purchasing pirated software. As there has been considerable emphasis on piracy related policy in recent years at the international and federal level (Microsoft, 2006), and that mass media sources have been frequently reporting on proposed legislation that purports to combat piracy, it is likely that users are well aware of the potential consequences, and social acceptability surrounding pirated software, and have made a cognitive judgement or moral reasoning on the topic. It also seems likely that this judgement and reasoning would affect their likelihood to seriously consider switching office suites if they are using pirated software. This theory leads to hypothesis 5:

H5: Users' ethical considerations with regards to software piracy are significantly and positively correlated with the likelihood they have seriously considered switching office suites

3.1.6   Hypothesis 6 – Social class

Williams (2002) found that consumers' social class influences the relative importance they give to evaluation criteria when considering purchasing a product, which, in turn, moderated their purchasing intentions. It is unclear if these results would hold in the case of users seriously considering switching office suites. Some authors have suggested that certain evaluation criteria may not be as important to some classes of users (Stafford, 2006; Scoble, 2006; OpenOffice.org, 2008b; Haugland, 2008; Ridling, 2007; Gralla, 2008). The often-cited switching motivator that OpenOffice.org is available at no cost is likely a less important criterion to users with higher income, and hence they may not seriously consider switching office suites. Williams (2002) also found that the social significance of the product changes criterion importance ratings. Several authors have spoken about the reasons to switch based on social principle (Haugland, 2008; Schulz, 2008). These arguments suggest that OpenOffice.org is a socially significant product. Higher social class users may not be comfortable with the grass-roots nature of the open source movement, and, as a result, are unlikely to be motivated to switch office suites. Taken collectively, these arguments suggest that social class is likely to be a factor in users' switching consideration. This theory leads to hypothesis 6:

H6: Users' social class is significantly and negatively correlated to the likelihood they

    have seriously considered switching office suites

3.1.7 Hypothesis 7 – User innovativeness

Hirunyawipada and Paswan (2006) investigated the impact of consumer innovativeness on new product adoption. They showed that the level of consumers' innovativeness affects their adoption behaviour. It is unclear if these results would hold in the case of users seriously considering switching office suites. Numerous authors have cited the novel features, and technical advantages of OpenOffice.org as motivations to switch (Haugland, 2008; Ridling, 2007; Gralla, 2008; Ciurana, 2004; OpenOffice.org, 2008d). It is possible that more innovative users may be more motivated by the technical advantages of OpenOffice.org and hence be more likely to have seriously considered switching office suites. Conversely, less innovative users may perceive the risk of switching to be higher, as they are not interested in new technologies and are not in a hurry to adopt them. As a result, they may be less likely to have seriously considered switching office suites. This relation is comparable to adoption behaviour seen in the technology adoption life cycle, as described by Moore (1991). These arguments suggest that user innovativeness is likely to be a factor in users' switching consideration. This theory leads to hypothesis 7:

H7: Users' innovativeness is significantly and positively correlated to the likelihood they

    have seriously considered switching office suites

3.1.8   Hypothesis 8 – User loyalty

Donio, et al. (2006) explored the relationship between customer loyalty and purchasing behaviour. They found that the level of customer loyalty correlates positively with purchasing behaviour. It is unclear if users' loyalty would have the same effect on whether or not users seriously considering switching office suites. Several authors have described switching barriers that relate to customer loyalty (Stafford, 2006; Scoble, 2006; OpenOffice.org, 2008b; Miller, 2006; Haugland, 2008). It is possible that after many years of using Microsoft products, users feel loyalty towards Microsoft, and hence are reluctant to consider switching. This loyalty may lead to a user sticking with Microsoft even if a particular version of Microsoft Office does not satisfy them, as they perceive the overall relationship with the company as giving the best value on the long term (Reichheld, 2003). Donio, et al. (2006) described loyal users as those who are satisfied, trust the company, and are committed to it. It is likely that users who are satisfied with Microsoft Office are less interested in considering alternatives. Koufaris & Hampton-Sosa (2002) argued that trust between a customer and a company is a critical factor in the likelihood of the customer using the company's products. Users that trust Microsoft and are committed to the company are less likely to be interested in alternatives out of concern for the trustworthiness and the reliability of the company. Further, one of the reported concerns reported in the open source literature about open source software is that many users do not understand the motives of a company to release programs freely, and are hence suspicious of the company (DiBona, et al., 2006; Hohensohn & Hang, 2003)). As trust is a key factor in loyalty, this suspicion may be a barrier to the adoption

of OpenOffice.org These arguments suggest that user loyalty is likely to be a factor in users' switching consideration. This theory leads to hypothesis 8:

H8: Users' loyalty to Microsoft is significantly and negatively correlated to the likelihood they have seriously considered switching office suites

3.1.9 Hypothesis 9 – Cultural values

Essoussi & Zahaf (2008) demonstrated in their research that consumer cultural values affect purchasing decisions. They showed that cultural values cause consumers to give priority to different value metrics in their purchasing decisions. It is unclear if users' cultural values would have the same effect on whether or not users seriously considering switching office suites. Several authors have described switching motivators and barriers between Microsoft Office and OpenOffice.org that suggest that the cultural identification of users may lead them to value certain properties of one over another (Miller, 2006; Ridling, 2007; OpenOffice.org, 2008d). Certain proponents of the open source movement promote it as a cultural movement in addition to a technical revolution (Stallman, 1985). Research has also shown that one of the motivations of individuals to participate in open source software development revolves around their community involvement, and a sense of belonging (Bonaccorsi & Rossi, 2006). These arguments suggest that a user's cultural identification is likely to affect his likelihood to have seriously considered switching office suites. This theory leads to hypothesis 9:

H9: The level of user's cultural identification with the culture of the open source

movement is significantly and positively correlated to the likelihood they have

seriously considered switching office suites

3.1.10   Hypothesis 10 – Product involvement

Numerous authors have showed that product involvement is a factor that significantly

affects consumer purchase intentions (Lin & Chen, 2006; Xue, 2008; Kwon, el al., 2008).

It is unclear if product involvement has an effect on whether or not users seriously

considering switching office suites. Much of the literature on office suites focuses on the

product specific advantages and disadvantages of Microsoft Office and OpenOffice.org.

The authors suggest that users will be aided or hindered by the addition or removal of

various features (Haugland, 2008; Ridling, 2007; Gralla, 2008; Ciurana, 2004;

OpenOffice.org, 2008d). These arguments suggest that in order to notice the differences

between office suites, users must have a certain level of involvement to be familiar with a

product's features, and develop an opinion of their value. OpenOffice.org (2008b)

specifically targets users who are not vary involved with Microsoft Office as prime

candidates to switch. They suggest that such users are overserved by Microsoft Office.

Other authors have suggested that two of the major switching barriers between Microsoft

Office and OpenOffice.org are user familiarity and lock-in due to dependence on the

Microsoft file formats (Miller, 2006; Matzan, 2005; Dolinar, 2008; OpenOffice.org,

2008b). It is reasonable to believe that users who are less involved with Microsoft Office

would be impacted to a lesser degree by these switching barriers, and hence would be

more likely to seriously consider switching office suites. Wakefield & Blodgett (1999) argued that the more users work with their current product, the more they understand it become comfortable with it, and identify with it. The users get involved in the community that surrounds the product, and find more and more needs that they can fulfill with the product, making the move to a product less appealing. This theory leads to hypothesis 10:

H10: Users' involvement with Microsoft Office is significantly and negatively correlated to the likelihood they have seriously considered switching office suites

3.1.11 Hypothesis 11 – Dissatisfaction

Colgate and Lang (2001) noted in their study that there was a significant and positive correlation between the level of dissatisfaction of a customer and the likelihood they had seriously considered switching companies. It is unclear if user dissatisfaction has an effect on whether or not users seriously considering switching office suites. Several authors have described switching motivators that relate to problems or difficulties users may have experienced with Microsoft Office (Ridling, 2007; OpenOffice.org, 2008b; Ciurana, 2004; Farnum, 2006). They suggest that OpenOffice.org provides relief to the problems users have experienced. In contrast, if users were satisfied with Microsoft Office, they would have no motivation to switch, and would be less likely to seek out alternative products (Athanassopoulos, 2001). Authors in the open source literature have reported that one of the prominent motivations of companies to participate in open source

software development is to improve customer satisfaction (Hohensohn & Hang, 2003; Andersson, et al., 2005). It is reasonable to believe that users that are dissatisfied with Microsoft Office would be more likely to seriously consider switching office suites. This theory leads to hypothesis 11:

H11: Users' dissatisfaction with Microsoft Office is significantly and positively correlated to the likelihood they have seriously considered switching office suites

3.1.12   Hypothesis 12 – Tendency to search for information about alternatives

Colgate and Lang (2001) also noted in their study that there was a significant and positive correlation between the tendency of customers to actively search for information about alternatives and the likelihood they had seriously considered switching companies. It is unclear if this relation holds in the case of whether or not users seriously considering switching office suites. OpenOffice.org (2008b) has recognized that disseminating information about its product to potential users is an area that requires improvement. They have made it a key goal in their marketing plan. Open sourcing a product has been used as a strategy to hasten user adoption by maximizing the ease of distribution (Dahlander, 2004). By allowing the product to be freely available, users are more likely to find out about it as a potential alternative. Colgate and Lang (2001) reported that customers who had seriously considered switching companies collected material to compare prices and information about the competition. Many of them also asked friends, family and other acquaintances for advice about alternatives. The open source viral

marketing model matches well with this means of information dissemination (OpenOffice.org, 2008b). Further, open sourcing a product can be an effective strategy to increase brand value (Andersson, et al., 2005). The stronger the brand of an alternative product, the more likely a user will be aware of it, and seek information about it. It is likely that users who have seriously considered switching office suites have actively searched for information about alternatives by collecting information and asking advice from contacts. This theory leads to hypothesis 12:

H12: Users' likelihood to have actively searched for information about alternatives to Microsoft Office is significantly and positively correlated to the likelihood they have seriously considered switching office suites

3.1.13   Summary of hypotheses on user characteristics

Table 11 shows each user characteristic described in hypotheses 5 through 12, and summarizes the theorized correlation between the characteristic and whether or not the respondent had seriously considered switching office suites. A plus sign indicates that it is hypothesized that the characteristic is significantly and positively correlated with seriously considering switching office suites. A minus sign indicates that it is hypothesized that the characteristic is significantly and negatively correlated with seriously considering switching office suites.

Characteristic	Hypothesis	Direction
Users' ethical considerations related to software piracy	H5	+

Characteristic	Hypothesis	Direction
Users' social class	H6	-
Users' innovativeness	H7	+
Users' loyalty to Microsoft	H8	-
Users' level of cultural identification with the open source movement	H9	+
Users' product involvement with Microsoft Office	H10	-
Users' dissatisfaction with Microsoft Office	H11	+
Users' tendency to search for information about alternatives to Microsoft Office	H12	+

Table 11: User characteristics and impact on likelihood to have seriously considered switching office suites

3.2   Survey design

This section describes the survey design. A questionnaire-based survey design was selected that questioned respondents about the switching barriers between Microsoft Office and OpenOffice.org. The questionnaire was distributed to respondents in paper form and online. The cover page was a letter explaining the purpose of the survey, the privacy and ethical concerns related to the survey, and contact information for the researcher. Instructions on how to fill out the questionnaire were presented following the title page.

The following parts describe the survey controls and operationalizations used in this research.

3.2.1   Unit of analysis and measurement scale

The unit of analysis is a user of Microsoft Office. The measurement scale is a 7-point

Likert scale that quantifies answers to questions about a respondent's level of agreement with statements related to the switching barriers between Microsoft Office and OpenOffice.org. The scale range is from 1 to 7, where 1 indicates "completely disagree", and 7 indicates "completely agree". The median of the scale is 4, which indicates "neither agree or disagree". Multiple choice questions that determined the demographic, situational, and attitudinal factors of the respondents were also analyzed to classify respondents. The additional choice of "N/A" (no answer) was included for all questions.

3.2.2   Period of analysis

This thesis analyzes the answers of respondents at the time they completed the questionnaires. The questionnaires were completed between November 24, 2008 and December 19, 2008.

3.2.3   Population, operational definitions and sample selection

The target population is users of Microsoft Office who have seriously considered switching to OpenOffice.org. For the purpose of this research, the operational definition of "user of Microsoft Office" is someone who reports that they use any version of Microsoft Office as their primary office suite. The term "primary" is defined as used for tasks typically completed with office suite software more than 50% of the time. The term "office suite software" is defined as a package of software that is typically installed on desktop computers for the purpose of accomplishing a specific tasks, such as word processing, spreadsheet processing, presentation design, multimedia design, and other

tasks that are typically completed by knowledge workers.

The sample was selected from two sources; via distribution of a paper questionnaire to graduate students of Carleton University, in Ottawa, Ontario, Canada; and, via publication of an online questionnaire. An invitation to participate in the study was emailed to the researcher's personal contacts and posted in online forums that were known to the researcher. Participants were encouraged to invite additional participants to fill out the questionnaire. The demographics of the resultant sample showed a reasonable diversity in terms of age, gender, level of education, and total household income.

The sample was further restricted to respondents who reported that at the time they completed the questionnaire, they were using Microsoft Office as their primary office suite. The sample was then split into users who report having considered switching to OpenOffice.org at any point in the past, and those who had not considered switching to OpenOffice.org. This split of respondents enabled the testing of the hypotheses related to user characteristics. This sample was selected as it offered a broad diversity of ethnic backgrounds, income levels, and levels of technical familiarity.

3.2.4   Response rate, sample demographics, and sample breakdown

259 questionnaires were completed, of which 240 were usable after imputation. Table 12 shows the gender distribution of the sample.

Group	Count	Percentage
Male	145	60.42%
Female	70	29.17%
Prefer to not answer	25	10.42%

Table 12: Gender distribution of sample

Table 13 shows the distribution of the level of education of the sample.

Group	Count	Percentage
Have not completed high school (11 years of education or less)	1	0.42%
Completed high school (12-13 years of education)	9	3.75%
Completed 1-2 years of Undergraduate studies (14-15 years of education)	29	12.08%
Completed 3-4 years of Undergraduate studies (16-17 years of education)	65	27.08%
Completed 1-2 years of Graduate studies (18-19 years of education)	56	23.33%
Completed 3 or 4+ years of Graduate studies (20-22 years of education)	26	10.83%
Post Graduate studies (23 years of education or more)	28	11.67%
Prefer to not answer	26	10.83%

Table 13: Distribution of level education of sample

Table 14 shows the distribution of the age of the sample.

Group	Count	Percentage
18 - 21	11	4.58%
22 - 25	40	16.67%
26 - 30	66	27.50%
31 - 40	43	17.92%
41 - 50	25	10.42%
51 - 60	24	10.00%
61 and over	3	1.25%
Prefer to not answer	28	11.67%

Table 14: Distribution of age of sample

Table 15 shows the distribution of the amount of the sample's total household income

before taxes.

Group	Count	Percentage
$0 - $14,999	9	3.75%
$15,000 - $19,999	8	3.33%
$20,000 - $29,999	21	8.75%
$30,000 - $39,999	7	2.92%
$40,000 - $59,999	25	10.42%
$60,000 - $84,999	41	17.08%
Over $85,000	70	29.17%
Prefer to not answer	59	24.58%

Table 15: Distribution of total household income of sample

Table 16 shows the breakdown of respondents according to usage of Microsoft Office as their primary office suite.

Group	Count	Percentage
Use Microsoft Office as primary office suite	202	84.17%
Do not user Microsoft Office as primary office suite	38	15.83%

Table 16: Usage of Microsoft Office as primary office suite

Table 17 shows the breakdown of respondents who indicated that they use Microsoft Office as their primary office suite according to whether or not they had considered switching to OpenOffice.org.

Group	Count	Percentage
Have considered switching to OpenOffice.org	101	50.00%
Have not considered switching to OpenOffice.org	101	50.00%

Table 17: Switching consideration amongst users of Microsoft Office

3.2.5 Measurements

The objective of this thesis was to identify the switching barriers between Microsoft Office and OpenOffice.org. Respondents were first asked if they used Microsoft Office as their primary office suite. If they responded no, they were directed to skip to the demographic section of the questionnaire. If they responded yes, they were next asked if they had considered switching to OpenOffice.org at any point. This question and its wording enabled the identification of the target sample of "considered switchers" to answer the thesis' research questions on the effects of user characteristics. This delineation of "considered switchers" also avoids behavioural intention issues in the responses in the questionnaire. As the sample has already considered switching, it is not a reflection of what they plan to do in the future, but rather a reflection of past behaviour. This control helped improve results as past research has shown that questions about what a respondent plans to do in the future may not afford answers that correlate well with what the respondent actually ends up doing.

The respondents were then asked questions that assessed what their switching barriers were. The questions were derived from the literature review and contained questions related to relationship investment, negativity, apathy, service recovery. These questions included questions about product specific features of Microsoft Office and OpenOffice.org that may have impacted their decision making process. Respondents were also asked questions that measured their characteristics, including innovativeness, ethical perceptions towards open source, social class, cultural values related to open

source, loyalty to Microsoft, level of involvement with Microsoft Office, satisfaction with Microsoft Office, and how much information, and from what sources, they had sought about alternatives. The questionnaire concluded with demographic questions, including age, gender, and education. The questions were designed to test the hypotheses related to the thesis' objectives. The full questionnaire is reproduced in Appendix 1.

3.3   Questionnaire design

This section describes the creation of the questionnaire. The questions were specifically designed to test the hypotheses of this thesis. Where hypotheses could be tested directly through single measures, statements were included for respondents to evaluate. Some of the hypotheses were tested through a combination of measures, and did not require their own evaluative statements in the questionnaire.

3.3.1   Hypotheses 1 through 4

Hypotheses 1 through 4, and their respective sub-hypotheses all seek to assess respondent perceptions on potential switching barriers between Microsoft Office and OpenOffice.org. To that end, respondents were presented with affirmative-phrasing statements, and they were asked to rate, from 1 to 7, where 1 indicated "completely disagree", and 7 indicated "completely agree", their level of agreement with the statements. The median answer of 4 indicates "neither agree or disagree". Each statement contained the salient content of each hypothesis. The statements were all phrased in first person format to help the respondent better identify with them. Table 18

shows the statements presented to respondents and the associated hypotheses they were each respectively created to test. Each statement implies that it begins with the phrase "I have not switched from Microsoft Office to OpenOffice.org because...". The respondent was then asked to rank how much each statement reflects their reasoning.

Question	Hypothesis
I am comfortable with Microsoft	H1-A
I would not be accepted into the OpenOffice.org culture	H1-B
Microsoft offers discounted versions of Microsoft Office	H1-C
I was told to not switch from Microsoft Office to OpenOffice.org	H1-D
I do not believe in the principles of the open source movement	H1-E
OpenOffice.org does not meet my language or localization needs	H1-F
I have no interest in building or maintaining an open source community	H1-G
Microsoft better understands mv needs	H1-I
Microsoft Office is the best deal overall	H1-J
OpenOffice.org has fewer features or capabilities	H2-A
OpenOffice.org has compatibility problems	H2-B
There is no training or reference material for OpenOffice.org	H2-C
I am used to the Microsoft Office interface	H2-D
OpenOffice.org is slower	H2-E
OpenOffice.org has worse security	H2-F
OpenOffice.org has worse spell-checking tools	H2-G
OpenOffice.org is less flexible	H2-H
My productivity will decrease by switching to OpenOffice.org	H2-I
OpenOffice.org is less modular	H2-J
I am dependent on Microsoft Office file formats	H2-K
I am concerned about OpenOffice.org's open source license	H2-L
OpenOffice.org has fewer support options	H2-M
I do not know where to get OpenOffice.org	H2-N
OpenOffice.org creates larger files	H2-O
OpenOffice.org is not available for my operating system or computer	H2-P
OpenOffice.org is more difficult to customize	H2-Q
OpenOffice.org has harassing anti-piracy features	H2-R

Question	Hypothesis
OpenOffice.org is harder to learn and use	H2-S
OpenOffice.org takes longer to install	H2-T
OpenOffice.org causes legal problems with pirated software	H2-U
OpenOffice.org creates problems with audits and compliance verification	H2-V
OpenOffice.org is lower quality software	H2-W
OpenOffice.org does not have development toolkits readily available	H2-X
I am uncomfortable that anyone can inspect OpenOffice.org's code	H2-Y
OpenOffice.org is less stable	H2-Z
I am concerned about the negative outcomes of switching	H2-AA
I am uncertain of what the outcome of switching office suites would be	H2-BB
I do not like change	H3-A
There is no point in switching office suites	H3-B
OpenOffice.org did not come pre-installed on a new computer	H3-C
I was not planning on upgrading to a newer office suite	H3-D
All office suites are the same	H3-E
It is too much bother to switch office suites	H3-F
Microsoft successfully resolved a complaint I had with Microsoft Office	H4

Table 18: Statements to measure product-specific switching barriers

Sub-hypothesis H1-H, namely that users are overserved by Microsoft Office was tested by a combination of statements that collectively represent the concept of being overserved by a product. These statements were derived from Christensen's (1997) work on disruptive innovation, which was the motivating factor for OpenOffice.org (2008b) to include this switching barrier in their marketing report. Table 19 shows the statements used to assess test whether or not respondents are overserved by Microsoft Office.

