The Relationship Between Personality Traits, Learning Styles, and Website Interaction

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
May 3, 2014

Keywords:
learning styles, decision styles, average visit duration, personality, Google Analytics

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ABSTRACT

This study examines behavioral traits to determine what impact they have on average visit duration when interacting with a website, a major part of search engine and webpage performance metrics commonly reported in practice. A task-based design was created to examine participants' interaction with various websites containing a variety of media and information to determine what effect NEO personality traits, learning styles, and consumer decision making styles had on website performance and success indicators.

ACKNOWLEDGEMENTS

If patience is a virtue, I must be working with a bunch of saints! I have to sincerely thank Dr. Dianne Hall. She has worked with me and mentored me from the first day I met her, and I am so thankful for our relationship. She is much more than a teacher, colleague, and mentor – I would call her family.

Dr. Joe Hanna has not only been an amazing help and inspiration because of his achievements, but he was always there when I just needed to relax or vent – thank you. Dr. Leanne Skinner provided a lot of insight early on in the dissertation and gave me viewpoints I would not have necessarily seen on my own, and I really appreciate her time and efforts. Dr. Elisha Wohleb generously agreed to be an outside reader and provide valuable feedback for the dissertation.

I would also like to thank Dr. Sharon Oswald for giving me the opportunities she has over the years. I am not sure I would be where I am without her. Drs. Terry Byrd, Casey Cegielski, Zack Jourdan, and Teresa Lang, as well as my good friend Rick Yerby – all have been very supportive and helpful to me over the years and have encouraged me to proceed with this goal.

My family has always been wonderful, so that really goes without saying. Thank you guys for your support and all you've done for me. Finally, thank goodness for my wonderful wife for putting up with me in general and gently encouraging me to finally complete this undertaking. I would dedicate this to Hopey and Popa.

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CHAPTER ONE

INTRODUCTION

Every day is full of decisions and choices, from something as simple as deciding what to wear to work to something as complex as seeking product information for a major purchase (Robbins, 2004). Technology has only increased the complexity of decision making by bringing in new sources of information and access to thousands of records, websites, and search engines that perform much of the information gathering previously done manually. Information is nearly instantaneously attainable and easily accessible (Stangeland, 2007; van Horn, 2002).

Information systems are technological implementations of computer technology that have allowed us to catalog and store trillions of bytes of data in a format that is recognizable and retrievable by human minds. This has paved the way for developing complex knowledge management (KM) systems capable of almost re-creating the human mind, keeping information together in the form of knowledge for corporate and personal consumption (Grant, 1996; Holsapple & Joshi, 2002) as well as compiling and generating our own individual knowledge based on the many sources of information now available for use in daily decision making as well as corporate recommendations and choices. Companies have been created that thrive on mining data simply to create knowledge and generate conclusions from learning what publicly available information attainable through the internet actually holds. In fact, research has indicated that IS and KM go hand-in-hand and, when properly utilized, can lead to more knowledge generation and effective decision making in organizations (Melville, Kraemer, & Gurbaxani, 2004;

Santhanam, Seligman, & Kang, 2007; Yajiong, Huigang, & Boulton, 2008). This applies at the personal level as well, as individuals interact with IS every day, learning and absorbing actionable information from them.

However, technology has also given rise to information overload, an idea that too much information may be detrimental to good decision making. Information overload occurs when an individual is presented with so much information about a topic that he or she becomes overwhelmed and is unable to process or sort the information in order to effectively make a decision (Sicilia, Ruiz, & Reynolds, 2006; S. J. Simon & Peppas, 2005). Social media and search engines have only exacerbated this problem of as the amount of available information to search through increases (Eppler & Mengis, 2004; Hiltz & Turoff, 1985; Jones, Ravid, & Rafaeli, 2004). Google notes that over one million "spam" web pages (irrelevant or not useful, some even harmful) are created per hour (Google, 2013). Useful or relevant web pages are being created at an equally high rate, but those figures are not specifically reported by the search engine giant. One can easily see how likely information overload is to occur, especially given the amount of useless information that is available on the web.

Are the lines too blurred to determine where users are actually learning useful information versus attempting to escape the useless content? Essentially, the overflow of information has created an array of "noise" or useless information that an individual must sift through in order to find pertinent and relevant information needed for the decision at hand. In the end, despite how one gathers the information, it is the task of the individual to make the decision and/or act on the information (Robbins, 2004).

Because of the prevalence of online shopping, mobile technology, and a general push by retailers to integrate the web with physical locations, a need exists to understand consumers who

are making decisions based purely on information presented in an online environment. Additionally, marketing and data-gathering companies such as Google as well as social media companies like Facebook have developed products by studying how people behave online and have engaged their customers in such a way as to keep them online and interacting with their products. Studying human online behavior and anticipating need would be invaluable to online retailers as well as software developers. A system that assists and augments a decision made online is the difference between a decision support system and artificial intelligence which would make the decision for the user. This study focuses on the former, concentrating on assisting the decision-maker, trying to interpret who they are and what effect various personality elements have on behavior as determined by common website analytics and general use statistics.

This exploratory research seeks to answer questions about the relationship(s) between personality traits and traditionally reported web metrics. Specifically, personality aspects, decision styles, and learning styles are examined with their impact on time spent on a website. While there have been prior studies conducted that explore personality impacts on decision making or on learning, there has been little or no research to study the impact of these important behavioral elements on commonly reported web metrics. This research aims to explain variance in selected web metrics using personality traits as indicators.

Theoretical Basis

With any information system, there is a need to maintain quality in both technical aspects as well as informational content. A major theoretical component and framework for the exploration of IS usability and success is the DeLone and McLean IS Success Model which was based on Mason's (1978) and Shannon and Weaver's (1949) taxonomies of IS success.

Comparing their taxonomies to both Shannon and Weaver's (1949) three categories of IS success and Mason's (1978) five, DeLone and McLean (1992) proposed a total of six original categories of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. These came from a list of over 100 ways to measure the success of an information system, which they worked to narrow and consolidate.

System Use

DeLone and McLean (1992) further identified system quality as a measure for both technical success and information system. They characterized information quality as a measure for both semantic success and information output. System use (or intention to use), they argued, can represent effectiveness and success of the IS and is an indicator of recipient consumption of IS output. Repeated or continued use generally means the end-user was satisfied with the information and system quality enough to return and to continue interacting with the IS.

In their taxonomy, they describe two impacts: individual impact and organizational impact. Individual impact is characterized as "an indication that an information system has given a user a better understanding of the decision context, has improved his or her decision making productivity, has produced a change in user activity, or has changed the decision maker's perception of the importance or usefulness of the information system" (William H. DeLone & McLean, 1992, p. 69). Organizational impact is the effect of information on organizational performance. DeLone and McLean (1992) formulated the IS success model by applying Miles's (1980) ecology model. Miles's (1980) ecology model recognizes "the pattern of dependency relationships among elements of the organizational effectiveness process" (William H. DeLone & McLean, 1992, p. 83). The pattern of dependency they describe indicates that individual

decisions affect organizational decisions. Thus, as an individual finds success with an information system, those successes are passed on to the individual's organization.

Several researchers have conducted empirical tests to validate the interdependencies of the IS success constructs. Seddon and Kiew (2007) tested the relationships among system quality, user satisfaction, and information quality. Baroudi, Olson, and Ives (1986) found support for the relationship between user satisfaction and use. Fraser and Slater (1995) supported the influence of user satisfaction on system usage. In Gelderman's (1998) survey, a relationship between satisfaction and individual impact measures was confirmed. A study by Igbaria and Tan (1997) also indicated that user satisfaction has the strongest effect on individual impact. Table 1 summarizes the research of verifying consistencies of IS success model constructs.

Table 1. Summary of IS Success Research (McGill, Hobbs, & Klobas, 2003, p. 26).