Statements	Aspect
Microsoft Office is too expensive	Value for money
Microsoft Office is too complex	Complexity
I use all the features in Microsoft Office	Feature value

Statements	Aspect
I am willing to pay more for additional features and improvements on existing features in Microsoft Office	Price premium for innovation

Table 19: Statements to measure if users are overserved by Microsoft Office

Hypotheses 5 through 12 all seek to assess the impact of user characteristics on their likelihood to have seriously considered switching office suites. Statements were presented to the respondents that, collectively, measured a particular characteristic of the respondents. The following parts describe the user characteristics and the statements that were selected to measure them.

3.3.2 Ethical considerations related to software piracy

The measures for ethical considerations related to software piracy were derived from the study by Tan (2002). Tan categorized the dimensions of ethical considerations into three categories, namely moral intensity, including magnitude of consequences, probability of effect, and social consensus; perceived risks, including financial risk, performance risk, prosecution risk, and social risk; and, moral judgement, including cognitive judgement, and moral reasoning. As in the previous section, respondents were asked to rate their level of agreement with each statement.

Table 20 shows the statements used to assess the three aspects of the dimension of moral intensity, adapted from the questionnaire in Tan's study.

Statements	Aspect
Pirating software has a strong impact overall on the income of software programmers	Magnitude of consequences
My use of pirated software would directly cause a loss of income to the software programmer	Probability of effect
My friends, relatives, or associates regard pirated software as unethical	Social consensus

Table 20: Statements to measure moral intensity dimension of user ethical considerations

Table 21 shows the statements used to assess the four aspects of the dimension of

perceived risks, adapted from the questionnaire in Tan's study.

Statements	Aspect
Pirated software offers better value overall	Financial risk
Pirated software works as well as original software	Performance risk
It is unlikely that I would be caught if I were to pirate software	Prosecution risk
I would lose the respect of my friends, relatives, or associates if I were to pirate software	Social risk

Table 21: Statements to measure perceived risks dimension of ethical considerations

Table 22 shows the statements used to assess the two aspects of the dimension of moral

judgement, adapted from the questionnaire in Tan's study.

Statements	Aspect
In my opinion, it is morally wrong to pirate software	Cognitive judgement
One should always consider the possible moral implications before deciding whether or not to pirate software	Moral reasoning

Table 22: Statements to measure moral judgement dimension of user ethical

considerations

3.3.3 Social classification

Social class is defined as "the hierarchical division of society into relatively permanent

and homogeneous groups with respect to attitudes, values, and lifestyles" (Giacobbe,

2008). Williams (2002) measured social class through the computerized status index

(CSI). The CSI was appropriate for his study as it separates the data into individual

responses for comparative research done on married couples. For this study, the sample

will likely not have much diversity in terms of the factors that are typically associated

with social class, such as occupation, as the sample will be largely students; and,

education, as a large portion of the sample will consist of students who are part way

through their studies. The only social class factor that will have reasonable diversity in

the sample is household income. This measure was selected to represent social class in

this study. Research has shown that this measure alone is often as predictive as other

social class indexes (Giacobbe, 2008).

The household income brackets were adapted from those used by Williams (2002). They

were presented to respondents as a multiple choice question. Respondents were asked to

select the category that best matched their total annual household income before taxes.

The income levels were separated as seen in table 23.

Income level ranges
$0 – $14,999
$15,000 – $19,999
$20,000 – $29,999
$30,000 - $39,999
$40,000 - $59,999
$60,000 - $84,999
$85,000 and up

Table 23: Annual household income levels

3.3.4 Innovativeness

Consumer innovativeness is the tendency to willingly embrace change and try new things and adopt new products more often and more quickly than others (Hirunyawipada & Paswan, 2006). Hirunyawipada and Paswan (2006) used a multilevel model of personality traits to quantify innovativeness, including sensory, cognitive and domain specific innovativeness. This approach was used in their research as it reflects the effects of a particular combination of traits, as opposed to single measures to increase reliability.

For the present research, Goldsmith and Hofacker's (1991) domain innovativeness scale was selected as an appropriate measure of user innovativeness. While sensory innovativeness and cognitive innovativeness scales have been shown to have an effect on consumer behaviour (Venkatraman & Price, 1990), in the case of software, it is reasonable to assume that innovativeness related to software and technology will likely play the largest role. Respondents were asked to rate their level of agreement with each statement. Table 24 shows the statements as presented to the respondents as adapted

from Goldsmith and Hofacker (1991).

Statements
In general, I am among the last in my circle of friends to acquire new software after it becomes available
If I heard that new software was available, I would probably not be interested enough to try it
Compared to my friends, I have few software products
In general, I am the first in my circle of friends to know the names of the latest software
I will acquire new software even if I haven't tried it yet
In general, I do not know the names of new software companies before other people do

Table 24: Statements to measure user innovativeness

3.3.5 Loyalty to Microsoft

Customer loyalty is the strength of the relationship between an individual's relative attitude towards an entity, such as brand, service, store, or vendor, and repeat patronage. It can be expressed as an attitude that sometimes leads to a relationship with a relationship to a brand. It can be expressed in terms of revealed behaviour, such as a pattern of past purchases. It can also be expressed in the form of the moderation of an individual's purchasing based on their attitudes towards the product or company (Donio, et al., 2006). In their study of the impact of customer loyalty on purchasing behaviour, Donio, et al. (2006) adapted a loyalty measurement scale from extensive measures previously reported in the literature. Their measure was selected for this study as it strikes an appropriate balance of the various dimensions of loyalty that have been reported in the literature and encompasses them into a single measure. Respondents were asked to rate their level of agreement with each statement. Table 25 shows the statements as presented to the respondents as adapted from Donio, et al. (2006).

Statements
As a consumer of Microsoft products, I am willing to put in extra effort to buy products from this company
As long as the product is similar, I could just as well be buying from a different company
I am proud to tell others that I buy products from Microsoft. I would recommend Microsoft to others.
For me, Microsoft is the best alternative
I expect to stay with Microsoft for a long period of time
As a consumer of Microsoft products, I feel that I am prepared to pay more for higher quality products
I feel very little loyalty to Microsoft

Table 25: Statements to measure user loyalty to Microsoft

3.3.6 Cultural identification with open source movement

Oetting (1993) defines cultural identification as "a persistent, long-term, underlying characteristic that organizes cognitions, emotions, and behaviours, where those with high identification with a culture perceive themselves as adapted or adjusted to that culture. They see themselves as involved in the culture and as capable and competent within it. The person with high cultural identification is more likely to see events from the perspective of that culture, will make evaluative judgements about people and events that are based on cultural beliefs and values, will choose behaviours that are culturally congruent, and, will be successful in cultural activities". For this study, a simplistic scale for the measurement of cultural identification was selected to balance feasibility, specificity, and reliability, as research has shown that cultural identification can be assessed using only a few items, and the results can still be highly useful (Oetting & Beauvais, 1990-1991). Oetting & Beauvais (1990-1991) suggest that with surveys of adults, only two basic items are needed to assess identification with any one culture to a reasonable degree, with a reliability of at least .70. They state that this method is

appropriate when inclusion of a large number of items would be impractical.

Respondents were asked to rate their level of agreement with each statement. Table 26

shows the statements as presented to the respondents, as adapted from Oetting &

Beauvais (1990-1991).

Statements
I believe in the values of the open source community's culture
I am successful at supporting the values of the open source community's culture in my life

Table 26: Statements to measure user cultural identification with open source community

3.3.7   Product involvement with Microsoft Office

Product involvement is defined as the personal relevance of a product to a user based on

the inherent needs, values and interests of the user (Xue, 2008). Product involvement is

an abstract moderating variable that cannot be measured directly. It can be evaluated

indirectly via a semantic differential model using an inventory (Lin, 2006). In both of

their studies, Xue (2008) and Lin (2006) adopted the ten item personal involvement

inventory developed by Zaichkowsky (1985), and later refined (Zaichkowsky, 1994) to

measure product involvement. This measure was selected for this study to measure a

user's product involvement with Microsoft Office as it has been thoroughly examined in

the literature for reliability and validity with an internal reliability of over .90

(Zaichkowsky, 1994). Respondents were asked to rate their level of agreement with each

statement. Table 27 shows the statements as presented to the respondents, as adapted

from Zaichkowsky (1994).

Statements
Microsoft Office is important to me
Microsoft Office is boring
Microsoft Office is relevant
Microsoft Office is exciting
Microsoft Office means nothing to me
Microsoft Office is appealing
Microsoft Office is fascinating
Microsoft Office is worthless
Microsoft Office is involving
Microsoft Office is not needed

Table 27: Statements to measure user product involvement with Microsoft Office

3.3.8 Dissatisfaction with Microsoft Office

Satisfaction is defined as the the difference between user expectations for the performance, features, reliability, and characteristics of a product, and its actual performance, features, reliability and characteristics as experienced by the user (Athanassopoulos, 2001). Satisfaction occurs when the net user experience outcome is positive, and dissatisfaction occurs when the net user experience outcome is negative. Colgate and Lang (2001) reported a correlation between dissatisfaction of a customer and the likelihood they had seriously considered switching companies. They measured customer dissatisfaction with a single question. This measure was selected for this study as it is an appropriate parallel to the work of Colgate and Lang (2001), with the dependent variable being likelihood to seriously consider switching office suites. Respondents were asked to rate their level of agreement with the statement. Table 28 shows the statement as presented to the respondents, as adapted from Colgate and Lang

(2001).

Statement
Overall, I am dissatisfied with Microsoft Office

Table 28: Statements to measure overall user dissatisfaction with Microsoft Office

3.3.9 Tendency to search for information about alternatives to Microsoft Office

Colgate and Lang (2001) found that there was a correlation between customers' active search for information about alternatives and the likelihood to have seriously considered switching. The information acquired from the customers' searches lead to more knowledge about the alternatives, which lead to increased purchase intention towards the alternatives, reflected in the increased likelihood to have seriously considered switching. They measured tendency to search for information about alternatives with two questions. The two question measure was selected for this study as it is an appropriate parallel to the work of Colgate and Lang (2001), with the dependent variable being likelihood to seriously consider switching office suites. Respondents were asked to rate their level of agreement with the statements. Table 29 shows the statements as presented to the respondents, as adapted from Colgate and Lang (2001).

Statements
I have researched material to compare information about alternatives to Microsoft Office
I have asked friends, family, or acquaintances for advice about alternatives to Microsoft Office

Table 29: Statements to measure user tendency to search for information about

alternatives to Microsoft Office

3.4   Questionnaire pre-test

The questionnaire was pre-tested on a small group of about ten respondents to assess comprehension, and identify any confusing or misleading questions. The overall results of the pre-test were encouraging. Respondents indicated some confusion with the phrasing of a few questions. The phrasing in the questions was adjusted where possible to increase user comprehension without changing the format of the measures, or eliminating content that was salient to the hypotheses being tested. Respondents also indicated some confusion with the meanings of the questions related to product involvement. They found the questions vague. Researchers who have examined this measure's validity report that it has its strongest validity in the format used in this questionnaire (Zaichkowsky, 1994). As such, the questions related to product involvement were not modified from the prescribed format in the literature.

3.5   Data collection and analysis

Questionnaires were administered both online and in paper form. With the online version, answers were directly submitted to the database automatically. With the paper version, the answers were transcribed to the database by the researcher. Each anonymous respondent was assigned a number to track their responses more easily. Random sampling verification was done on the database after data entry to ensure no transcription errors occurred.

Statistical controls and analysis techniques were used to make the data manageable and to

interpret them more clearly. The analysis was split into two parts. The first part analyzed the data from respondents who reported that they currently use Microsoft Office as their primary office suite and who also reported having considered switching office suites in the past, i.e. the "considered switchers". Descriptive statistics were calculated for all responses in that part, including mean, and standard deviation. A single-sample Student's t test for significance was used to establish the confidence interval around the observed mean response. The null hypothesis was a mean response of 4.0, indicating that respondents "neither agreed or disagreed" with the relevance of the measure in their switching decision. The variables that were identified as significant switching barriers were isolated. The Kaiser-Meyer-Olkin (KMO) statistic was calculated to determine the suitability of factor analysis for the variables. Correlation analysis was conducted to identify the relationship between the variables.

The second part of the analysis compared the data from respondents who reported that they currently use Microsoft Office as their primary office suite and that they had never considered switching office suites against the data from the "considered switchers". Each of the scales selected to assess the users' personal characteristics were calculated for both classes of respondents and the means were compared using the Welch Two Sample Student's t test for significance of variance. The null hypothesis was no variance between means between the groups of respondents. The variances of the responses were not assumed to be equal between groups.

4 Results

This section details the aggregate responses to the questionnaire. First, it begins with a tabulation of the descriptive statistics, and the results of the single-sample Student's t test for significance of responses relating to hypotheses 1 through 4, from respondents who report using Microsoft Office as their primary office suite, and having considered switching to OpenOffice.org, i.e. "considered switchers". Second, the results are compared to the hypotheses to identify the significant product-specific switching barriers. Third, the KMO statistic and correlation analysis are presented. Fourth, a tabulation of the descriptive statistics, and the results of the Welch Two Sample Student's t test for significance of variance of responses between "considered switchers" and Microsoft Office users who are not "considered switchers" relating to hypotheses 5 through 12 is presented. Fifth, the results are compared to the hypotheses to identify the significant user-specific switching barriers.

4.1   Descriptive statistics of responses relating to hypotheses 1 through 4

Table 30 shows the descriptive statistics for the responses to each question in the questionnaire. Due to the large number of responses (>100), and the use of a two-tailed Student's t test, a P of < .05 was considered significant. The null hypothesis was a mean response of 4.0.

H	Mean	stdev	t	df	0%	25%	50%	75%	100%	P	P < .05 ?
H1A	5.470000	1.641969	8.9527	99	1	4	6	7	7	2.10e-14	Y
H1B	2.210526	1.536054	11.3548	94	1	1	2	4	7	<2.2e-16	Y
H1C	3.725275	2.092664	-1.2523	90	1	2	4	5.5	7	0.2137	N
H1D	1.785714	1.364121	-16.0692	97	1	1	1	2	7	<2.2e-16	Y
H1E	1.485149	1.091914	-23.1465	100	1	1	1	1	6	<2.2e-16	Y
H1F	1.816327	1.303025	-16.5901	97	1	1	1	2	6	<2.2e-16	Y
H1G	3.010101	2.057812	-4.7863	98	1	1	2	4.5	7	6.013e-06	Y
H1H_1	5.965909	1.670906	11.037	87	1	5.75	7	7	7	<2.2e-16	Y
H1H_2	3.269663	1.893554	-3.6387	88	1	2	3	5	7	0.0004616	Y
H1H_3	3.179775	1.849827	-4.1831	88	1	1	3	5	7	6.783e-05	Y
H1H_4	2.500000	1.681543	-8.3681	87	1	1	2	4	7	8.81e-13	Y
H1I	2.949495	1.649822	-6.3355	98	1	1	3	4	7	7.216e-09	Y
H1J	2.702970	1.688458	-7.7201	100	1	1	2	4	7	9.043e-12	Y
H2A	3.937500	1.672140	-0.3662	95	1	2	4	5	7	0.715	N
H2B	4.031579	1.975664	0.1558	94	1	2	4	5	7	0.8765	N
H2C	3.021053	1.610992	-5.9228	94	1	2	3	4	7	5.157e-08	Y
H2D	5.430000	1.965639	7.275	99	1	5	6	7	7	8.27e-11	Y
H2E	3.455556	1.749228	-2.9528	89	1	2	4	4	7	0.004027	Y
H2F	3.048193	1.360628	-6.3731	82	1	2	4	4	6	1.023e-08	Y
H2G	3.036145	1.485259	-5.9122	82	1	2	3	4	7	7.453e-08	Y
H2H	3.164835	1.648324	-4.8334	90	1	2	3	4	7	5.495e-06	Y
H2I	3.510417	1.841023	-2.6056	95	1	2	4	5	7	0.01065	Y
H2J	3.155844	1.328483	-5.5759	76	1	2	4	4	6	3.601e-07	Y
H2K	5.265957	1.711288	7.1723	93	1	5	6	7	7	1.744e-10	Y
H2L	1.919540	1.357309	-14.2968	86	1	1	1	2.5	7	<2.2e-16	Y
H2M	3.024096	1.696308	-5.2413	82	1	1	3	4	6	1.215e-06	Y
H2N	1.489362	1.267838	19.1993	93	1	1	1	1	7	<2.2e-16	Y
H2O	2.876543	1.354462	-7.465	80	1	2	3	4	6	8.954e-11	Y
H2P	1.560440	1.275485	-18.2455	90	1	1	1	1	7	<2.2e-16	Y
H2Q	2.858824	1.604702	-6.5564	84	1	1	3	4	7	4.229e-09	Y
H2R	2.462500	1.475056	-9.3229	79	1	1	2	4	6	2.280e-14	Y
H2S	3.011364	1.593769	-5.8191	87	1	1	3	4	6	9.661e-08	Y
H2T	2.694118	1.654888	-7.2752	84	1	1	2	4	7	1.676e-10	Y
H2U	2.197674	1.437480	-11.6274	85	1	1	1	4	6	<2.2e-16	Y
H2V	3.000000	1.615893	-5.2875	72	1	1	4	4	7	1.274e-06	Y

H	Mean	stdev	t	df	0%	25%	50%	75%	100%	P	P < .05 ?
H2W	2.988636	1.751809	-5.4158	87	1	1	3	4	7	5.346e-07	Y
H2X	2.783784	1.473699	-7.0993	73	1	1	3	4	6	6.814e-10	Y
H2Y	2.112360	1.674937	-10.632	88	1	1	1	3	7	<2.2e-16	Y
H2Z	2.976744	1.721673	-5.5117	85	1	1	3	4	7	3.739e-07	Y
H2AA	3.956044	2.164933	-0.1937	90	1	2	4	6	7	0.8469	N
H2BB	3.802198	2.028792	-0.9301	90	1	2	4	5	7	0.3548	N
H3A	3.344444	2.050821	-3.0325	89	1	1	3	5	7	0.003177	Y
H3B	3.808989	2.136673	-0.8434	88	1	1	4	6	7	0.4013	N
H3C	4.352941	2.433427	1.3372	84	1	1	5	7	7	0.1848	N
H3D	4.232558	2.123673	1.0155	85	1	3	4	6	7	0.3127	N
H3E	2.921348	1.765996	-5.7622	88	1	1	3	4	7	1.203e-07	Y
H3F	4.134831	2.206349	0.5765	88	1	2	5	6	7	0.5657	N
H4	2.500000	1.781048	-6.6315	61	1	1	1.5	4	7	9.92e-09	Y

Table 30: Descriptive statistics of responses to questions on product specific factors

4.2   Product-specific switching barriers

Tables 31 through 34 enumerate the sub-hypotheses for H1-H3 and hypothesis H4, and

indicate whether or not they received support from the observed data. An 'X' denotes no

support from observed data, which is the case when the responses had a mean that did not

reach an acceptable level of significance. A 'P' denotes partial support from the observed

data, which is the case when the means of the responses were significantly different from

the null hypothesis, were between 3 and 5, in the direction predicted by the hypothesis.

An 'S' denotes strong support from the observed data, which is the case when the means

of the responses were significantly different from the null hypothesis, were between 1

and 3 or between 5 and 7, in the direction predicted by the hypothesis. An 'Op' or 'Os'

denotes responses that had a mean that was significantly different from the null

hypothesis, but in the opposite direction than that predicted by the hypothesis, with either

a partial or a strong level of support.

Suggested switching barriers	Hypothesis	Direction	Result	Barrier?
Comfortable with Microsoft	H1-A	+	S	Y
OpenOffice.org has an exclusivist culture associated with it	H1-B	+	Os	N
Microsoft offers discounted versions of Microsoft Office	H1-C	+	X	N
Users are told to not switch from Microsoft Office to OpenOffice.org	H1-D	+	Os	N
Users do not believe in the principles of the open source movement	H1-E	-	S	N
OpenOffice.org does not meet user language or localization needs	H1-F	-	S	N
User has no interest in building and maintaining an open source community	H1-G	+	Op	N
Users are not overserved by Microsoft Office	H1-H	-	P	N
Microsoft understands users' needs	H1-I	+	Os	N
Microsoft Office is the best deal overall	H1-J	+	Os	N

Table 31: H1 sub-hypotheses and observed results

Suggested switching barriers	Hypothesis	Direction	Result	Barrier?
OpenOffice.org has fewer features or capabilities	H2-A	+	X	N
OpenOffice.org has compatibility problems	H2-B	+	X	N
Lack of training or reference material for OpenOffice.org	H2-C	+	Op	N
Users are habituated to Microsoft Office interface	H2-D	+	S	Y
OpenOffice.org is slower	H2-E	+	Op	N
OpenOffice.org has worse security	H2-F	+	Op	N
OpenOffice.org has worse spell-checking tools	H2-G	+	Op	N
OpenOffice.org is less flexible	H2-H	+	Op	N
Users will suffer a decrease in productivity by switching to OpenOffice.org	H2-I	+	Op	N
OpenOffice.org is less modular	H2-J	+	Op	N
Users are dependent on Microsoft Office file formats	H2-K	+	S	Y
Users are concerned about OpenOffice.org's open source license	H2-L	+	Os	N

Suggested switching barriers	Hypothesis	Direction	Result	Barrier?
OpenOffice.org has fewer support options	H2-M	+	Op	N
Users are unfamiliar with the availability of OpenOffice.org	H2-N	+	Os	N
OpenOffice.org has a larger file size	H2-O	+	Os	N
OpenOffice.org is not available on user's platform	H2-P	-	S	N
OpenOffice.org is more difficult to customize	H2-Q	+	Os	N
OpenOffice.org has harassing anti-piracy features	H2-R	-	S	N
OpenOffice.org is harder to learn and use	H2-S	+	Op	N
OpenOffice.org takes longer to install and test	H2-T	-	S	N
OpenOffice.org is a legal risk	H2-U	-	S	N
OpenOffice.org creates problems with audits and compliance verification	H2-V	-	S	N
OpenOffice.org is lower quality software	H2-W	+	Os	N
OpenOffice.org does not have development toolkits readily available	H2-X	-	S	N
Anyone can inspect OpenOffice.org's code	H2-Y	-	S	N
OpenOffice.org is less stable	H2-Z	+	Os	N
Users are concerned about the negative outcomes of switching	H2-AA	+	X	N
Users are uncertain of the outcome of changing office suites	H2-BB	+	X	N

Table 32: H2 sub-hypotheses and observed results

Suggested switching barriers	Hypothesis	Direction	Result	Barrier?
Users are resistant to change	H3-A	+	Op	N
Users are indifferent	H3-B	+	X	N
OpenOffice.org is not pre-installed on new computers	H3-C	+	X	N
User was not planning on upgrading to newer office suite	H3-D	+	X	N
Users feel all office suites are the same	H3-E	+	Os	N
Users feel it is too much bother to switch	H3-F	+	X	N

Table 33: H3 sub-hypotheses and observed results

Suggested switching barriers	Hypothesis	Direction	Result	Barrier?
Microsoft successfully resolved a complaint I had with Microsoft Office	H4	-	S	N

Table 34: H4 hypothesis and observed results

4.3   KMO statistic and correlation analysis

Of the 45 variables tested in hypotheses 1 through 4, only 3 variables were revealed to be

significant switching barriers, namely H1-A, H2-D, and H2-K. Three variables are

insufficient for significant exploratory factor analysis. The KMO statistic for the three

variables was 0.5715941, described as a miserable, or unacceptable degree of common

variance, and indicating a poor suitability to factor analysis (Pett, Lackey, & Sullivan,

2003).

Table 35 shows the correlation analysis for the variables.

	H1-A	H2-D	H2-K
H1-A	1.0000000	0.6137172	0.2529470
H2-D	0.6137172	1.0000000	0.2514983
H2-K	0.2529470	0.2514983	1.0000000

Table 35: Correlation analysis of switching barriers

The correlation analysis indicates a moderate strength of relationship between variables

H1-A and H2D, and a low strength of relationship between variable H2-K and the other

two (Pett, Lackey, & Sullivan, 2003).

4.4   Measurement scales of respondent characteristics relating to hypotheses 5 through

12

This section describes the results of the measurement scales to evaluate the characteristics

of respondents. Tables 37 through 43 show the descriptive statistics of the responses to

questions related to hypotheses 5 through 12, comparing respondents who report having

considered switching to OpenOffice.org with those respondents who report not having

considered switching to OpenOffice.org.

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H5_1	4.525253	1.5671594	4.505747	1.8731491	0.0764	168.419	0.9392	N
H5_2	4.385417	1.9701445	3.835294	1.9508671	1.8846	176.757	0.06112	N
H5_3	3.929293	1.7742634	4.057471	1.8131068	-0.4859	179.867	0.6276	N
H5_4	3.690722	1.9651168	3.741176	1.9648879	-0.1728	176.881	0.863	N
H5_5	4.237113	1.7781849	4.662791	1.7463270	-1.6317	179.098	0.1045	N
H5_6	4.489796	1.9648714	5.275862	1.5971607	-2.9987	181.636	0.003092	Y
H5_7	2.800000	1.8531982	2.977011	1.8234711	-0.6571	182.199	0.5119	N
H5_8	4.653061	1.9163003	4.701149	1.7528378	-0.1782	182.829	0.8587	N
H5_9	5.112245	1.7343269	5.137931	1.6993324	-0.1016	181.209	0.9192	N

Table 36: Comparison of descriptive statistics of responses to questions on the ethical

considerations of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H6	5.536585	1.7298763	5.323944	1.8029709	0.7413	145.937	0.4597	N

Table 37: Comparison of descriptive statistics of responses to question on the social class

of respondent

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H7_1	4.000000	2.0743747	3.240964	1.9480469	2.5478	178.224	0.01168	Y
H7_2	4.140000	1.7408926	3.511628	1.9628562	2.2929	171.512	0.02307	Y
H7_3	3.979798	2.0651619	3.000000	1.8740851	3.3529	178.848	0.000976	Y
H7_4	3.800000	2.0694995	4.095238	2.0335680	-0.9731	177.563	0.3318	N
H7_5	3.090000	1.8591570	3.678161	1.9736300	-2.0881	177.924	0.03821	Y
H7_6	4.132653	2.0032847	3.416667	1.9151164	2.4614	177.842	0.01479	Y

Table 38: Comparison of descriptive statistics of responses to questions on the

innovativeness of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H8_1	3.183673	1.6267540	2.282353	1.3939646	4.0363	180.977	8.005e-05	Y
H8_2	4.907216	1.6960891	5.255814	1.8860856	-1.3081	172.202	0.1926	N
H8_3	3.652632	1.5626520	2.880952	1.5631661	3.2967	174.313	0.001186	Y
H8_4	4.081633	1.4118312	3.435294	1.7282461	2.7441	162.297	0.006751	Y
H8_5	4.701031	1.4445656	4.317647	1.7539871	1.596	163.111	0.1124	N
H8_6	3.649485	1.7080766	3.071429	1.6190561	2.335	177.521	0.02066	Y
H8_7	4.793814	1.8424290	5.470588	1.8230550	-2.4863	177.346	0.01383	Y

Table 39: Comparison of descriptive statistics of responses to questions on the loyalty to

Microsoft of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H9_1	5.728261	1.3017593	5.941176	1.4087561	-1.0418	170.731	0.299	N
H9_2	4.340909	1.5748480	4.303797	1.8282290	0.1398	154.903	0.889	N

Table 40: Comparison of descriptive statistics of responses to questions on the cultural

identification with the open source movement of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H10_1	4.762887	1.8471442	4.470588	1.7901066	1.0828	178.163	0.2804	N
H10_2	3.757895	1.3892887	3.819277	1.7260174	-0.2589	157.174	0.796	N
H10_3	5.500000	1.0954451	5.470588	1.1082830	0.1792	175.839	0.858	N
H10_4	3.536842	1.3112486	3.277108	1.4923647	1.2253	164.599	0.2222	N
H10_5	3.031579	1.4907704	3.024096	1.4977699	0.0333	172.589	0.9735	N
H10_6	4.336842	1.2850244	4.357143	1.4941078	-0.0968	164.822	0.923	N
H10_7	3.442105	1.3346112	3.200000	1.5491933	1.1169	166.852	0.2656	N
H10_8	2.389474	1.4752911	2.447059	1.5000467	-0.2591	175.108	0.7958	N
H10_9	4.106383	1.2483803	3.858824	1.4731966	1.2064	165.484	0.2294	N
H10_10	2.208333	1.1869170	2.464286	1.7106782	-1.1503	145.149	0.2519	N

Table 41: Comparison of descriptive statistics of responses to questions on the product

involvement with Microsoft Office of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H11	2.835052	1.2639259	2.848837	1.5302244	-0.0659	165.36	0.9475	N

Table 42: Comparison of descriptive statistics of responses to question on the overall

dissatisfaction with Microsoft Office of respondents

No.	Mean non-OO	stdev non-OO	Mean OO	stdev OO	t	df	P	P < .05?
H12_1	2.979167	1.8466423	4.658824	1.7765197	-6.2316	177.753	3.254e-09	Y
H12_2	2.800000	1.7959766	3.821429	2.0009679	-3.5753	168.063	0.0004569	Y

Table 43: Comparison of descriptive statistics of responses to questions on the tendency

to search for information about alternatives to Microsoft Office for

respondents

4.5   User-specific switching barriers

Tables 44 through 51 enumerate hypotheses 5 through 12, and indicate whether or not

they received support from the observed data. An 'X' denotes no support from the

observed data, which is the case when the variance of the means between groups did not

reach an acceptable level of significance. A 'P' denotes partial support from the observed

data, which is the case when the variance of the means between groups was significant,

and the means differed by less than one point in the direction predicted by the hypothesis.

An 'S' denotes strong support from the observed data, which is the case when the variance

of the means between groups was significant, and the means differed by more than one

point in the direction predicted by the hypothesis. An 'Op' or 'Os' denotes cases where the

variance in means between groups that was significant, but in the opposite direction than that predicted by the hypothesis, with either a partial or a strong level of support.

Statements	Aspect	Hypothesis	Direction	Result
Pirating software has a strong impact overall on the income of software programmers	Magnitude of consequences	H5_1	+	X
My use of pirated software would directly cause a loss of income to the software programmer	Probability of effect	H5_2	+	X
My friends, relatives, or associates regard pirated software as unethical	Social consensus	H5_3	+	X
Pirated software offers better value overall	Financial risk	H5_4	-	X
Pirated software works as well as original software	Performance risk	H5_5	-	X
It is unlikely that I would be caught if I were to pirate software	Prosecution risk	H5_6	-	Op
I would lose the respect of my friends, relatives, or associates if I were to pirate software	Social risk	H5_7	+	X
In my opinion, it is morally wrong to pirate software	Cognitive judgement	H5_8	+	X
One should always consider the possible moral implications before deciding whether or not to pirate software	Moral reasoning	H5_9	+	X

Table 44: H5 hypothesis and observed results

Measure	Aspect	Hypothesis	Direction	Result	Barrier?
Social class	Income level	H6	-	X	N

Table 45: H6 hypothesis and observed result

Statements	Hypothesis	Direction	Result
In general, I am among the last in my circle of friends to acquire new software after it becomes available	H7_1	-	P
If I heard that new software was available, I would probably not be interested enough to try it	H7_2	-	P
Compared to my friends, I have few software products	H7_3	-	P
In general, I am the first in my circle of friends to know the names of the latest software	H7_4	+	X
I will acquire new software even if I haven't tried it yet	H7_5	+	P
In general, I do not know the names of new software companies before other people do	H7_6	-	p

Table 46: H7 hypothesis and observed results

Statements	Hypothesis	Direction	Result
As a consumer of Microsoft products, I am willing to put in extra effort to buy products from this company	H8_1	-	P
As long as the product is similar, I could just as well be buying from a different company	H8_2	+	X
I am proud to tell others that I buy products from Microsoft. I would recommend Microsoft to others.	H8_3	-	P
For me, Microsoft is the best alternative	H8_4	-	P
I expect to stay with Microsoft for a long period of time	H8_5	-	X
As a consumer of Microsoft products, I feel that I am prepared to pay more for higher quality products	H8_6	-	P
I feel very little loyalty to Microsoft	H8_7	+	P

Table 47: H8 hypothesis and observed results

Statements	Hypothesis	Direction	Result
I believe in the values of the open source community's culture	H9_1	+	X
I am successful at supporting the values of the open source community's culture in my life	H9_2	+	X

Table 48: H9 hypothesis and observed results

Statements	Hypothesis	Direction	Result
Microsoft Office is important to me	H10_1	-	X
Microsoft Office is boring	H10_2	+	X
Microsoft Office is relevant	H10_3	-	X
Microsoft Office is exciting	H10_4	-	X
Microsoft Office means nothing to me	H10_5	+	X
Microsoft Office is appealing	H10_6	-	X
Microsoft Office is fascinating	H10_7	-	X
Microsoft Office is worthless	H10_8	+	X
Microsoft Office is involving	H10_9	-	X
Microsoft Office is not needed	H10_10	+	X

Table 49: H10 hypothesis and observed results

Statement	Hypothesis	Direction	Result
Overall, I am dissatisfied with Microsoft Office	H11	+	X

Table 50: H11 hypothesis and observed result

Statements	Hypothesis	Direction	Result
I have researched material to compare information about alternatives to Microsoft Office	H12_1	+	S
I have asked friends, family, or acquaintances for advice about alternatives to Microsoft Office	H12_2	+	S

Table 51: H12 hypothesis and observed results

5   Discussion

This chapter discusses the observed results, and the outcomes of hypothesis testing. First, the results of hypothesis testing for hypotheses 1 through 4 are discussed. Second, the results of hypothesis testing for hypotheses 5 through 12 are discussed. Third, the notable product-specific and user-specific switching barriers identified in the research are summarized.

5.1   Observed results of hypothesis testing relating to hypotheses 1 through 4

This section discusses the observed results and the outcomes of hypothesis testing for the hypotheses 1 through 4, which are classified according to the categories identified by Colgate & Lang (2001). The sub-hypotheses are discussed first for each one of the theorized switching barriers, namely relationship investment (H1), negativity (H2), apathy (H3), and service recovery (H4). The overall categories are then each considered, and the primary hypotheses are discussed.

5.1.1   H1-A – Comfort with Microsoft

Several authors cited comfort with Microsoft as a potential switching barrier (Stafford, 2006; Scoble, 2006; OpenOffice.org, 2008b). The results strongly support this hypothesis. It is clear that users who report having considered switching to OpenOffice.org did not end up doing so, in part, because they are comfortable with Microsoft. The results raise the question of what it is that they are comfortable with. It

may be that they are comfortable with the brand, due to Microsoft's substantial

investment in brand development for their company and products. Brand visibility and

consumer recognition improves consumer perception of brand quality and affects their

purchasing decisions with conventional products and services (Wulf, et al., 2005). It

would appear that the same effect occurs in the case of Microsoft Office and

OpenOffice.org.

It may also be that the concept of "comfort" takes on several different dimensions. It

may be that users are comfortable with things that they associate with Microsoft, such as

the look and feel of their software. This possibility is supported by the correlation

analysis of the response to hypothesis H1-A and the response to hypothesis H2-D, which

is whether or not users are used to the Microsoft Office interface. These responses are

partially correlated, possibly due to the fact that some of the comfort with Microsoft

stems from the familiarity with the interface of Microsoft Office.

It may also be that users perceive Microsoft to be the "expert" in the field of Office

suites, due to its leading position in the industry. Research has shown that expert

opinions increases consumer comfort with a product or service (Aqueveque, 2006). It

may be that users feel comfortable with Microsoft because they believe that, as the

market leader, Microsoft must have the best product offerings available.

This finding is not surprising, as it lines up well with the conventional wisdom of the

extant literature. It merits more specific consideration in order to pinpoint the specific

cause of the observed effect.

5.1.2 H1-B – Exclusivist culture of OpenOffice.org

The exclusivist culture of OpenOffice.org is commonly cited in IT professional communities as a barrier to its adoption by less technically inclined users (Miller, 2006). This hypothesis was not supported by the findings. In fact, the data shows a significant and strong trend in the opposite direction of that hypothesized, that is to say that users of Microsoft Office who had considered switching to OpenOffice.org but didn't did not feel that they would not be accepted into the OpenOffice.org culture.

This finding is surprising as it goes against the common view in the IT professional community, and is contrary to the arguments cited in the open source and trade press literature pools. Open source software development is sometimes practised as part of a cultural movement (Stallman, 1985). It may be that the perception that there is a culture surrounding OpenOffice.org is a view limited to developers and maintainers of the software who are seeking a sense of community as a motivation to participate in open source development (Bonnaccorsi & Rossi, 2006). One respondent to the survey commented to the researcher that the question about a culture surrounding OpenOffice.org was "silly", and that "anyone who thinks there is a open source culture is stupid". It may be that the view of this respondent is one that is shared by the sample population.

The open source literature has focused much on open source communities, particularly in

the context of open source ecosystems. It has examined how developer communities interact, and how these interactions lead to the creation and maintenance of an open source software product. It may be that the community effects highlighted in the extant literature to not extend to the end-user level. It is possible that end-users are not aware of, or don't care about open source communities, and hence to not see the exclusivist culture, or lack thereof as a switching barrier.

There has also been a recent movement in open source communities to "clean up their image", and to be more friendly and accessible to end users. It may be that this movement has made some headway and has largely succeeded in making users feel more accepted. It is possible that this issue may have been a switching barrier in the past, but is no longer. This possibility is supported by the most recent layout of the OpenOffice.org website, which emphasizes the needs of different types of users, and has different sections that directly address those needs in a personalized manner.

Further research is necessary to understand the extent of the effect of open source culture effects, exclusivist or otherwise, and their impact, if any, on the adoption of open source software.

5.1.3   H1-C – Discounted versions of Microsoft Office

Scoble (2006) proposed that discounted versions of Microsoft Office deter users from switching office suites. This hypothesis was not supported by the results. The response data failed to reach an acceptable level of significance ($p = 0.2137$). Respondents did not

particularly agree or disagree that the offering of discounted versions of Microsoft Office was a reason why they considered switching, but didn't.

This result is somewhat surprising as it is contrary to the views expressed in the literature. Further, Microsoft has executed a deliberate strategy in offering discounted versions of Microsoft Office to increase its adoption, and reduce the defection of their customers to competition, such as OpenOffice.org. It may be that Microsoft's discount strategy has not yet reached a level of maturity, or consumer awareness that positions it as a switching barrier. This strategy has been attempted in various forms for the past decade, and is continuously being adapted for new versions of Microsoft Office. It may be that Microsoft has not yet found the proper balance of product versions and targeted discounts to effect a change on the adoption of competing products.

Many computers are purchased with software pre-installed. It is possible that users do not assign in their mental model a dollar amount value to the portion of the purchase fee of the computer that goes towards the licensing of the software that is pre-installed on it. Many users see software such as office suites as an integral part of a computer, and do not conceptualize it as functionally different from the computer hardware, or operating system. They may factor the discounted versions of Microsoft Office into an overall perception of a discounted price for the computer, without considering it as a separate fee.

It is also possible that the cost of the software is not an issue for respondents of the

survey. Many respondents told the researcher that this question was not relevant to them because their employer paid for all their software. It may be that users do not attribute a value to the software in the conventional product sense, and hence are not affected by a discounted price in the predictable elastic price/demand pattern dictated by traditional product economics. The issue of the source of the software – whether respondents paid for it themselves, or had it provided to them – was deliberately overlooked in this research, as it is an area of research that has substantial depth and could serve as a study of its own. Further research into the effect of price variance of COTS software versus free open source alternatives is warranted.

5.1.4   H1-D – Social pressure to not switch

Social pressure has been suggested as a significant reason users switch to OpenOffice.org (Haugland 2008; OpenOffice.org 2008d), leading to the possibility that its converse may be a switching barrier. This hypothesis is not supported by the results. Respondents clearly indicated that social pressure was not a reason they did not switch to OpenOffice.org.

This result suggests that open source software as a whole, and OpenOffice.org more specifically has become sufficiently mainstream that the suggestion of its use does not evoke a negative response by peers of the user. Such a phenomenon has been seen in other product areas such as automobiles, where the suggestion of purchasing a foreign brand over a domestic brand result in peer pressure to purchase the latter over the former.

The IT professional community has frequently discussed the notion of company "fans", who blindly support a particular company independently of the merits of a particular product offering. It would appear that, at the user level, at least, this effect does not hinder the consideration of adoption of OpenOffice.org. Further research into peer and other social effects on the adoption of different types of software may shed some light on this result.

5.1.5   H1-E – Lack of belief in principles of open source movement

Several authors suggested that users switch to OpenOffice.org because they support the principles of the open source movement (Haugland, 2008; Schulz, 2008; OpenOffice.org, 2008d), leading to the possibility that lack of interest in the open source movement may be a switching barrier. The results support the hypothesis that this is not the case. Respondents indicated that they disagree with the notion that their lack of belief in the principles of the open source movement is a reason they had not switched to OpenOffice.org.

This finding is as expected, and consistent with the literature. While it has been shown that belief in the principles of the open source movement is a strong switching motivator, there is no reason that the converse would be true. The variety of user perspectives likely primarily consists of users who either support the open source movement, or are neutral to it. There are likely very few users who are strongly opposed to the open source movement, and they would probably not have considered switching in the first place, and

hence would not be represented in the study's sample.

5.1.6 H1-F – Poorly addressed language or localization needs

The availability of OpenOffice.org in particular languages and localizations has been considered by several authors as a motivation for users to switch (Ridling, 2007; OpenOffice.org, 2008b; OpenOffice.org, 2008d), leading to the possibility that users perceived otherwise and that such was a switching barrier. The results support the hypothesis that this is not the case. Respondents indicated that they disagree that OpenOffice.org does not meet their user language or localization needs and that this is a reason they had not switched.

This finding is as expected, and is consistent with the availability of OpenOffice.org. OpenOffice.org is in fact available in many more languages and localizations than Microsoft Office. One of the primary contributions of developers around the world to the OpenOffice.org project is customized localizations for uncommon or under represented languages and community needs. This practice strongly supports the notion that participation in open source is motivated by a particular, specific need that a developer seeks out to address (Bonaccorsi & Rossi, 2006).

Were Microsoft Office available in more languages or localizations than OpenOffice.org, such would potentially be a switching barrier. As this is not presently the case, due, in part to the fact that is necessary for Microsoft employees to develop every language and localization internally before they can be added, it is not surprising that there is no

switching barrier related to this aspect of the software's usage.

5.1.7   H1-G – Lack of interest in building and maintaining an open source community

OpenOffice.org (2008d) reported that a desire to build and maintain a community may

motivate users switching to OpenOffice.org, leading to the possibility that a lack of such

interest may potentially be a switching barrier. The results do not support this hypothesis.

Respondents indicated that they disagreed that one of the reasons they did not switch to

OpenOffice.org was because they had no interest in building and maintaining an open

source community.

This finding is not surprising as the target sample is very different from the commonly

considered populations in the open source literature. The notion of building and

maintaining an open source community is one that appeals to developers, and

stakeholders. Users typically do not get heavily involved in development communities.

They participate in a more peripheral manner, and contribute primarily through the

occasional reporting of bugs, and the promotion of the software to other users.

It may be that respondents indicated that they disagreed with the notion that a lack of

interest in building and maintaining an open source community was a reason they did not

switch because, while they are not interested in such activities, they do not consider it a

relevant decision factor for product categories such as office suites. It may be that their

primary decision factors are more practical, and of direct impact to them. While the

support or lack of an open source community might be an ideal situation factor, it may

not play a part in real world effects when competing for attention with more salient factors. While garnering interest in participating in open source communities may well work as a switching motivator, it is clear that the lack of such does not hinder adoption for users.

5.1.8   H1-H – Overserved by Microsoft Office

OpenOffice.org (2008b) stated that many users may be overserved by Microsoft Office, and listed it as a major reason users switch to OpenOffice.org, leading to the converse being a potential switching barrier. The results partially support the hypothesis that this is not the case and that users are, in fact, overserved by Microsoft Office.

Of the four factors used to assess whether or not users are overserved, three received significant support from the results. Respondents indicated that Microsoft Office is too expensive, that they don't use all of its features, and that the are not willing to pay more for additional features and improvements on existing features. These responses are consistent with the literature, and provide a strong indication that users of Microsoft Office are overserved (Christensen, 1997).

One surprising result was that users reported that Microsoft Office is not too complex. Perceived complexity is the fourth measure of whether or not users are overserved. The conventional wisdom in the IT professional community and in the trade literature is that Microsoft Office is far too complex for the average user, and that a simpler solution may be better. One possible explanation for this result is that users have been using Microsoft

Office for a long time and are habituated to it. As such, the complexity of the program is now transparent to them as they have already passed the steep learning curve, and have settled in to only using the functions and features that their routine tasks require.

It may also be that there are different classes of users and that less technically inclined users are more likely to find Microsoft Office to be complex than more technically savvy users. Further examination into the complexity dimension of the user experience with Microsoft Office may better explain this result.

Overall, it is clear that users are at least partially overserved by Microsoft Office, and that there is no likelihood at all that Microsoft Office fits perfectly to their needs and that this dimension acts as a switching barrier to the adoption of OpenOffice.org.

5.1.9 H1-I – Microsoft's understanding of users' needs

Colgate and Lang (2001) operationalized the concept of relationship investment by dividing it into two factors, the first being the notion that users feel that a company, such as Microsoft understands their needs, and hence users are weary of switching to a competitor. The results do not support this hypothesis. Respondents reported that Microsoft's understanding of their needs was not a reason they had not switched to OpenOffice.org.

This finding is somewhat surprising, as it is contrary to the results obtained by Colgate and Lang (2001) in their study. It may be that the phenomenon is different in the case of

software than with services such as banking and insurance, or conventional product categories examined in the literature. Perhaps users of software such as Microsoft Office do not feel a proximity to the parent company in the same manner as they do with a particular bank, and hence do not feel that the company can possibly understand their individual needs.

A separate examination of how users perceive that Microsoft understands and meets their needs with its products may help to better understand this result and identify further reasons why in the case of this study, a company's understanding of user needs was not found to be a switching barrier.

5.1.10 H1-J – Microsoft Office is the best deal overall

The second factor of relationship investment operationalized by Colgate and Lang (2001) was the notion that users feel their current product or service is the best deal overall, which acts as a switching barrier. The results do not support this hypothesis. Respondents reported that Microsoft Office being the best deal overall was not a reason they had not switched to OpenOffice.org.

This finding is unexpected as it is contrary to the results obtained by Colgate and Lang (2001) in their study. It may be that the phenomenon is different in the case of software than with services such as banking and insurance, or conventional product categories examined in the literature. It may be that users don't see Microsoft office as the best deal overall because they see it as the only viable option, regardless of its fit to their needs. It

is also possible that the measure Colgate and Lang recorded has a notion of dollar amount assessment in the concept of "best deal". Such a notion could possibly be confounded by the fact that OpenOffice.org is available at no cost to the user, with a concomitant change to the switching barrier.

Further assessment of the concepts of product value, and the idea of a "best deal" in the case of Microsoft Office and OpenOffice.org may reveal why users don't find Microsoft Office the best deal overall, yet continue to use it. A careful examination of potentially confounding factors may also better explain the observed result.

5.1.11   Discussion of collective results for H1

Taken collectively, the results do not support the hypothesis that relationship investment is a significant switching barrier between Microsoft Office and OpenOffice.org. Of the ten factors considered, only one received support as a switching barrier, namely comfort with Microsoft. Neither of the factors supported by Colgate and Lang's (2001) research received any support in the results.

It is possible that Microsoft has failed at its efforts in relationship investment, and hence has not garnered user loyalty as a result. It may be that their efforts have resulted in users having a sense of comfort with the company, but that the effects have not been uniform across other aspects of relationship investment. It is also possible that OpenOffice.org has done a good job of building a relationship with its potential users and has eroded away the relationship development Microsoft had previously done with its customers.

Further research specifically focused on the topic of relationship investment in the case of software may better narrow down the specifics of the observed effect.

5.1.12   H2-A – Fewer features or capabilities in OpenOffice.org

One of the most commonly suggested switching barriers in the open source and consumer and trade literature pools is the fewer features and capabilities of OpenOffice.org (Stafford, 2006; Scoble, 2006; Ridling, 2007). The results do not support this hypothesis. The measure failed to achieve a suitable level of significance for consideration.

Given the prevalence of this view in the literature, this result is somewhat surprising. A lack of features and capabilities is a classical switching barrier for products attempting to compete with a market leader. It may be that it is not a switching barrier in this particular case because OpenOffice.org is a disruptive product, and hence is entering the market with fewer features and capabilities at a lower price targeting an overserved user base. It is also possible that the distributed development model users for OpenOffice.org's creation and maintenance has lead to the creation of a large enough set of features and capabilities that users find it to be a wholly sufficient alternative to Microsoft Office. It may be that this factor was a limitation in the early days of OpenOffice.org, but that it has now been overcome to the satisfaction of users.

A careful enumeration and comparison of the features and capabilities between Microsoft Office and OpenOffice.org, and a targeted examination of user perceptions about them may help to better understand the observed results.

5.1.13 H2-B – OpenOffice.org compatibility problems

Several authors have cited OpenOffice.org's compatibility problems as a switching barrier (Stafford, 2006; Dolinar, 2008; Matzan, 2005; OpenOffice.org, 2008b). The results do not support this hypothesis. The measure failed to achieve a suitable level of significance for consideration.

This result is unexpected as it is a factor commonly cited in the literature. It may be that the term "compatibility problems" was too overarching and hence respondents were uncertain to what it referred. It is also possible that the major compatibility problems that users used to encounter with OpenOffice.org have been resolved and are no longer an issue that hinders adoption.

It is also possible that compatibility problems are only a small factor in the switching decision making of users. It is possible that its lack of significance in the results is due to other effects being stronger to a point that users are not sufficiently concerned about compatibility problems for the measure to achieve significance. Further research into the impact of compatibility problems, if any, on users' switching decision may explain the observed results.

5.1.14 H2-C – Lack of training or reference material for OpenOffice.org

The lack of training or reference material for OpenOffice.org has been listed by several authors as a potential switching barrier (Miller, 2006; OpenOffice.org, 2008b). The

results do not support this hypothesis. Respondents, in fact, indicated that they did not agree with the notion that a lack of training or reference material for OpenOffice.org was a reason they did not switch.

This finding is somewhat surprising, as it is contrary to the views expressed in the extant literature. It is possible that, the recent marketing efforts of OpenOffice.org to make the product, website, and associated resources more accessible have been successful and that users are now aware of the options available to them. The ubiquity of information access on the Internet has lessened the need for traditional training and hard-copy reference material. Many users are comfortable searching for help on the Internet.

It is also possible that training and reference material are not a concern because of the similarity of OpenOffice.org to Microsoft Office. Users may have all the skills they need from using their previous office suite. The similarity of the products may have significantly lowered this switching barrier.

A strong ecosystem of complementary vendors, training partners, and associated resources has bloomed around OpenOffice.org. The network of options available to users is likely as diverse as that offered by Microsoft, and likely to meet their needs just as well. Users probably do not see training or reference material as a concern as they view it to be a complementary offering for all office suites, and find other factors to be more distinguishing.

5.1.15   H2-D – Habituation to Microsoft Office interface

That users are used to the Microsoft Office interface is frequently listed as a potential

switching barrier (Miller, 2006; Matzan, 2005). The results strongly support this

hypothesis. Respondents strongly indicated that their habituation to the Microsoft Office

interface is a reason that, while they considered switching to OpenOffice.org, they did not

do so.

This finding is expected, and lines up well with the views expressed in the open source

and consumer and trade literature pools. Interface design is a topic that is frequently

discussed in the IT professional community, and highlighted as a challenge for many

open source projects, including OpenOffice.org. Once users are conditioned to using a

type of software in a particular way, having them relearn common tasks, even with

variances as small as different menu layouts, is a significant switching barrier.

OpenOffice.org has made a significant effort to mimic the interface of Microsoft Office.

Most of the basic features are done in the same way. However, many of the more

advanced features, and even some of the commonly used features require habituation to a

slightly different interface. Users that are new to OpenOffice.org, and office suites in

general, find the interface to be intuitive, as it is designed to be practical and logical.

Users that have used Microsoft Office for a long time expect the interface to be identical,

even when there are no particular individual merits for an interface layout decision.

OpenOffice.org has tried to strike a balance between a logical and consistent layout, and

commonality with the Microsoft Office layout. This finding demonstrates that the results are less than satisfactory from the user perspective and that further concessions may be necessary in order to attract a larger user market share.

5.1.16 H2-E – Slower performance of OpenOffice.org

The slower performance of OpenOffice.org has been listed as a potential switching barrier by numerous authors (Miller, 2006; Scoble, 2006; Ridling, 2007; OpenOffice.org, 2008b). The results do not support this hypothesis. Respondents indicated that they disagreed that the slower performance of OpenOffice.org was a reason they did not switch.

A possible explanation for this result is that the computer hardware currently available has made performance variations in desktop software negligible. The gap between software performance requirements and hardware has drastically lessened in recent years. It is possible that while OpenOffice.org may be slower in the performance of some tasks, this deficit is compensated for by the hardware, with little or no noticeable difference for the user.

OpenOffice.org has also taken significant steps towards addressing the perceived "bloat" of its office suite. It has added a quick loader option that mimics the behaviour of Microsoft Office on Windows and Mac systems. It has also improved the speed of opening different types of documents, such as text, spreadsheet, and presentation documents from within the suite. It may be that it has been successful in its efforts and

that users no longer find that there it performs slower.

It is also possible that in the modern multitasking environment of most desktop computers, a slower performance of one application simply results in an increased focus on another, concurrent application while the user waits. Multitasking users dynamically adjust their focus on multiple tasks at once, and shift between them seamlessly. It may be that multitasking users notice slower performance less than users who focus on a single task at a time. Further examination of how different users feel about the performance of OpenOffice.org may help better explain the obtained result.

5.1.17   H2-F – Poor security of OpenOffice.org

McMillan (2006) suggested that OpenOffice.org has poor security, and that this may be a significant concern to users considering switching. This hypothesis is not supported by the results. Respondents indicated that the perception that OpenOffice.org has poor security was not a reason they did not switch.

This result is not unexpected as it is an issue that only a few authors have covered in the extant literature. The security of open source applications is a serious issue when dealing with server applications, such as in corporate data centers. It is not a concern for users of desktop software on their personal PCs. The concept of security is generally limited to operating systems, and only extends to the application level when there is a specific concern with the nature of the application. Office suites, by design, are not inherently secure. They do not aim to protect data from theft or intrusion.

Further, OpenOffice.org is designed with the open source methodology that promotes code inspection to identify and address weaknesses. The best security is one that is predictable. The security of a closed source office suite is inherently unknown. Nevertheless, these issues are typically far more technical in nature than mainstream users' level of expertise. Security is not a metric users value in the assessment of office suites, and hence it does not act as a switching barrier.

5.1.18   H2-G – Poor spell-checking tools in OpenOffice.org

Matzan (2005) suggested that users may be put off by OpenOffice.org's poor spell-checking tools. The results do not support this hypothesis. Respondents indicated that the perception that OpenOffice.org has poor spell-checking tools was not a reason that they did not switch.

This result is not unexpected. Few authors have listed spell-checking tools as an issue of contention for issues. It is somewhat hard to believe that it is an important enough feature that its variance in the particularities between implementations in different office suites would be of significant concern to users.

It is also possible that the perception that OpenOffice.org's spell-checking tools are poor is erroneous. The spell-checking tools in OpenOffice.org behave slightly differently than their counterparts in Microsoft Office, but they are generally seen to be every bit as accurate, and more flexible. It may be that they are perceived as poor because they are very customizable, and the many options lead to user confusion. OpenOffice.org also

offers spell-checking in many more languages than Microsoft Office, as users can contribute new dictionaries to the project. Even the most obscure languages in the world are represented.

One area of contention alluded to by Matzan (2005) is the lack of inclusion of a grammar-checking tool in OpenOffice.org. This decision was deliberate on the part of the development team, as they felt that the technology behind grammar checking had not advanced sufficiently to make the tool more useful than harmful for the average user. This claim is supported by many anecdotal reports in the IT professional community of Microsoft Office's grammar checking tool incorrectly "correcting" grammar, resulting in sentences that were previously correct becoming nonsensical. Some authors have argued that it creates a false sense of security for users who depend on it to proof-read a language that is not native to them (Krishnamurthy, 2008).

Regardless of the cause of the introduction of this perception into the literature, it is clear from the results that this factor is not a significant switching barrier for users. More research is warranted to better understand this issue.

5.1.19   H2-H – Lack of flexibility of OpenOffice.org

Scoble (2006) argued that OpenOffice.org is less flexible than Microsoft Office and that this might be a significant switching barrier. The results do not support this hypothesis. Respondents indicated that the perception that OpenOffice.org is less flexible is not a reason they did not switch.

This result is not unexpected. The concept of "flexibility" is inherently context-specific and means different things to different users. The flexibility of a software may refer to its ability to perform specific tasks, to interact with other software, to be customizable, or its adaptability to novel uses. It is possible that users do not find the flexibility, or lack thereof of OpenOffice.org to be a switching barrier because they separate this metric into different value dimensions in their purchasing decisions.

It is also possible that the concept of flexibility is not significant when compared with other, more salient factors, and hence does not elevate to the level of switching barrier. A more succinct definition and a careful narrowing of the focus across each of the value dimensions that make up flexibility in a user's assessment criteria may help better explain this result and its level of impact on the adoption of OpenOffice.org.

5.1.20   H2-I – Decrease in productivity due to switch

Scoble (2006) also argued that users would suffer a decrease in productivity as a result of switching, and that aversion to such may be a significant switching barrier. The results do not support this hypothesis. Respondents indicated that they did not see a potential loss in productivity due to switching to OpenOffice.org as a reason they did not switch.

This result is somewhat surprising as it seems to contradict both the extant literature, and user responses to other questions. Respondents indicated that they felt that habituation to the Microsoft Office interface was a significant switching barrier. It stands to reason then that should they choose to switch, the unfamiliar interface in OpenOffice.org would result

in a loss of productivity as they adapted to the new ways of doing common tasks. It may

be that respondents found the question confusing, or did not equate a decrease in

productivity with the factors that may cause such.

It is also possible that users' familiarity with the Microsoft Office interface is purely of an

aesthetic nature, and that a change in the interface would not result in a decrease in

productivity for the user. Further examination of the concept of aversion to potential

decreases in productivity due to switching is in order to better understand this

phenomenon.

5.1.21   H2-J – Limited modularity of OpenOffice.org

Some authors have cited the limited modularity of OpenOffice.org as a potential

switching barrier (OpenOffice.org, 2008b; Ridling, 2007). The results do not support this

hypothesis. Respondents indicated that the perception that OpenOffice.org is less

modular was not a reason they did not switch office suites.

This result was not unexpected. Modularity is not typically a concern of end users,

especially those who are not technically savvy. The modularity of software is important

for building complementary software, plug-ins, modifications, macros, and so on. The

more modular the software, the easier it is to design around. It is likely that the literature

is reflecting the concerns of developers, and that such concerns do not extend to users.

Some authors have approached the concept of modularity from the perspective of the

availability of the components of the office suite independently. They have argued that one can install only Microsoft Word, or Microsoft Excel, without installing the rest of the office suite, whereas with OpenOffice.org, one must install the full suite. They have argued that this creates a bloat in the software that is undesirable for users who simply want to complete one task with the software. The results suggest that if this is a concern of some users, it is not a sufficient concern to act as a switching barrier.

5.1.22   H2-K – Dependence on Microsoft Office file formats

That dependence on the Microsoft Office file formats hinders user switching has been hypothesized by several authors (OpenOffice.org, 2008b; Dolinar, 2008), and is a topic of frequent discussion in IT professional communities. The results strongly support this hypothesis. Respondents indicated that they agree that dependence on the Microsoft Office file formats is one of the reasons they did not switch to OpenOffice.org.

This finding is not surprising, as it is one of the primary points of focus of discussion in the OpenOffice.org discussion. It is listed as one of the primary targets for corrective action in the OpenOffice.org strategic marketing plan as it is recognize as one of, if not the primary issue for users.

The sticking point with this switching barrier is that, by and large, OpenOffice.org fully supports the Microsoft Office file formats, including Word, Excel, and Powerpoint formats. The annoyance for users is where there are subtle variations in the way the program renders the file formats, leading to small changes in layout, macros, tables, and

other display features. This can occasionally completely change the display of a file, even when the internal representation, in the file, is virtually the same. Developers that understand the technical challenges are more forgiving for these limitations, and, in some cases even blame Microsoft for creating poor file format standards in the first place. To address the issue, OpenOffice.org has put substantial marketing effort into promoting open file formats such as OpenDocument Text. Their efforts have been so successful that the latest version of Microsoft Office, version 2007, supports the native OpenOffice.org file format.

Another point of annoyance for end users is the default file format. The default file format in OpenOffice.org is OpenDocument. Users must manually select a different file format if they want to save a document in a Microsoft Office file format. Many users cannot be bothered to change the default, or get confused by the meanings of file extensions and file types, and simply assume that there is limited or no support.

Regardless of the cause of the issue, it is clear that dependence on Microsoft Office file formats is a significant switching barrier for users. This barrier will have to be addressed in order to improve adoption of OpenOffice.org. Further research into user behaviour, habitual transactions of users, and the exact limitations that a dependency on a particular file format places on users may help improve the understanding of this phenomenon and create novel solutions to address the issue.

5.1.23   H2-L – Concern about open source license of OpenOffice.org

Members of the OpenOffice.org community indicated that they had received reports of users who were concerned about the open source license of OpenOffice.org and that this might be a switching barrier (OpenOffice.org, 2008b). The results do not support this hypothesis. Respondents indicated that they did not agree that a concern about OpenOffice.org's open source license was a reason they did not switch.

This result is not unexpected. The issue of user concern over licensing is only peripherally mentioned in the literature. Most of the focus on licensing is a debate between developers over which open source license best enables them to achieve their software development goals while maintaining the principles of the open source movement. Most users are not concerned, and indeed not even aware of the finer points of licensing, making it unlikely that such would be a switching barrier.

It is likely that users only concern themselves with the portion of the open source license that enables them to get a copy of OpenOffice.org at no cost. As such, from their perspective, so long as they are able to get the software for free, the rest of the license doesn't matter to them. Anecdotal evidence discussed in the IT professional community points out that few users even read software licenses, open source or otherwise. Users have trained themselves into clicking through license agreements blindly, without concern, or even note of the content (Magid, 2008).

5.1.24 H2-M – Fewer support options for OpenOffice.org

In its strategic marketing report, OpenOffice.org (2008b) listed user perception that there are fewer support options for OpenOffice.org as a potential switching barrier. The results do not support this hypothesis. Respondents indicated that they did not agree that a perception that OpenOffice.org has fewer support options was a reason that they did not switch.

This result is not unexpected. OpenOffice.org has a myriad of support options available. Most considered users are well aware of the support options available to them as they are readily displayed on the website where the software is available for download. OpenOffice.org also has a large number of community-based resources where users can help one-another to resolve challenging issues.

The issue in contention seems to be ubiquity of service providers. Some authors argued that users felt that it was safer to stick with Microsoft Office because, with the product in a market leadership position, support vendors would always be available. It is possible that this issue is one that affects corporate system administrators, and desktop support experts more than users themselves. It may be that support options are a subject of concern when acquiring products for other users, but when acquiring products for one's self, it is less of a concern. It is also possible that there was previously a lack of support options available and that the OpenOffice.org ecosystem's expansion has filled this gap to the satisfaction of users.

5.1.25   H2-N – Lack of familiarity with availability of OpenOffice.org

Some members of the OpenOffice.org community have suggested that it is possible that users are not aware of the availability of OpenOffice.org, and don't know how to acquire the software (OpenOffice.org 2008b). They suggest that this limited awareness may be a switching barrier for users. The results do not support this hypothesis. Respondents indicated that they strongly disagree with the notion that unfamiliarity with the how to get OpenOffice.org is a reason they did not switch.

This result is not surprising. The name of the software is also the website where the software can be obtained. It is hard to believe that any user who had considered switching to OpenOffice.org would not know how to get the software. Further, the open source license of the software permits redistribution. As such, it is available from a broad array of different sources, above and beyond the base download site.

It is possible that the reports in the literature are referring to a different group of users. Users who had not considered switching to OpenOffice.org may not even be aware of the software's existence, and as such would not be aware of its availability. Such users were not considered in this study. Further study with different groups of users may better explain the results, and shed some light on user awareness.

5.1.26   H2-O – Larger files with OpenOffice.org

Smaller file size has been suggested as a significant reason users switch to

OpenOffice.org (OpenOffice.org, 2008b; Ridling, 2007) leading to the possibility that its

converse may be a switching barrier. The results do not support this hypothesis.

Respondents strongly rejected the idea that a perception that OpenOffice.org created

larger files was a reason they did not switch.

This finding was not unexpected as OpenOffice.org tends to generally create smaller files

than Microsoft Office, especially when the default OpenDocument format is used. It is

possible that some users were concerned with larger file sizes in the case where an

original document is created in Microsoft Office, and then edited and saved in

OpenOffice.org. From time to time, this arrangement results in a larger file size.

OpenOffice.org openly promotes its use of the OpenDocument format and lists smaller

file sizes as one of the primary benefits. It is reasonable to believe that users who have

considered switching to OpenOffice.org would have come across this promotional

material and learned about the differences in file sizes. It is clear from the results that

there is no risk that a perception that OpenOffice.org produces large files acts as a

switching barrier.

5.1.27   H2-P – Lack of availability of OpenOffice.org on some platforms

One of the often touted advantages of OpenOffice.org is that it is available on a broad

range of platforms (OpenOffice.org, 2008d; Ridling, 2007), leading to the possibility that

a user perception that the converse is true may be a switching barrier. The results

strongly support the hypothesis that this is not the case. Respondents clearly indicated

that the perception of a lack of availability of OpenOffice.org for their operating system or computer was not a reason they did not switch.

This finding is not surprising. OpenOffice.org is available on the most platforms of any office suite currently in distribution. Its open source development models permits developers to readily port it to any platform that they wish. Microsoft Office, on the other hand, is only available on platforms that are explicitly supported by the company. This practice means that many of the less mainstream platforms are not supported by Microsoft Office, leaving users no alternative but to use OpenOffice.org on those platforms.

While some open source software is not always available on all of the platforms that the COTS software it competes with is available on, OpenOffice.org focused early-on in its development on ubiquitous access, and has seen hastened adoption as a result. It is hard to believe that any user could find themselves limited by the range of platforms supported by OpenOffice.org to a degree that it became a switching barrier.

5.1.28   H2-Q – Difficulty of customization of OpenOffice.org

Another listed advantage of OpenOffice.org is that it is is easier to customize (OpenOffice.org, 2008d; Ridling, 2007), leading to the possibility that a user perception that the converse is true may be a switching barrier. The results do not support this hypothesis. Respondents indicated that they disagreed that a perceived difficulty to customize OpenOffice.org was a reason they did not switch.

This result is somewhat surprising as it appears at first glance to contradict user reports that they are habituated to the Microsoft Office interface and dependent on Microsoft Office's file formats. Both the interface and default file formats of OpenOffice.org are customizable to nearly exactly match Microsoft Office. It follows that users might find the customization too difficult, but that does not appear to be the case.

OpenOffice.org's ease of customization is listed prominently on its website as a primary benefit of its use. It lends itself to to customization to a broad range of user preferences, and suitability to many different tasks. While, at first glance, it may appear that such features are beyond the technical expertise of average users, the results suggest that user are in fact quite comfortable with the customizability of OpenOffice.org; or, at the very least, users do not find that the customizability is limited enough, or important enough to be considered a switching barrier.

5.1.29   H2-R – Harassing anti-piracy features of OpenOffice.org

OpenOffice.org (2008d) encourages users to switch to its office suite to avoid the harassing anti-piracy features such as product keys, activation, and constant product validity verification present in Microsoft Office. It is possible that users think that OpenOffice.org might have such features and that this might be a switching barrier. The results strongly support the hypothesis that this is not the case. Respondents indicated that a perception that OpenOffice.org has harassing anti-piracy features was not a reason they did not switch.

This finding is as expected. Several authors have listed the lack of anti-piracy features in OpenOffice.org as a strong motivator for frustrated users to switch (Ridling, 2007). Given OpenOffice.org is available at no cost, and freely distributable under a permissive license, software piracy is rarely an issue, and anti-piracy features have never been considered for implementation. Users are becoming increasingly frustrated with anti-piracy features on software they legitimately purchased at a substantial cost, and software vendors are having to deal with customer churn to competitors who don't use such approaches. It would be hard to believe that users would think OpenOffice.org would have anti-piracy features of such annoyance that they became a switching barrier.

5.1.30   H2-S – Difficulty of learning and use of OpenOffice.org

Numerous authors have listed factors that appear to encourage switching to OpenOffice.org, such as its ease to learn and use (Ridling, 2007; Gralla, 2008; OpenOffice.org, 2008b; OpenOffice.org, 2008d). It is possible that a user perception that it difficult to learn and use could be a switching barrier. The results do not support this hypothesis. Respondents indicated that they did not agree that the perception that OpenOffice.org is harder to learn and use is a reason why they did not switch.

This result is somewhat surprising at first glance, as it appears to contradict the reports of respondents indicating that they were habituated to the Microsoft Office interface. It stands to reason that they would then find OpenOffice.org harder to learn and use, as it has a different interface. Yet, it may be that users recognize that, overall, OpenOffice.org

is of similar difficulty to learn and use and believe that they would readily learn the differences in interface without too much frustration. It is possible that users realize that the learning curve of OpenOffice.org and its common usage are both on par with those of Microsoft Office. In that light, it makes sense that any concerns about difficulty in learning or use of OpenOffice.org would not elevate to the level of switching barrier.

5.1.31   H2-T – Installation and testing time of OpenOffice.org

Some authors have indicated that OpenOffice.org takes less time to install and test (Ciurana, 2004), leading to the possibility that a user perception of the converse may be a switching barrier. The results strongly support the hypothesis that this is not the case. Respondents indicated that they did not agree that the perception that OpenOffice.org takes longer to install and test was a reason they did not switch.

This finding is as expected. OpenOffice.org installs much faster than Microsoft Office, and can be automated for mass deployment to reduce installation time on a large number of systems. Further, concerns about installation and testing time tend to be limited to system and network administrators in corporate environments. Most users install software on their computers infrequently. It is not at all surprising that they do not perceive the installation and testing time as OpenOffice.org to be a switching barrier.

5.1.32   H2-U – Legal risk of OpenOffice.org

One of the most often listed benefits of OpenOffice.org is that there need be no concerns

about legal problems related to the use of pirated versions of the software

(OpenOffice.org, 2008c; Beer, 2006). It is possible that users might perceive that the

opposite is true and that OpenOffice.org is a legal risk. The results strongly support the

hypothesis that this is not the case. Respondents clearly indicated that a perception that

OpenOffice.org is a legal risk was not at all a reason why they did not switch.

This finding is as expected. The licensing of OpenOffice.org is very liberal, and does not

restrict most activities that engender legal risk with COTS software, such as

redistribution, use on multiple machines, and tracking and verification of assigned license

documents. Further, concern about legal problems due to licensing compliance tend to be

limited to system administrators in corporations, large organizations are most likely to be

targeted for investigation of license violations.

Further, many users are not concerned about the legal risks associated with pirating

software that does have restrictive licenses. It is not at all surprising that they don't have

concerns about legal risks associated with using OpenOffice.org, and, hence there is no

associated switching barrier at all.

5.1.33   H2-V – Problems with audits and compliance verification with OpenOffice.org

OpenOffice.org (2008b, 2008d) listed one of the merits of switching to its office suite as

not needing to have any concern about audits or compliance verification. It is possible

that users might perceive otherwise, and that such could be a switching barrier. The

results strongly support the hypothesis that this is not the case. Respondents clearly

indicated that a perception of potential problems with audits and compliance verification with OpenOffice.org was not a reason they did not switch.

This finding is as expected. As with the concept of legal risk, the liberal licensing of OpenOffice.org, does, in fact, reduce the need for concerns about compliance verification or audits. This issue is also one that would be more of concern to system and network administrators rather than users, as users rarely, if ever, the subject of audits or compliance verification. It is not at all surprising that users do not expect problems with OpenOffice.org and that there are no associated switching barriers.

5.1.34   H2-W – Perception that OpenOffice.org is lower quality software

OpenOffice.org (2008b, 2008d) claims that OpenOffice.org is higher quality software than Microsoft Office. It is possible that users might perceive otherwise, and that such could be a switching barrier. The results do not support this hypothesis. Respondents indicated that they did not agree that a perception that OpenOffice.org is lower quality software was a reason they did not switch.

This finding is somewhat unexpected. Quality of a product is a standard value metric listed in the consumer marketing literature. It is possible that users find OpenOffice.org to be of equal quality to Microsoft Office. It is also possible that a general measure of quality is not a sufficiently succinct value metric to be elevated to the level of switching barrier. It is further possible that users agree that OpenOffice.org is higher quality, but that this value metric was not sufficient to get them to make the switch.

Research has shown that brand visibility improves consumer perceptions of brand quality (Wulf, et al., 2005). It would then stand to reason that Microsoft's high brand visibility would have instilled a perception of brand quality in users. If such effect exists, it is not apparent from the results. Further research into user perceptions of the quality of the software of different office suites may help better understand the significance of this result.

5.1.35 *H2-X – Lack of ready availability of development toolkits for OpenOffice.org*

The ready availability of development toolkits for OpenOffice.org has been suggested as a switching motivator (OpenOffice.org, 2008b; OpenOffice.org, 2008d). It is possible that a contrary user perception could act as a switching barrier. The results strongly support the hypothesis that this is not the case. Respondents indicated that a perception that OpenOffice.org does not have development toolkits readily available was not a reason they did not switch office suites.

This finding is as expected. OpenOffice.org has links to its development toolkits prominently displayed on its main website. It is clear to anyone who visits the website to obtain the software that toolkits are available. Further, it is unlikely that users would be concerned with development toolkits. Such concerns are more likely with developers. Most users are primarily concerned with using the office software as it is, and do not have the technical skills, or interest, to engage in development of extensions. It is not surprising that there are no switching barriers related to the availability of toolkits for

OpenOffice.org.

5.1.36   H2-Y – Concern over ability to inspect OpenOffice.org's code

OpenOffice.org (2008b; 2008d) listed the ability for users to inspect OpenOffice.org's code as a switching motivator. It is possible that a user perception to the contrary could act as a switching barrier. The results strongly support the hypothesis that this is not the case. Respondents clearly indicated that a concern that anyone can inspect OpenOffice.org's code was not a reason they did not switch.

This finding is as expected. Some of the IT professional community have argued that end users equate code obscurity with increased security, and that, as a result, the open source nature of OpenOffice.org may make some of the users uncomfortable. If this is indeed the case, such users are not represented in the study's sample. Perhaps such a concern keeps users from considering switching to OpenOffice.org in the first place, leaving them excluded by the sample control. It is also possible that it is indeed a concern, but that it does not elevate to the level of switching barrier.

The most likely explanation is that users who have considered switching to OpenOffice.org understand that code obscurity does not increase security, and, further, may in fact decrease it. They understand the benefits associated with the ability to inspect code, and understand that it helps reduce the number of bugs by making them easier to find and fix quickly. It is also likely that less technically savvy users who have considered switching to OpenOffice.org do not think about code inspection at all as part

of their decision factors, and hence are not likely to see it as a switching barrier.

5.1.37   H2-Z – Poor stability of OpenOffice.org

OpenOffice.org (2008b; 2008d) lists the better stability of its office suite in its marketing literature as a reason to switch from Microsoft Office. It is possible that a user perception to the contrary could be a switching barrier. The results do not support this hypothesis. Respondents strongly indicated that they did not agree that a perception that OpenOffice.org was less stable was a reason they did not switch.

This result is somewhat unexpected. The stability of software is a traditional value metric that users seek out when considering software acquisitions. Unstable software is highly undesirable as it causes a loss of productivity, and frustration for the user. It stands to reason that users would seek out the most stable software in their usage consideration. It is possible that users consider OpenOffice.org to be of equal stability to Microsoft Office, and hence to not see it as having an advantage along that value metric.

It is also possible that users agree with OpenOffice.org's marketing literature and believe that it is more stable. But, this increased stability is not enough of a motivator to get them to switch. It is further possible that the opposite is true, and that users feel that the stability of OpenOffice.org is not up to their standards, but that such instability is not sufficient to become a switching barrier.

More research is necessary to carefully define the concept of stability and examine the

performance of both office suites in that light. A comparison of the real stability of both products to user perceptions about their stability might shed more light on the extent user perceptions about stability affect their switching decision, if at all.

5.1.38   H2-AA – Concern about negative outcomes of switching

Colgate and Lang (2001) operationalized two facets of the negativity dimension of switching barriers for their research. The first facet was that users are concerned about the negative outcomes of switching. The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This result is unexpected. This measure was one of the prominent outcomes of Colgate and Lang's study. It is surprising that it failed to attain significance in a study of a similar design. One possible explanation is that the concept of negative outcomes of switching is too broad and that respondents were indifferent about it as a result. It is possible that in their switching decision assessments they break down negative outcomes into their component factors, such as those previously discussed, and do not consider them as a whole.

It is also possible that the phenomenon of concern about negative outcomes of switching manifests itself differently in the case of office suites than in the case of banking or insurance services. A closer examination of the specifics of user decision making with regards to the negative outcomes of switching office suites as compared to switching services may be able to better explain this apparent discrepancy.

5.1.39   H2-BB – Uncertainty of outcome of switching

The second facet of the negativity dimension that Colgate and Lang (2001) operationalized in their research was the notion that an uncertainty about the outcome of switching is a major barrier for users. The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This result is unexpected. As with the concern about negative outcomes discussed in the previous paragraph, this measure was one of the prominent outcomes of Colgate and Lang's study. It is surprising that it failed to attain significance in a study of a similar design. It is possible that the concept of uncertainty of the outcome of switching was too vague and that respondents were uncertain how to interpret it. It is also possible that, as previously discussed, this measure implies a compounding of factors that respondents only viewed as independent measures in their switching decision.

It is also possible that users do not feel an uncertainty about the outcome of switching. Perhaps they feel that they wholly understand what the outcome would be and find it undesirable overall. It is further possible that ambiguity in the response was due to different classes of users having conflicting responses, resulting in an insignificant mean when considered together. Separate analysis of different classes of users, divided along the lines of technical aptitude, demographics, or other personal characteristics may identify a confounding variable in this measure. Further research is in order to understand why this result appears to contradict the extant literature.

5.1.40   Discussion of collective results for H2

Examining the hypotheses related to negativity collectively, the results appear to, at best,

only very weakly support the hypothesis that negativity is a significant switching barrier

between Microsoft Office and OpenOffice.org. Of the twenty-eight factors considered,

only two received support as switching barriers, namely habituation to the Microsoft

Office interface, and dependence on Microsoft Office file formats. Neither of the

operationalized factors for negativity supported by Colgate and Lang's (2001) research

received any support in the results.

This result is somewhat surprising. Negativity was the second strongest overall

switching barrier in the case of services in the banking and insurance industry in Colgate

and Lang's research. Further, negative factors have been held by many authors to be

strong consumer switching barriers in many different contexts (Hirunyawipada &

Paswan, 2006; Aqueveque, 2006; Kwon, et al., 2008; Wakefield & Blodgett, 1999;

Reichheld, 2003). A possible explanation is that the phenomenon of negativity manifests

itself differently in the particular case of switching barriers between office suites. It may

be that there are confounding variables along orthogonal value axes that are not yet

accounted for in the extant theoretical models that explain this variance.

Further research is necessary to understand why the results appear to be contradictory.

As the results did not permit exploratory factor analysis, an operationalization of the

variables in a more restrictive manner that ensured a stronger statistical base may permit

better analysis and classification of the effects. Careful consideration of potentially confounding variables may also explain the variance.

5.1.41   H3-A – User resistance to change

Colgate and Lang (2001) found that another class of switching barriers is related to apathy. User resistance to change has commonly been listed as a prominent switching barrier (Stafford, 2006; Miller, 2006; OpenOffice.org, 2008b). The results do not support this hypothesis. Respondents indicated that their dislike of change was not a reason they did not switch from Microsoft Office to OpenOffice.org.

This finding is unexpected. The extant literature has examined consumer behaviours related to change and found change in numerous different contexts to be a significant switching barrier (Reichheld, 2003). It is unclear why the results in this case are contradictory.

A possible explanation is that the nature of the questionnaire made users self-conscious about their behaviour, and they felt embarrassed by their dislike of change and hence did not report it representatively. The survey was anonymous, and there were no implications about right or wrong answers, so such issues should have been properly controlled. Another possible explanation is that respondents were not opposed to change, but that other, more salient factors discouraged them from switching. The sample selection ensured that only users who had considered switching were considered. It stands to reason that users would not consider switching if they were resistant to change.

Further research that fleshes out different classes of users and compares their resistance to change in this context might better explain why this result appears to contradict the findings in the literature.

5.1.42 H3-B – User indifference

OpenOffice.org (2008b) suggested that one of the challenges going forward was reaching users who are indifferent, as indifference is a strong switching barrier. The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This result is somewhat unexpected. It appears at first glance to contradict the extant literature. Respondents were asked if they felt there was no point in switching office suites. It may be that this question did not achieve significance because different classes of users gave opposing responses, leading to a confounded results. Perhaps one class of users sees a point to switching office suites, and another does not.

It is further possible that whether or not there is a point to switching office suites is not an adequate measure of indifference. Further research is necessary with more clearly defined operationalizations to ensure that the concept is clear to respondents and that a significant measure can be obtained. Given the strength of apathy as a switching barrier as reported in the literature, it is likely that indifference does indeed play a strong part, and that they key lies in assessing it effectively.

5.1.43   *H3-C – Pre-installation of OpenOffice.org on new computers*

Authors have suggested that one of the switching barriers for OpenOffice.org is that it does not come pre-installed on computers (OpenOffice.org, 2008b). The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This finding is somewhat unexpected. Microsoft has partnered with many computer vendors to ensure that a trial version of its software is pre-installed on the computers before they ship to customers. Customers can easily purchase the software online once the trial version expires, with little effort required. It is possible that this strategy is only effective for getting users to use an office suite to begin with. It may not be a factor in a switching decision on the part of the user. Respondents who have considered switching in the sample already had Microsoft Office to begin with.

It is reasonable to believe that users who consider switching office suites would not likely wait until they purchased a new computer in order to do so, especially given the ease of acquiring and installing new software. Prior to the mainstream adoption of desktop computers, pre-installation of software was a more salient factor, as compatibility between software and hardware was a more prevalent issue. It is also possible that different classes of users view the utility of having an office suite pre-installed on a computer differently, leading to confounded results. Further examination that narrows down the classes of users, and the specific effects of software pre-installation is in order

to understand if this effect is a switching barrier to the adoption of OpenOffice.org.

5.1.44   H3-D – Plans to upgrade to newer office suite

Several authors have suggested that users time switches in concert with upgrade considerations. They have suggested that a significant switching barrier may be a lack of interest in upgrading their office suite software at the time of consideration (Haugland, 2008; Gralla, 2008; OpenOffice.org, 2008b). The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This result is somewhat unexpected as the effect is well documented in the literature. A possible explanation is that timing of upgrade does not translate well into the concept of switching barrier. It may be that respondents were confused by the question, and unclear on whether they were being asked if they were not planning on upgrading at the time they were considering switching, or at the time they were answering the questionnaire. Further, a timing-related switching decision is likely to have other confounding factors. It is possible that respondents viewed such factors independently and did not aggregate them into a timing consideration in their mental model of their decision making process.

In order to properly assess timing decisions, a longitudinal study may be necessary to examine the circumstances of a switch, and circumstances of periods in between switches to see if barriers can be identified. Such a study would be able to compare different classes of users and pinpoint the different adoption behaviours across circumstances for each class of user. It is likely there is indeed an effect related to upgrade timing, but that

this study's measure failed to accurately capture it.

5.1.45   H3-E – Belief that all office suites are the same

Colgate and Lang (2001) used two measures to examine the effects of apathy on switching decisions. The first was operationalized as the notion that users feel that all office suites are the same, and that such is a significant switching barrier. The results do not support this hypothesis. Respondents indicated that they disagreed that a perception that all office suites are the same is a reason they did not switch.

This result is somewhat unexpected. It appears at first glance to contradict the results of Colgate and Lang's study. A possible explanation is that users felt that office suites are similar, but not sufficiently the same to engender an apathetic response in their switching consideration. Perhaps they believe that Microsoft Office, on the whole is better, and reached this conclusion after having considered switching to OpenOffice.org. Another possible explanation is that the product category of office suite software has significantly different properties when compared to service categories such as banking and insurance, and that consumer consideration about the inter-category variations are different.

It is also possible that users felt that office suites are not the same, but that this difference was not a switching barrier in this particular instance. Perhaps other, more salient factors were more important to the users than a general measure of sameness. Research has suggested that personal identification with a product or service affects purchasing or switching behaviour (del Río, et al., 2001; Hirunyawipada & Paswan, 2006; Lin & Chen,

2006; Essoussi & Zahaf, 2008; Kwon, et al., 2008; Wakefield & Blodgett, 1999). It may be that respondents personally identify more with office suites than with banking or insurance services, resulting in different switching barriers. Further study is required to clearly define the differences between office suites and compare these differences to the user perceptions of these differences. Different classes of users may feel differently about this factor, and dimensions of personal identification with the product may be a confounding variable, which should be controlled.

5.1.46   H3-F – Too much bother to switch

The second measure used by Colgate and Lang (2001) to examine the effects of apathy on switching decisions was operationalized as the concept that users found that it was too much bother to switch office suites. The results do not support this hypothesis. The measure did not reach an acceptable level of relevance in the results.

This result is somewhat unexpected as it appears at first glance to contradict Colgate and Lang's findings. It may be that the concept of bother manifests itself differently with office suites than with banking or insurance services. There is a substantial amount of effort in terms of time investment and paperwork required to switch banks or insurance companies. Installing a new office suite is a matter of minutes of users' time. Perhaps there is a threshold of amount of time required to qualify as too much bother, and below this threshold, the potential of some amount of bother is not sufficient to qualify as a switching barrier.

It is also possible that different classes of users view the bother of switching office suites in a diametrically opposite manner. Innovative or technically savvy users might find the process of installing and trying out new software a desirable one, while less innovative or less technically savvy users might find the process burdensome and boring. Further study that separates different types of users, and controls for the time investment required to switch across product and service categories would help explain this result more satisfactorily.

5.1.47   *Discussion of collective results for H3*

Examining the hypotheses related to apathy collectively, the results do not at all support the hypothesis that apathy is a significant switching barrier between Microsoft Office and OpenOffice.org. None of the six factors considered received support as switching barriers. Even the operationalized factors for apathy supported by Colgate and Lang's (2001) research received no support in the results.

Colgate and Lang found apathy to be the most salient switching barrier in their study. Given the strength of apathy as a switching barrier, this present result is unexpected. It is very surprising to find no support for it at all in a study of similar design. It is unclear why there is such an important difference in the results. There are several possible explanations.

One possible explanation is that apathy plays a large role as a switching barrier in product and service categories that require a substantial time investment or hassle in order to

complete a switch. It is reasonable to assume that if the switching process is less

involving that users might be less apathetic to completing the switch. Another possible

explanation is that in the specific case of office suites, users do not feel like they have the

ability to switch products. This explanation is supported by several reports from

respondents who said that changing office suites wasn't really up to them, as it was a

decision their office or another family member made for them.

Further research is necessary to clarify these ambiguities. Such research should carefully

control for product classes along the lines of time investment required to switch. It

should also control for the ability to effect the switch unconstrained by external factors.

It is reasonable to believe that either or both of these factors could be confounding

variables that explain why the results obtained in this study are different from the extant

literature.

5.1.48   H4 – Service recovery

Colgate and Lang (2001) listed service recovery as a switching barrier. It was

operationalized as Microsoft having successfully resolved a complaint for users of

Microsoft Office. The results strongly support the hypothesis that it is not a switching

barrier in the case of office suites. Respondents indicated that the notion that Microsoft

resolved a complaint they had with Microsoft Office was not a reason they did not switch

to OpenOffice.org.

This result is as expected. Software does not lend it self to complaint resolution as

effectively as services such as banking and insurance. Such services are more personalized, with features, options, and details specific to each customer. If there is a problem with the service a particular customer receives, the customer can request that their service be changed to accommodate them. Resolving such complaints effectively enables companies to reduce customer churn.

In the case of office suites, there is one product available for all users. The products are not customized by the vendor for specific user needs. The release cycles of the products, even when factoring in patching, preclude proactive resolution of complaints in a manner that would be timely enough to be a switching barrier for competing products. If users have a complaint about an office suite, there are many ways for them to voice their complaints, but only in exceptional circumstances will it be resolved. Switching to another product is far more likely to resolve the problem than requesting service recovery. The name of the category itself highlights that it is a salient feature of services that may not readily port to products at all.

As software as a service (SaaS) grows in popularity, it may be interesting to see if service-specific characteristics such as the ability to engage in service recovery to reduce customer churn become more possible for software vendors. Further research comparing office suite software services may better assess how much the switching barrier Colgate and Lang found is confounded by whether the study considers products or services.

5.2   Observed results of hypothesis testing relating to hypotheses 5 through 12

This section discusses the observed results and the outcomes of hypothesis testing for the hypotheses 5 through 12, which involve user-specific switching barriers.

5.2.1   *H5 – Ethical considerations related to software piracy*

Tan (2002) found that ethical considerations affect customer purchasing intentions in the case of pirated software. Hypothesis 5 predicted that users that had considered switching office suites would have stronger ethical considerations with regards to software piracy than those who had not considered switching. The results do not at all support this hypothesis.

Of the nine questions used to assess the three dimensions of ethical consideration considered by Tam, namely moral intensity, perceived risks, and moral judgement, only one measure showed any significant between group variance. The remaining measures failed to attain an acceptable level of significance. The only significant variance was across the dimension of perceived risk, with the prosecution risk measure.

Respondents who had considered switching office suites more strongly agreed that it is unlikely they would be caught if they were to pirate software, by a significant margin, than respondents who had not considered switching office suites. This finding is contrary to the expectations based on the literature. OpenOffice.org (2008b) markets its office suite as a means of avoiding the risk of getting caught with pirated software. It stands to

reason that users who had considered switching may be doing so, in part, because they perceived a risk of getting caught.

The questionnaire was explicitly designed to not distinguish between legal and pirated versions of Microsoft Office. As such, it is likely that some percentage of the respondents that use Microsoft Office as their primary office suite are using a pirated version. It may be that the response is contrary to expected because users who have considered switching to OpenOffice.org are also more likely to pirate software, and this confounding variable is present in the results.

It also possible that users who have considered switching office suites are simply more aware of the circumstances of pirate software prosecution risks, and hence are better able to judge the risk accurately. It is possible that less aware users who are less interested in the details of the enforcement of copyright law are more swayed by anti-piracy campaigns that have been launched by Microsoft and other large corporations, and that their views have been skewed accordingly.

It is unclear why this measure alone generated significant variance between groups. Further research that isolates this variable more clearly apart from the other eight measures, and controls for different classes of respondents would help better explain the results.

5.2.2   H6 – Social class

Social class has been found to affect purchasing decisions. Due to the fact that Microsoft Office costs several hundred dollars, and that OpenOffice.org is available at no cost, hypothesis 6 theorized that users who had considered switching to OpenOffice.org may be of a lower social class than users who had not considered switching. The results do not support this hypothesis. The measure of social class used in this study, namely income level, did not significantly vary between user groups.

This result is unexpected. Proponents of open source software often proclaim that the fact that most software, such as OpenOffice.org, is available for free is one of the strongest motivations to use it. It stands to reason that users for whom money is more limited would be more concerned about cost, and would be more likely to consider switching to a cost-free product. Further, it seems to be inconsistent the previously discussed question where respondents indicated that they strongly believed that Microsoft Office was too expensive.

One possible explanation is that the cost of Microsoft Office was not significant enough to encourage users to seek alternatives due to cost. Research has shown that the effect of social class on purchasing decisions is strongest when the social significance of a product is high (Williams, 2002). It is possible that office suites are not socially significant products, and hence don't engender a different switching consideration behaviour from different social classes.

Another possible explanation is that the selected measure for social class of income level is not an adequate measure of social class in the specific case of office suites. Research has suggested that it is as predictive as other social class measures on its own in many cases (Giacobbe, 2008). It is possible that this study's design or the products in consideration are not suitable to this measure. Further research that examines the significance of the purchase price of Microsoft Office more directly, and compares it directly to the behaviour of different classes of users in different circumstances might be able to better explain this result.

5.2.3   H7 – Innovativeness

Consumer innovativeness has been shown to affect product adoption (Hirunyawipada & Paswan, 2006; Venkatraman & Price, 1990). Hypothesis 7 theorized that users that are more innovative are more likely to have considered switching from Microsoft Office to OpenOffice.org. The results strongly support this hypothesis.

Of the six measures of innovativeness in Goldsmith and Hofacker's (1991) domain innovativeness scale, five measures were significantly higher for respondents that indicated they had considered switching to OpenOffice.org than for respondents who had indicated they had not considered switching. The sixth measure failed to achieve a suitable level of significance in variance between groups of respondents.

The sixth measure, namely that the respondent is generally the first in his/her circle of friends to know the names of latest software, may be less relevant in the case of office

suite software than in the case of more traditional product categories such as clothing, music, or electronics. This measure tests a level of awareness of new introductions in the field. In many product categories, such introductions are difficult to miss as the means of communication between companies and potential customers are often limited to traditional media forms, such as consumer and trade publications, retailer advertising, and television advertisements. In the case of software, it may be that the Internet has changed the tangibility of this measure, and that the measure is weakened because the category of software is too broad to cover a single dimension of user interest. Nevertheless, it is clear from the significant results with the other five measures that innovativeness is indeed a salient factor that moderates switching behaviour.

This finding is as expected. It provides concrete evidence to further support the theoretical foundation that underpins the current understanding of consumer innovativeness and its effect on decision making by testing the theory in the previously unexplored area of office suite selection. It further supports the notion that more innovative users view the risks of switching to be much lower, and hence are more eager to adopt novel products. It also makes clear that separating user groups on the basis of innovativeness makes good market segmentation sense, as the user groups will display different adoption behaviour, and different marketing techniques are necessary to motivate switching behaviour.

Further research that examines the magnitude of the effect for different classes of software, such as productivity software, games, and utility software, and compared the

across-group magnitude of effect variation to that of traditional product categories would be particularly interesting. It would shed some light on how user innovativeness varies in effect in different contexts, and would help highlight appropriate strategies to address the different cases with targeted marketing efforts.

5.2.4   H8 – Loyalty to Microsoft

Several authors have described switching barriers that relate to customer loyalty (Stafford, 2006; Scoble, 2006; OpenOffice.org, 2008b; Miller, 2006; Haugland, 2008). Hypothesis 8 theorized that users that had considered switching from Microsoft Office to OpenOffice.org would have lower loyalty to Microsoft than users who had not considered switching. The results strongly support this hypothesis.

Of the seven measures adapted from Donio, et al.'s (2006) loyalty measurement scale, five measures were significantly lower for respondents that indicated they had considered switching to OpenOffice.org than for respondents who had indicated they had not considered switching. The two remaining measures narrowly failed to achieve a suitable level of significance in variance between groups of respondents.

The two measures that failed to achieve significance, namely that as long as the product were similar, the respondent could just as well be buying from a different company; and, that the respondent expects to stay with Microsoft for a long period of time may be less relevant in the case of office suites than with traditional product categories. The first measure implies a notion of buying a product. This research compared a product that was

available at a substantial cost against one that is available for free. Traditional research that uses this loyalty assessment measure always compared two products that were both available for a fee. It may be that this measure was confounded by this particular study's design and had less relevance as a result. The second measure implies that the choice to stay with Microsoft is in the hands of the respondent. As previously discussed, many respondents expressed that the switching decision wasn't always in their hands, and may be handled primarily by their employer, or another family member. This measure may have been confounded by the fact that respondents didn't always feel in control. Nevertheless, it is clear, with the five other significant results, that user loyalty is indeed a salient factor that moderates switching behaviour.

This finding is as expected. It provides concrete evidence to further support the theoretical foundation that underpins the current understanding of consumer loyalty and its effect on decision making by testing the theory in the previously unexplored area of office suite selection. The moderation of an individual's switching behaviour based on their attitudes towards a product or company is an important finding as it has implications for the entire open source movement, along with COTS software competition.

Further research that examined how to moderate user loyalty in the case of office suites, or a broader software category may help explain how to best put together targeted marketing to lower this switching barrier and increase the adoption of competing products.

5.2.5   H9 – Level of cultural identification with the open source movement

Cultural identification is thought to moderate purchasing and switching behaviour

(Oetting & Beauvais, 1990-1991; Oetting, 1993; Essoussi & Zahaf, 2008; Miller, 2006;

Ridling, 2007; OpenOffice.org, 2008d). Hypothesis 9 theorized that users who had

considered switching from Microsoft Office to OpenOffice.org would have a higher

cultural identification with the culture of the open source movement than users who had

not considered switching office suites. The results do not support this hypothesis.

This result is somewhat unexpected. Neither of the two measures of cultural

identification adapted from Oetting & Beauvais (1990-1991) achieved an appropriate

level of significance of between group variance. A possible explanation is that the two

measures used, namely that the respondent believes in the values of the open source

community's culture; and, that the respondent is successful at supporting the values of the

open source community's culture in his/her life were too vague and that respondents did

not understand the questions. Another possible explanation is that the notion of culture

does not apply evenly to the open source community as it does with more traditional

cultural measures such as ethnic or geographic cultural identification. The open source

community is made up of drastically varying groups, from all around the world, with

disparate objectives, and different forms and venues of representation. It is possible that

cultural association forms differently in the case of the open source community. It is also

possible that there is no cultural association at all.

The notion of a culture in the open source community is a hotly debated topic in IT professional circles. The lines along which the culture, if one truly exists, separates itself from other cultures is unclear. Culture is defined as a long-term, underlying characteristic that organizes cognitions, emotions, and behaviours (Oetting, 1993). Further research that analyzes each of these dimensions in open source communities, and compares and contrasts them may help better understand if the traditional definition fits for this context, or if a new term and theoretical foundation is necessary to describe phenomenon the open source community.

5.2.6 H10 – Product involvement with Microsoft Office

Product involvement, the personal relevance of a product to a user based on the inherent needs, values and interests of the users, has been shown to moderate purchasing behaviour (Lin & Chen, 2006; Xue, 2008; Kwon, el al., 2008). Hypothesis 10 theorized that users that have considered switching from Microsoft Office to OpenOffice.org would have lower product involvement with Microsoft Office than users that have not considered switching office suites. The results do not support this hypothesis.

This result is unexpected. All ten of the measures adapted from Zaichkowsky's (1994) refined personal involvement inventory to measure product involvement failed to achieve an appropriate level of significance of variance between the groups of users. Of the ten measures, five showed marginal effects in the direction hypothesized, but all of them fell well short of acceptable statistical significance, with the strongest effect only achieving a

P of 0.2222.

Combining the measures into a single score for product involvement reveals that both groups of users have a medium level of involvement with Microsoft Office (Zaichkowsky, 1994). The likelihood to have considered switching does not significantly vary the level of involvement across groups at all. One possible explanation is that the personal involvement inventory (PII) might not port well to involvement related to software. The PII has been tested with product categories including watches, athletic shoes, calculators, mouthwash, breakfast cereals, red wine, and advertisements (Zaichkowsky, 1985; Zaichkowsky, 1994). It has not been considered before with software. It is possible that the PII needs to be revisited and adapted to adequately measure product involvement in the case of software.

Several respondents indicated to the researcher that the questions related to product involvement were nonsensical, that they didn't understand them, and weren't sure how to answer them. These reports provide anecdotal evidence that the PII might not be a suitable measure for product involvement in the case of the subject matter of this study. Further research into the relevance of the PII for software, and, more specifically, to office suites may be necessary to refine the measure to generate more significant results.

Finally, it is also certainly possible that product involvement is simply not a salient factor in switching decisions for office suites, and that the lack of effect would persist with any measure, even one precisely adjusted for the software product category. It is possible that

users feel an equal amount of product involvement because they transpose the properties of one product onto another, and do not feel like they would be losing any amount of involvement by switching office suites, as the office suites are similar. It may be that office suites do not vary sufficiently along the constituent factors of product involvement to engender a variance in switching considerations across groups.

Regardless the cause, this outcome is an anomaly that the theory behind product involvement cannot currently account for. Christensen (2006) argues that such an anomaly provides an opportunity to improve the theory. It gives future researchers the opportunity to revisit the foundation layers in the theory pyramid, to define and measure the phenomena more precisely and less ambiguously, or to categorize the data better, so the anomaly and the prior associations of attributes and outcomes can all be explained.

5.2.7 H11 – Dissatisfaction with Microsoft Office

Dissatisfaction with a product is commonly associated with a desire to switch products (Athanassopoulos, 2001). Colgate and Lang (2001) reported in their study that those customers who had considered switching companies were more likely to be dissatisfied with their current company than those who had not considered switching. Hypothesis 11 theorized that users who had considered switching from Microsoft Office to OpenOffice.org would be more dissatisfied with Microsoft Office than those who had not considered switching office suites. The results do not support this hypothesis.

The single-question measure adapted from Colgate and Lang's study failed to attain an

acceptable level of significance of variance between the groups of respondents by a significant margin. The mean response for both groups was nearly identical (2.835 vs 2.849). Both groups indicated that they disagreed that they were on the whole dissatisfied with Microsoft Office.

This result is unexpected. It appears to contradict the extant literature on the effects of dissatisfaction on product switching behaviour. The classical assumption is that dissatisfaction with a product leads users to seek out alternatives, with which they might be more satisfied. A possible explanation for this result is that in the case of office suites, the initial motivation to consider switching is not related to dissatisfaction, but rather is related to another factor. Anecdotal evidence supports this possibility, as several respondents indicated that it didn't matter whether or not they liked their office suite as they had no choice in the office suite they use. It may be a necessary factor that users have the ability to switch products of their own accord in order for dissatisfaction to be a switching motivation.

It is further possible that this single-measure examination was insufficient to capture the concept of dissatisfaction along the value dimensions that users relate to. This possibility is supported by the user response that they felt that Microsoft Office was too expensive, that they don't use all of its features, and that they aren't willing to pay more for additional features and improvements on existing features. Clearly, they are dissatisfied with some aspects of Microsoft Office. Satisfaction is defined as the difference between user expectations and observed results for the performance, features, reliability, and

characteristics of a product. Further research that analyzes user satisfaction along each one of these dimensions, and compares them across office suites may be able to provide a better explanation for the phenomenon. This apparent anomaly presents another opportunity for further research to help improve the theoretical understanding of the impact of dissatisfaction on switching behaviour.

5.2.8 H12 – Tendency to search for information about alternatives to Microsoft Office

Colgate and Lang (2001) found that there was a correlation between customers' active search for information about alternatives and the likelihood to have seriously considered switching. Hypothesis 12 theorized that users that had considered switching from Microsoft Office to OpenOffice.org would be more likely to have searched for alternatives to Microsoft Office than users that had not considered switching office suites. The results strongly support this hypothesis.

This finding is as expected. Both measures of information searching, namely that the respondent had researched material; or, had asked for advice about alternatives to Microsoft Office, were significant higher for respondents that had considered switching office suites by a significant margin (means of 2.98 vs 4.67 and 2.80 vs 3.82). This result is not surprising. It is logical that users that had considered switching office suites would seek out information about alternatives available and use this information to make an informed decision about switching.

This finding supports the notion that this study is analogous to that of Colgate and Lang

(2001), as it demonstrates a similar response behaviour by respondents. This finding is also interesting when contrasted to other measures that failed to achieve significance, such as dissatisfaction. It is interesting that users that considered switching searched for information about alternatives, but were not dissatisfied with their current product. It is also interesting that this research by those who had considered switching did not lead to an increased product involvement over users who had not considered switching from exposure to additional marketing material about the class of product during their research.

The most interesting facet of this finding is its comparison to other anomalous findings. Further research that attempts to isolate the specifics reasons why this measure was significant, but other measures were not in the case of office suites may help to better identify the variances in user switching behaviours across product classes.

5.3   Summary of switching barriers

Table 52 lists the significant product-specific and user-specific switching barriers identified in this research.

Product-specific switching barriers	User-specific switching barriers
Comfort with Microsoft	User innovativeness
Habituation to Microsoft Office interface	Loyalty to Microsoft
Dependence on Microsoft Office file formats	Likelihood to have actively searched for information about alternatives to Microsoft Office

Table 52: Summary of switching barriers identified in research

6   Insights and conclusions

This chapter starts by discussing the implications of the observed results and generating insights for the stakeholders of this research. It finishes by summarizing the conclusions drawn by the researcher.

6.1   Implications and insights

This section discusses the implications of the observed results and generates insights that are part of this research's contribution to interested stakeholders. First, implications and insights for top management teams are discussed. Second, implications and insights for the IT professional community are discussed. Third, implications and insights for academia are discussed. This section concludes with a summary of the insights for all stakeholders.

6.1.1   Top management teams

The outcomes of this research serve as a road map to top management teams in companies that are promoting open source alternatives to COTS software by highlighting the primary switching barriers that need to be overcome to increase adoption of their products.

There are six switching barriers that top management teams need to overcome to increase adoption of their products. The first barrier is comfort with Microsoft. Users feel comfortable with Microsoft and its product offerings. Microsoft has a strong

international presence, and has nurtured an ecosystem of companies around its software offerings. Top management teams of competing companies face a strong and experienced incumbent . Few companies have the resources necessary to pull users directly away from Microsoft, let alone companies with open source offerings. The best strategy to deal with this issue may be to view the competing offering as a supplement, instead of a replacement to Microsoft's products for the time being. This strategy coincides well with the criteria developed by Rossi, et al. (2005) for a non invasive transition to OpenOffice.org. Users cling to Microsoft and its products out of a fear of losing the comfort they have developed in their day to day activities from years of using the same products, and doing things the same way. A company that suggests a radical change is likely to be ignored by most users. A smart approach to deal with the comfort barrier would be to gently introduce a competing product, such as OpenOffice.org, and market it as a supplement to Microsoft Office by promoting its unique features and highlighting their benefit for the user. For example, OpenOffice.org supports the increasingly popular OpenDocument format. It also supports one-click PDF export. Neither of these features is supported in Microsoft Office. By promoting parallel usage of OpenOffice.org, users can begin to use the product when they require the unique features that Microsoft Office doesn't offer. Over time, as they become more familiar with the product, their dependence, and comfort, on Microsoft's products will decrease, and whole transition to OpenOffice.org can be made more smoothly. In their case study using a similar strategy, Rossi, et al. (2005) found that users did not resist the change, and that they came to form positive opinions about OpenOffice.org and view it as a wholly

suitable replacement for Microsoft Office for their day to day tasks. There are no easy solutions to deal with the comfort switching barrier, but evidence suggests that a progressive approach is more likely to be successful than a brusque switch.

The second barrier is habituation to the Microsoft Office interface. Top management teams that are promoting OpenOffice.org as a product offering may wish to focus on highlighting the similarities between the Microsoft Office interface and the OpenOffice.org interface. Ironically, Microsoft's latest version of Microsoft Office, version 2007, has helped lower this switching barrier for OpenOffice.org. Microsoft Office 2007 has a radically redesigned interface that many users who are habituated to the old-style interface find frustrating and cumbersome. Such users are more readily switching to OpenOffice.org instead of upgrading to Microsoft Office 2007, as it allows them to continue to use the interface to which they are habituated, with only minor variations. This apparent miscalculation by Microsoft in its design choices may be a strong opportunity for proponents of OpenOffice.org to capitalize on user habituation and turn this switching barrier into a switching motivator. Top management teams should consider putting together marketing campaigns that position OpenOffice.org as the "status quo upgrade" to get all the novel features and improvements of an upgrade without a frustrating interface change. Further, the flexibility and modularity of OpenOffice.org are a strong asset for interface design. Complementary vendors could design custom versions of OpenOffice.org with interfaces tailored to behave like Microsoft Office, to further reduce the switching barrier for habituated users.

The third barrier is a dependence on the Microsoft Office file formats. This switching barrier has been at the core of the office suite debate for over two decades. It is clear from the outcomes of this research that users still do not feel that the issue has been resolved to their satisfaction. They demand nothing less than exact compatibility and portability. OpenOffice.org fully supports all Microsoft Office file formats, and prominently markets such. Yet, issues still arise when dealing with the more obscure portions of the closed Microsoft Office file formats, as the specifications are not open to the public to reproduce accurately. While the OpenDocument file format is making strong headway in Europe, where some governments have legislated its usage, there is still strong user resistance in North America and other markets. Top management teams that wish to promote OpenOffice.org as a whole replacement to Microsoft Office may have to make some hard decisions about how to deal with this issue.

The OpenOffice.org development community has resisted copying the behaviour of Microsoft Office as it argues that the specifications are inherently flawed, and do not follow their own rules. They argue that the Microsoft Office file formats are riddled with exceptions, ad-hoc code, and stop-gap measures, designed to only work with Microsoft's products, and that including such behaviour in OpenOffice.org makes no sense. This is all well and good from a technical standpoint, but the reality of the situation is that users don't care at all about the technical reasons behind an issue. They just want things to work the way they are used to. No amount of technical arguments will change that fact. A hard decision has to be made to address this issue. The best strategy would likely be to create a "compatibility mode" in OpenOffice.org that changes its default behaviour,

display mode, file format handling, and file saving, to behave exactly like Microsoft Office. In this mode, the file creation, and file handling would behave as "incorrectly" as Microsoft Office, but produce the results that the user expects based on their past use of Microsoft Office. Portability of files between Microsoft Office and OpenOffice.org would be guaranteed to be exact, even if it is considered technically imperfect. Vendors of OpenOffice.org could compile a custom version of the software that has this mode set as default, so that end users don't even have to set it in the first place. Of course, more technically savvy users would have the option to disable this mode (or not enable it in the first place, in the case of the main distribution), to continue to use specification-based file formats. While some members of the OpenOffice.org developer community might find this solution distasteful, it is necessary that top management teams push for this option in order to reach their goal of increased user adoption.

The fourth barrier is a lack of user innovativeness. Less innovative users are less likely to consider switching office suites. As this barrier is innate to users, it is far more difficult to deal with. Two strategies are likely to have an effect. The first is to appropriately segment the target user markets along the lines of user innovativeness. More innovative users are likely to respond better to appeals to the technical benefits of switching to OpenOffice.org. They are also likely to view the risks of switching to be lower. Traditional product-specific marketing that promotes the value metrics that these users are interested in will likely have the expected effect. On the other hand, less innovative users will not respond well to such marketing efforts. The marketing resources will be wasted on these users as their value-to-risk assessment is very different

from their more innovative counterparts. By saving marketing resources by not wasting them on a market segment that won't respond to them, these resources can be better allocated to a strategy that will result in gains in that segment.

The second strategy is to bypass user switching considerations entirely. As top management teams can't readily change user innovativeness, it will have an effect on their switching decision no matter what course of action is taken. The only solution is to remove the switching consideration altogether. One effective way would be to focus on pre-installation on new computers, or on bundling with other applications. The key to the success of this strategy is to capture this market as first-time users, instead of users that switch from Microsoft Office. Given the length of time Microsoft Office has been in the market, it is a particular challenge to find users that have not used it. A possible approach would be to focus on recently industrialized nations. A significant portion of the world's population has not yet entered the computer age. As computer usage continues to increase around the world, a beachhead in a country with a rapidly expanding infrastructure, such as China or India, may be the most effective strategy, and ultimately more effective than taking Microsoft head-on in their established footholds in North America.

The fifth barrier is loyalty to Microsoft. Microsoft has done an excellent job at developing and maintaining user loyalty towards the company and its products. This is a traditional switching barrier that is as prevalent with mainstream product categories as with office suites. Extensive research has shown that loyalty, including measures of

satisfaction, trust, and commitment, influence customer purchasing behaviour (Donio, et al., 2006; Reichheld, 2001; Essoussi & Zahaf, 2008; Bolton & Drew; 1991; Koufaris & Hampton-Sosa, 2002). Loyalty can be very difficult to overcome. The key for top management teams that want penetrate a competitor's market is to identify customers who may be potential defectors and focus on them. Happy, loyal customers are extremely difficult to draw away. So much so, in fact, that resources are best not spent on them. It is far more effective to target the once-loyal users who, for one reason or another, have begun to consider defection.

Rowley & Dawes (2000) suggest that there are four categories of users who may become disloyal: disengaged, disturbed, disenchanted, and disruptive, listed in order of the intensity of the disloyalty. Disengaged loyals are neutral and uninterested. They may have limited awareness of the product, or feel it doesn't meet their needs. Disturbed loyals are existing and continuing customers who are suffering a temporary perturbation in their loyalty status and are in the state of questioning previously accepted assumptions about the brand they patronize. Disenchanted loyals are customers whose attitudes have ceased to be positive towards the brand, but who have an overall neutral attitude towards the brand, rather than negative. Disruptive loyals are previous customers who have strong negative attitudes and behaviours towards the brand they formally patronized. Rowley & Dawes suggest a marketing strategy that focuses on segmenting the target market on the basis of these different types of potential disloyalty. By focusing on seeking to create or enhance these states, top management teams can position their competing product to step in as a replacement once the loyalty to the former company is

broken. Table 53 lists the four states and some of the means that customers come to be in those states. It can be used as a reference for top management teams to focus their marketing and customer wooing efforts.

Types of loyalty deviation	Potential causes
Disengaged	- Product is not relevant to their needs - Product is not perceived as affordable
Disturbed	- Exposure to promotion of competitive products - Problems or poor experience with product
Disenchanted	- Positive experience with a competitor - Change in match between customer needs and product features
Disruptive	- Strong dissatisfaction with product

Table 53: Causes of loyalty deviation

As Reichheld (1996) points out, by searching for the root causes of customer departures, companies with the desire and capacity to learn can identify business practices where the competition fails, and sometimes develop new and profitable relationship with customers as a result.

The last barrier is the likelihood to have actively searched for information about alternatives to Microsoft Office. This barrier should be considered more lightly than the previous as only its correlation with switching consideration has been establish. There is no evidence to support a causal relationship. It is possible that those who are already considering switching search for information on how to go about making such a switch. One should be cautious in assuming that the opposite may be true.

Nevertheless, if there were a causal relationship, the course of action for top management

teams of companies that wanted to promote adoption of OpenOffice.org would be a common-sense part of their marketing strategy to begin with. As the key lies in a search of information about alternatives to Microsoft Office, there is no possible harm in getting more information into the hands of potential users. It is hard to go wrong with a strategy of promoting one's product.

They key in this strategy is getting information to the masses of users who wouldn't otherwise have come across it. The traditional user base consists of technically savvy users who seek out new and innovative products of their own accord to try out. Getting the mainstream user base more interested is more challenging. Sun Microsystems has taken some steps in this direction by including advertisements for OpenOffice.org in products that mainstream users are more likely to come across, such as the Java runtime that is installed on most Windows computers. When the Java runtime updates, as the new software downloads, the user is presented with a small ad that lists the key value proposition of Microsoft Office, namely available at no cost, compatible with Microsoft Office, support for numerous operating systems, and one-click PDF export. This small bulleted note has begun to spread the word about OpenOffice.org to users who otherwise would not have even considered it. Its brevity encourages users to do some research about the product to learn more. It is this sort of minimalist, yet widely distributed message that will likely help expose potential users to the research material that will ultimately help them make their switching decision.

6.1.2 IT professional community

The outcomes of this research can help instruct the IT professional community on the areas that need focus to improve the adoption of open source software, and OpenOffice.org specifically. It can help put to rest some of the hotter topics by highlighting the areas that are of concern to the users, specifically. Too often, the IT professional community has lost sight of the concerns of users, and focused on the concerns of developers and the technical merits of products. This research can help ground all those arguments in an empirical base, from a different perspective.

The largest single insight for the IT professional community is the disparity between the espoused beliefs in the community, and the actual factors that affect a user's decision making process. Of the 45 product-specific factors drawn from the consumer and trade literature pools, only 3 factors proved to be significant switching barriers. While nearly half of these factors were listed as switching motivators in the literature, it is still clear that there is a significant misunderstanding of the user perspective in the literature. Many of these factors are of concern to developers, open source community leaders, systems and network administrators, and other stakeholders. But, only three factors are salient when it comes to user switching consideration.

The message going forward must be that the gap between the views of the open source community at large, and the views of users must be reduced. The best way to accomplish this goal is through increased user engagement. While a primary motivation for

developers to participate in open source software development is to scratch a personal itch (Bonaccorsi & Rossi, 2006) – and this is a laudable goal – developers must consider the potential benefits of an increased user base on the long term viability and relevance of the product to which they are contributing their time. Characterizations of users as leeches who do not contribute to open source projects are pushing away an important resource. Users are a key part to an open source ecosystem. They provide tremendous amounts of free advertising through word of mouth and other viral effects, advertising that brings in new developers along with new users, and, occasionally, even corporate sponsorship. Further, users are an important Geiger counter for failure. While the health of an open source ecosystem is best quantified by the strength of its network (Moore, 1996), the number and behaviour of users can be important metrics to understand mistakes, poor product design decisions, and incorrectly executed strategies; and, most importantly, they provide the means to measure the effectiveness of corrective action. It is a mistake to overlook this bountiful resource.

Technology author Chris Pirillo (2006) nails the issue on the head:

"What would the world of software be like if the inmates were running the asylum? I'd argue a lot more useful, and a lot more beautiful. But users are usually in the back seat when it comes to the evolution of a utility – from beginning to end. Let me put it to you this way: software is useless if there isn't anybody using it. The world of software is getting larger by the day, and more people are finding new and different ways to improve lives with digital code. Programmers suffer from a miscalculation of a user's wants,

needs, and desires. As a power user, I expect better, I expect faster, I expect smarter, I expect more. When I see a new piece of software that holds promise, I call out its shortcomings in the hopes it will be closer to perfection with the next revision. "

There is no shortage of user-based communities. The traditional model has seen communities grow around developers. Users were expected to contribute to developer-focused resources such as mailing lists, and bug tracking databases. Users feel intimidated in these environments, and so do not contribute. The key to success will be in turning around this model, and getting developers to visit and participate in user communities. Engage users on their turf, where they feel comfortable. Not only will this approach put users at ease, and help draw out better feedback from them, but also the environment itself is a telltale sign of how users aggregate around a piece of software. It hints at ways users want to interact with the product, and what they value about it.

6.1.3 Academia

The outcomes of this research lead to insights for academics in the area of open source research, and for academics in the area of consumer marketing research. The primary insight for the former is that the current representation of the switching barriers in the open source literature pool contains a large number of measures that are either insignificant, or are moderated by different types of stakeholders. Many of the issues discussed in the literature focus exclusively on the developer perspective. The foundational theories on the phenomenon of open source software development have

missed a crucial dimension that needs to be supplanted, the user perspective, as its effects are significant on the success of an open source product.

The current theoretical foundations that describe the open source phenomenon have a significant bias that misses the user perspective, which results in a skew in the strategies that describe how to develop successful products. The empirical evidence presented in this research demonstrates that there is a very real effect that has not been appropriately accounted for, and identifies a research gap. There is a strong opportunity to extend the current understanding of the theory of open source ecosystems to include the user perspective.

The primary insight for researchers in the area of consumer marketing is that several of the common scales that are used to predict user switching behaviour do not port well to consideration of users of office suites, and possibly software in general. Four extensively validated measures commonly used in consumer marketing research, namely social class, cultural association, product involvement, and dissatisfaction failed to achieve statistically significant results in a study design that was comparable to their intended usage. While this is a far cry from declaring these measures useless for the present subject matter, these results are anomalies that are not well accounted for in the theoretical foundation that underpins these measures. It is unclear exactly why these measures have strong predictive power for other product categories, but do not have the same effectiveness in the circumstances of this research. There is an opportunity to revisit the theoretical frameworks of these measures to attempt to revise the theory to

account for these discrepancies. Further research is warranted to examine the

confounding variables that may have also been involved.

6.1.4   Summary of insights for stakeholders

Table 54 summarizes the insights for the stakeholders of this research.

Stakeholders	Insights
Top management teams	Users should be segmented according to characteristics
	Strategic decisions must be made with OpenOffice.org to support the user perspective
	Introducing OpenOffice.org progressively will likely help improve adoption
	Different kinds of disloyalty need to be targeted differently
	Non-users may be best target for market segments of users with low innovativeness
IT professional community	There is a disparity between the developer and user perspective on switching barriers
	Users don't care about most of the factors considered in the literature
	Users should be engaged on their own turf to improve adoption behaviour
Academia	Theoretical foundations in the open source literature have a developer bias
	Factors salient to users are not captured in the literature
	Several consumer marketing measures do not predict switching behaviour well in the case of office suites

Table 54: Summary of insights for stakeholders

6.2   Conclusions

This research assessed the switching barriers between Microsoft Office and

OpenOffice.org. It concludes that the primary product-specific switching barriers are

comfort with Microsoft, habituation to the Microsoft Office interface, and dependence on

the Microsoft Office file format. The primary user-specific switching barriers are user

innovativeness, loyalty to Microsoft, and likelihood to have actively searched for information about alternatives to Microsoft Office.

Top management teams should consider the insights that a market segmentation of different types of users will be necessary to appropriately overcome the different switching barriers; that strategic decisions about the future of OpenOffice.org that concede to the user perspective will have to be made in order to increase mainstream adoption; that a progressive, supplantive approach will be necessary to introduce OpenOffice.org to users of Microsoft Office successfully; that targeting different classes of potentially disloyal users differently is necessary to effectively draw loyal users away from Microsoft Office; and, that targeting non-users might be the only viable strategy to deal with users with low innovativeness. The IT professional community should consider the insights that there is a disparity between the developer and user perspective on switching barriers for open source software; and, that engaging users on their own turf will be necessary to increase mainstream adoption behaviour. Academics should consider the insights that the theoretical foundations used to explain the open source phenomenon have a significant developer bias and fail to capture the factors that are salient to users of open source software; and, that several consumer marketing measures do not port well to the assessment of switching behaviour in the case of office suites.

6.3   Limitations

The primary limitations in this study are related to the fact that users of a single office

suite pair are assessed. While a large number of results were collected from prospective users of OpenOffice.org, it is debatable whether the results will generalize to other circumstances. There may be confounding variables not considered in this study. Further there may be limitations in the generalizability of the results due to the nature of the sample, as it consisted mostly of students in a university setting, in a single geography.

The sample is a limiting factor in this research. The sample size, while reasonable, is still smaller than desirable. Further, the sample consisted in large part of university students, and may suffer from a bias due to the lack of demographic diversity. The findings should be considered in that light.

The measure used to assess social class may have been overly restrictive given the sample used in this study. A large percentage of the sample consisted of university students, who have a limited range of income. Further, the measure for social status was defined as total household income before tax. There is room for ambiguous interpretation of this measure. A student could assume it meant his or her personal income while in school, independent of parental income. Or, a student could include his or her parental income in the measure. While the income ranges were all represented in the sample, nearly 30% of respondents selected the top category of over $85,000. As this measure is several years old, and has not been adjusted for inflation, it is possible that the categories are no longer representative of income ranges, and, that as a result, the upper end was too low. It is possible that had the income range upper limit been higher, and the sample more evenly distributed across income ranges, that an effect may have been detected that

did not achieve significance with the current study design.

6.4   Suggestions for future research

This research opens up numerous avenues suitable to further exploration. In addition to the research opportunities highlighted in chapter five, it would be interesting to examine the role of users in the context of an open source ecosystem by tracking their contributions. Social networking websites offer an opportunity to use their extensive data on network relations to track the information flow as it passes from one user to the next, and comparing this information flow, in aggregate, for all users of a particular product, to the health measures of the open source ecosystem. This outside-in look at an open source ecosystem would provide a contrasting view to the traditional inside-out examination, and highlight the relative importance of user participation on the health of the ecosystem.

It would be interesting to examine the variables assessed in this research more closely, particularly the correlation between them. It is likely that users feel similarly about many variables and that common factors could be identified within them. This research focused on the switching barriers. Many of the results indicated that the variables being considered were switching motivators. Future research that re-examined this data could potentially extrapolate classes of switching motivators and help improve the theoretical foundation behind reasons to switch office suites.

In this study, respondents were only asked if they had considered switching from Microsoft Office to OpenOffice.org. It is possible that some respondents who were

classified as not having considered switching had considered switching to an office suite other than OpenOffice.org. Future research that separated users who had considered switching to any other office suite from those who had not considered switching to any other office suite would be able to determine if a confounding factor affected the results of this study. Further, it would be interesting to classify different user characteristics according to the product they had considered switching to. Such classification may identify product personality factors that affect switching decision, such as those considered by Govers and Schoormans (2005).

It would be interesting for future research to consider the input of users who did switch office suites, and compare their responses against those who didn't. Such discriminant analysis in a single study would help establish a causal effect, and help identify further factors that may affect switching behaviour that may not have been identified in this research.

Another interesting research avenue would be a closer examination of product-specific switching barriers. In order to better examine the product-specific switching barriers, it would be useful to conduct research that separated actual product issues from perceived issues before use. Assessing the responses of users before and after switching from Microsoft Office to OpenOffice.org in a longitudinal study would help compare these facets. Such research would help separate misconceptions about the office suites from the real, practical experiences of the users, based on the properties of the office suites themselves. Interviews before and after with the participants would help isolate the

source of the misinformation that the study identifies, to provide insights on how to remedy the information gap.

It would also be interesting to compare and contrast switching behaviour between users with high and low involvement with Microsoft Office. A case study design that examined several users in each category in depth, and mapped out their behavioural reasoning using a grounded theory approach would be a good way of better understanding the effects of product involvement on switching consideration.

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Appendix 1: Paper questionnaire

Letter of Information

This questionnaire is part of a research study. Its purpose is to learn about people who use Microsoft Office. You may decline to answer the questionnaire or any individual question. If you withdraw from the research study part way through the questionnaire, the answers you provided before withdrawing will still be used in the research. A small gift, valued at approximately $0.25, will be provided upon completion of the questionnaire. There are no known risks to participating in this research study.

The data collected is anonymous and will only be available to me and my supervisor. It will be secured via encryption and password protection. Any publications about this research will report the data in aggregate form. It will not be possible to identify individual participants. The data gathered in this research will be kept indefinitely for the purpose of future research.

You may request the results of this study, or ask any questions by contacting the researcher at the address below.

This project was reviewed and received ethics clearance by the Carleton university Research Ethics Committee. Participants with concerns or questions about their involvement in the study may contact the ethics committee chair.

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Part 1

Q1: **Do you use any version of Microsoft Office (which includes Word, Excel, and Powerpoint) as your primary office suite?** *"Primary"* **office suite means used more than 50% of the time.** (YES) / (NO)

Q2: **Have you ever considered switching to using OpenOffice.org as your primary office suite?** (YES) / (NO)

Based on your replies to the first two questions, complete the parts identified in this grid:

	Q1 (Yes)	Q1 (No)
Q2 (Yes)	Parts 2, 3, 4, & 5	Part 5
Q2 (No)	Parts 4 & 5	Part 5

Part 2

Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please circle "N/A".

		Completely disagree		Neither agree or disagree				Completely agree	
H1-A:	**I am comfortable with Microsoft**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-B:	**I would not be accepted into the OpenOffice.org culture**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-C:	**Microsoft offers discounted versions of Microsoft Office**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-D:	**I was told to not switch from Microsoft Office to OpenOffice.org**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-E:	**I do not believe in the principles of the open source movement**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-F:	**OpenOffice.org does not meet my language or localization needs**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-G:	**I have no interest in building or maintaining an open source community**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-I:	**Microsoft better understands my needs**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

H1-J:	Microsoft Office is the best deal overall	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-A:	OpenOffice.org has fewer features or capabilities	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-B:	OpenOffice.org has compatibility problems	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-C:	There is no training or reference material for OpenOffice.org	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-D:	I am used to the Microsoft Office interface	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-E:	OpenOffice.org is slower	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-F:	OpenOffice.org has poor security	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-G:	OpenOffice.org has poor spell-checking tools	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-H:	OpenOffice.org is less flexible	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-I:	My productivity will decrease by switching to OpenOffice.org	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-J:	OpenOffice.org is less modular	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-K:	I am dependent on Microsoft Office file formats	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-L:	I am concerned about OpenOffice.org's open source license	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-M:	OpenOffice.org has fewer support options	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-N:	I do not know where to get OpenOffice.org	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-O:	OpenOffice.org creates larger files	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-P:	OpenOffice.org is not available for my operating system or computer	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-Q:	OpenOffice.org is more difficult to customize	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-R:	OpenOffice.org has harassing anti-piracy features	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

H2-S:	OpenOffice.org is harder to learn and use	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-T:	OpenOffice.org takes longer to install	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-U:	OpenOffice.org is a legal risk	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-V:	OpenOffice.org creates problems with audits and compliance verification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-W:	OpenOffice.org is lower quality software	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-X:	OpenOffice.org does not have development toolkits readily available	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-Y:	I am uncomfortable that anyone can inspect OpenOffice.org's code	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-Z:	OpenOffice.org is less stable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-AA:	I am concerned about the negative outcomes of switching	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H2-BB:	I am uncertain of what the outcome of switching office suites would be	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-A:	I do not like change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-B:	There is no point in switching office suites	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-C:	OpenOffice.org did not come pre-installed on a new computer	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-D:	I was not planning on upgrading to a newer office suite	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-E:	All office suites are the same	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H3-F:	It is too much bother to switch office suites	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H4:	Microsoft successfully resolved a complaint I had with Microsoft Office	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

Part 3

Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please circle "N/A".

		Completely disagree			Neither agree or disagree			Completely agree	
H1-H1:	**Microsoft Office is too expensive**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-H2:	**Microsoft Office is too complex**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-H3:	**I use all the features in Microsoft Office**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H1-H4:	**I am willing to pay more for additional features and improvements on existing features in Microsoft Office**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

Part 4

Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please circle "N/A".

		Completely disagree			Neither agree or disagree			Completely agree	
H5-1:	**Pirating software has a strong impact overall on the income of software programmers**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-2:	**My use of pirated software would directly cause a loss of income to the software programmer**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-3:	**My friends, relatives, or associates regard pirated software as unethical**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-4:	**Pirated software offers better value overall**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-5:	**Pirated software works as well as original software**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-6:	**It is unlikely that I would be caught if I were to pirate software**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-7:	**I would lose the respect of my friends, relatives, or associates if I were to pirate software**	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

H5-8:	In my opinion, it is morally wrong to pirate software	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H5-9:	One should always consider the possible moral implications before deciding whether or not to pirate software	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-1:	In general, I am among the last in my circle of friends to acquire new software after it becomes available	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-2:	If I heard that new software was available, I would probably not be interested enough to try it	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-3:	Compared to my friends, I have few software products	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-4:	In general, I am the first in my circle of friends to know the names of the latest software	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-5:	I will acquire new software even if I haven't tried it yet	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H7-6:	In general, I do not know the names of new software companies before other people do	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-1:	As a consumer of Microsoft products, I am willing to put in extra effort to buy products from this company	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-2:	As long as the product is similar, I could just as well be buying from a different company	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-3:	I am proud to tell others that I buy products from Microsoft. I would recommend Microsoft to others.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-4:	For me, Microsoft is the best alternative	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-5:	I expect to stay with Microsoft for a long period of time	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

H8-6:	As a consumer of Microsoft products, I feel that I am prepared to pay more for higher quality products	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H8-7:	I feel very little loyalty to Microsoft	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H9-1:	I believe in the values of the open source community's culture	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H9-2:	I am successful at supporting the values of the open source community's culture in my life	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-1:	Microsoft Office is important to me	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-2:	Microsoft Office is boring	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-3:	Microsoft Office is relevant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-4:	Microsoft Office is exciting	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-5:	Microsoft Office means nothing to me	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-6:	Microsoft Office is appealing	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-7:	Microsoft Office is fascinating	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-8:	Microsoft Office is worthless	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-9:	Microsoft Office is involving	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H10-10:	Microsoft Office is not needed	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H11:	Overall, I am dissatisfied with Microsoft Office	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H12-1:	I have researched material to compare information about alternatives to Microsoft Office	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)
H12-2:	I have asked friends, family, or acquaintances for advice about alternatives to Microsoft Office	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(N/A)

Part 5

Please circle the best answer for each category.

H6: **Total household annual**	**Age**	**Level of education**	**Gender**
income before taxes	(1) 18 – 21	(1) Have not completed high school (11 years of education or less)	(1) Male
(1) $0 - $14,999	(2) 22 – 25	(2) Completed high school (12-13 years of education)	(2) Female
(2) $15,000 - $19,999	(3) 26 – 30	(3) Completed 1-2 years of Undergraduate studies (14-15 years of education)	(N/A) Prefer to not answer
(3) $20,000 - $29,999	(4) 31 – 40		
(4) $30,000 - $39,999	(5) 41 – 50	(4) Completed 3-4 years of Undergraduate studies (16-17 years of education)	
(5) $40,000 - $59,999	(6) 51 – 60		
(6) $60,000 - $84,999	(7) 61 and over	(5) Completed 1-2 years of Graduate studies (18-19 years of education)	
(7) $85,000 and up	(N/A) Prefer to not answer	(6) Completed 3 or 4+ years of Graduate studies (20-22 years of education)	
(N/A) Prefer to not answer		(7) Post Graduate studies (23 years of education or more)	
		(N/A) Prefer to not answer	

Appendix 2: Online questionnaire

Microsoft Office User Survey
Filter Questions

* Q1: Do you use any version of Microsoft Office (which includes Word, Excel, and Powerpoint) as your primary office suite? "Primary" office suite means used more than 50% of the time.

Please choose *only one* of the following:

☐ Yes

☐ No

[Only answer this question if you answered 'Yes' to question 'Q1']

* Q2: Have you ever considered switching to using OpenOffice.org as your primary office suite?

Please choose *only one* of the following:

☐ Yes

☐ No

Part 2 - page 1
Please read the instructions carefully.

[Only answer this question if you answered 'Yes' to question 'Q1' *and* if you answered 'Yes' to question 'Q2']

* H1: Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
I am comfortable with Microsoft	☐	☐	☐	☐	☐	☐	☐	☐
I would not be accepted into the OpenOffice.org culture	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft offers discounted versions of Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐
I was told to not switch from Microsoft Office to OpenOffice.org	☐	☐	☐	☐	☐	☐	☐	☐
I do not believe in the principles of the open source movement	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org does not meet my language or localization needs	☐	☐	☐	☐	☐	☐	☐	☐
I have no interest in building or maintaining an open source community	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft better understands my needs	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is the best deal overall	☐	☐	☐	☐	☐	☐	☐	☐

part 2 - page 2

[Only answer this question if you answered 'Yes' to question 'Q1' *and* if you answered 'Yes' to question 'Q2']

* H2part1: Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
OpenOffice.org has fewer features or capabilities	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org has compatibility problems	☐	☐	☐	☐	☐	☐	☐	☐
There is no training or reference material for OpenOffice.org	☐	☐	☐	☐	☐	☐	☐	☐
I am used to the Microsoft Office interface	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is slower	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org has poor security	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org has poor spell-checking tools	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is less flexible	☐	☐	☐	☐	☐	☐	☐	☐
My productivity will decrease by switching to OpenOffice.Org	☐	☐	☐	☐	☐	☐	☐	☐

Part 2 - page 3

[Only answer this question if you answered 'Yes' to question 'Q1 ' *and* if you answered 'Yes' to question 'Q2 ']

* H2part2: Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
OpenOffice.org is less modular	☐	☐	☐	☐	☐	☐	☐	☐
I am dependent on Microsoft Office file formats	☐	☐	☐	☐	☐	☐	☐	☐
I am concerned about OpenOffice.org's open source license	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org has fewer support options	☐	☐	☐	☐	☐	☐	☐	☐
I do not know where to get OpenOffice.org	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org creates larger files	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is not available for my operating system or computer	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is more difficult to customize	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org has harassing anti-piracy features	☐	☐	☐	☐	☐	☐	☐	☐

part 2 - page 4

[Only answer this question if you answered 'Yes' to question 'Q1 ' *and* if you answered 'Yes' to question 'Q2 ']

* H2part3: Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
OpenOffice is harder to learn and use	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org takes longer to install	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is a legal risk	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org creates problems with audits and compliance verification	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is lower quality software	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org does not have development toolkits readily available	☐	☐	☐	☐	☐	☐	☐	☐
I am uncomfortable that anyone can inspect OpenOffice.org's code	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org is less stable	☐	☐	☐	☐	☐	☐	☐	☐
I am concerned about the negative outcomes of switching	☐	☐	☐	☐	☐	☐	☐	☐
I am uncertain of what the outcome of switching office suites would be	☐	☐	☐	☐	☐	☐	☐	☐

part 2 - page 5

[Only answer this question if you answered 'Yes' to question 'Q1 ' *and* if you answered 'Yes' to question 'Q2 ']

* H3andH4: Using the scale, please indicate how much you agree that each statement is a reason why you have not switched from Microsoft Office to OpenOffice.org. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
I do not like change	☐	☐	☐	☐	☐	☐	☐	☐
There is no point in switching office suites	☐	☐	☐	☐	☐	☐	☐	☐
OpenOffice.org did not come pre-installed on a new computer	☐	☐	☐	☐	☐	☐	☐	☐
I was not planning on upgrading to a newer office suite	☐	☐	☐	☐	☐	☐	☐	☐

	1	2	3	4	5	6	7	8
All office suites are the same	☐	☐	☐	☐	☐	☐	☐	☐
It is too much bother to switch office suites	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft successfully resolved a complaint I had with Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐

Part 3
Please read the instructions carefully.

[Only answer this question if you answered 'Yes' to question 'Q1' *and* if you answered 'Yes' to question 'Q2']

* H11: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
Microsoft Office is too expensive	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is too complex	☐	☐	☐	☐	☐	☐	☐	☐
I use all the features in Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐
I am willing to pay more for additional features and improvements on existing features in Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐

Part 4 - page 1
Please read the instructions carefully.

[Only answer this question if you answered 'Yes' to question 'Q1']

* H5: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
Pirating software has a strong impact overall on the income of software programmers	☐	☐	☐	☐	☐	☐	☐	☐
My use of pirated software would directly cause a loss of income to the software programmer	☐	☐	☐	☐	☐	☐	☐	☐
My friends, relatives, or associates regard pirated software as unethical	☐	☐	☐	☐	☐	☐	☐	☐
Pirated software offers better value overall	☐	☐	☐	☐	☐	☐	☐	☐
Pirated software works as well as original software	☐	☐	☐	☐	☐	☐	☐	☐
It is unlikely that I would be caught if I were to pirate software	☐	☐	☐	☐	☐	☐	☐	☐
I would lose the respect of my friends, relatives, or associates if I were to pirate software	☐	☐	☐	☐	☐	☐	☐	☐
In my opinion, it is morally wrong to pirate software	☐	☐	☐	☐	☐	☐	☐	☐
One should always consider the possible moral implications before deciding whether or not to pirate software	☐	☐	☐	☐	☐	☐	☐	☐

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part 4 - page 2

[Only answer this question if you answered 'Yes' to question 'Q1']

* H7: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
In general, I am among the last in my circle of friends to acquire new software after it becomes available	☐	☐	☐	☐	☐	☐	☐	☐

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
If I heard that new software was available, I would probably not be interested enough to try it	☐	☐	☐	☐	☐	☐	☐	☐
Compared to my friends, I have few software products	☐	☐	☐	☐	☐	☐	☐	☐
In general, I am the first in my circle of friends to know the names of the latest software	☐	☐	☐	☐	☐	☐	☐	☐
I will acquire new software even if I haven't tried it yet	☐	☐	☐	☐	☐	☐	☐	☐
In general, I do not know the names of new software companies before other people do	☐	☐	☐	☐	☐	☐	☐	☐

part 4 - page 3

[Only answer this question if you answered 'Yes' to question 'Q1']

* H8and9: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
As a consumer of Microsoft products, I am willing to put in extra effort to buy products from this company	☐	☐	☐	☐	☐	☐	☐	☐
As long as the product is similar, I could just as well be buying from a different company	☐	☐	☐	☐	☐	☐	☐	☐
I am proud to tell others that I buy products from Microsoft. I would recommend Microsoft to others.	☐	☐	☐	☐	☐	☐	☐	☐
For me, Microsoft is the best alternative	☐	☐	☐	☐	☐	☐	☐	☐
I expect to stay with Microsoft for a long period of time	☐	☐	☐	☐	☐	☐	☐	☐
As a consumer of Microsoft products, I feel that I am prepared to pay more for higher quality products	☐	☐	☐	☐	☐	☐	☐	☐
I feel very little loyalty to Microsoft	☐	☐	☐	☐	☐	☐	☐	☐
I believe in the values of the open source community's culture	☐	☐	☐	☐	☐	☐	☐	☐
I am successful at supporting the values of the open source community's culture in my life	☐	☐	☐	☐	☐	☐	☐	☐

part 4 - page 4

[Only answer this question if you answered 'Yes' to question 'Q1']

* H10: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
Microsoft Office is important to me	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is boring	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is relevant	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is exciting	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office means nothing to me	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is appealing	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is fascinating	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is worthless	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is involving	☐	☐	☐	☐	☐	☐	☐	☐
Microsoft Office is not needed	☐	☐	☐	☐	☐	☐	☐	☐

Part 4 - page 5

[Only answer this question if you answered 'Yes' to question 'Q1']

* H11 and12: Using the scale, please indicate how much you agree with each statement. If you are not sure, or prefer to not answer, please select "N/A".

Please choose the appropriate response for each item:

	Completely disagree 1	2	3	Neither agree or disagree 4	5	6	Completely agree 7	N/A
Overall, I am dissatisfied with Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐
I have researched material to compare information about alternatives to Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐
I have asked friends, family, or acquaintances for advice about alternatives to Microsoft Office	☐	☐	☐	☐	☐	☐	☐	☐

Part 5
Please select the best answer for each category.

* H6inc: Total household annual income before taxes

Please choose *only one* of the following:
☐ $0 - $14,999
☐ $15,000 - $19,999
☐ $20,000 - $29,999
☐ $30,000 - $39,999
☐ $40,000 - $59,999
☐ $60,000 - $84,999
☐ Over $85,000
☐ Prefer to not answer

* H6age: Age

Please choose *only one* of the following:
☐ 18 – 21
☐ 22 – 25
☐ 26 – 30
☐ 31 – 40
☐ 41 – 50
☐ 51 – 60
☐ 61 and over
☐ Prefer to not answer

* H6edu: Level of education

Please choose *only one* of the following:
☐ Have not completed high school (11 years of education or less)
☐ Completed high school (12-13 years of education)
☐ Completed 1-2 years of Undergraduate studies (14-15 years of education)
☐ Completed 3-4 years of Undergraduate studies (16-17 years of education)
☐ Completed 1-2 years of Graduate studies (18-19 years of education)
☐ Completed 3 or 4+ years of Graduate studies (20-22 years of education)
☐ Post Graduate studies (23 years of education or more)
☐ Prefer to not answer

* H6gen: Gender

Please choose *only one* of the following:
☐ Male
☐ Female
☐ Prefer to not answer

Submit your survey.
Thank you for completing this survey.