Relationship	**Study**
System quality → User satisfaction	Seddon and Kiew (1996) Roldan and Millan (2000) Rivard, Porirer, Raymond and Bergeron (1997)
Information quality → User satisfaction	Seddon and Kiew (1996) Roldan and Millan (2000)
User satisfaction → Use	Baroudi et al. (1986) Igbaria and Tan (1997) Fraser and Salter (1995)
Use → Individual impact	Snitkin and King (1986) Igbara and Tan (1997)
User satisfaction → individual impact	Gatian (1994) Gelderman (1998) Igbaria and Tan (1997) Etezadi-Amoli and Farhoomand (1996) Roldan and Millan (2000)

Individual impact → Organizational impact	Millman and Hartwick (1987) Kasper and Cerveny (1985) Roldan and Millan (2000)

While many researchers focus on validation of IS success models, Seddon (1997) suggested modifications to the DeLone and McLean IS success model because of ambiguities regarding the definition and placement of the IS construct use. Seddon argues that *use* must come before impacts and benefits can be measured, but it does not necessarily cause them (P. B. Seddon, 1997). Seddon found *use* to be a behavioral construct and repeated or continued use to be a consequence of IS success.

Updated DeLone and McLean's IS Success Model

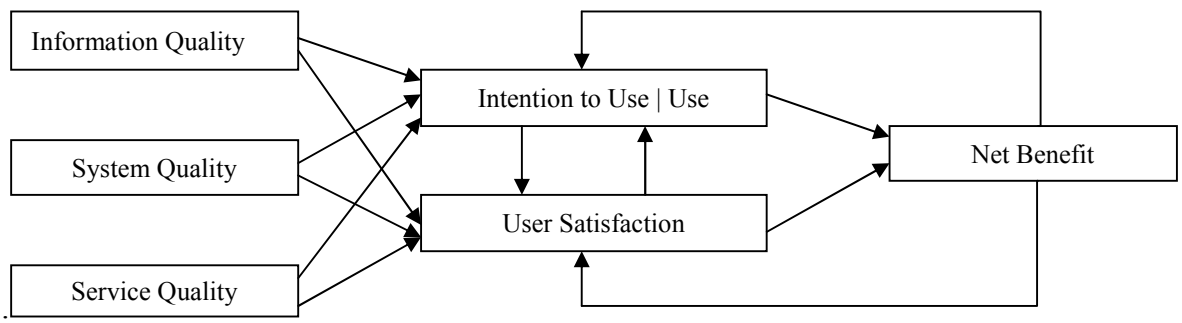
Since its original publication in 1992, more than 300 articles in refereed journals have used the D&M IS success model, or some modification of it (William H. DeLone & McLean, 2003). Ten years after publication of their first IS Success Model, DeLone and McLean reviewed articles that used their model and suggested updates to the model in light of the changes made in IS practice. After researchers pointed out problems combining processes and causal relationships, DeLone and McLean updated the IS success model by careful review of published articles and suggested alternative models.

Because of the continuing evolution of the IS success practice, many researchers suggested the inclusion of more *impact* on various levels of entities such as individual, organization, and industry (Brynjolfsson, 1996; Clemons, Reddi, & Row, 1993; Clemons & Row, 1993; Hitt & Brynjolfsson, 1994; Ishman, 1998; Myers, Kappelman, & Prybutok, 1998; P. B. Seddon, 1997). DeLone and McLean used the concept of *net benefits* in their modified model to combine the impacts into a single factor. To avoid ambiguity that could result from using the

term *impact*, DeLone and McLean preferred *net benefits*; impact could mislead the direction (positive or negative) between the objects. However, *net benefits* includes both positive and negative effects of implementing or using IS (William H. DeLone & McLean, 2003).

Rather than solely using the multidimensional concept of *use*, DeLone and McLean included both *use* and *intention to use* as alternative measures within the modified IS success model (see Figure 1) (William H. DeLone & McLean, 2003). They reasoned that intention to use is an attitude whereas use is an actual behavior. The inclusion of intention to use resolved some of the issues of process versus causal relationships Seddon pointed out (DeLone & McLean, 2003; P. B. Seddon, 1997). The updated model seems to resolve the problem of causal relationships among success measure constructs. Figure 1 depicts DeLone and McLean's updated IS success model. The new model demonstrates a reciprocal relationship between user satisfaction and continued use, indicating that users who are satisfied will perceive that there is a benefit to using an information system and continue to use that information system. On the other hand, individuals who perceive no net benefit to using an information system will discontinue its use.

Figure 1. Updated IS Success Model (William H. DeLone & McLean, 2003, p. 24).

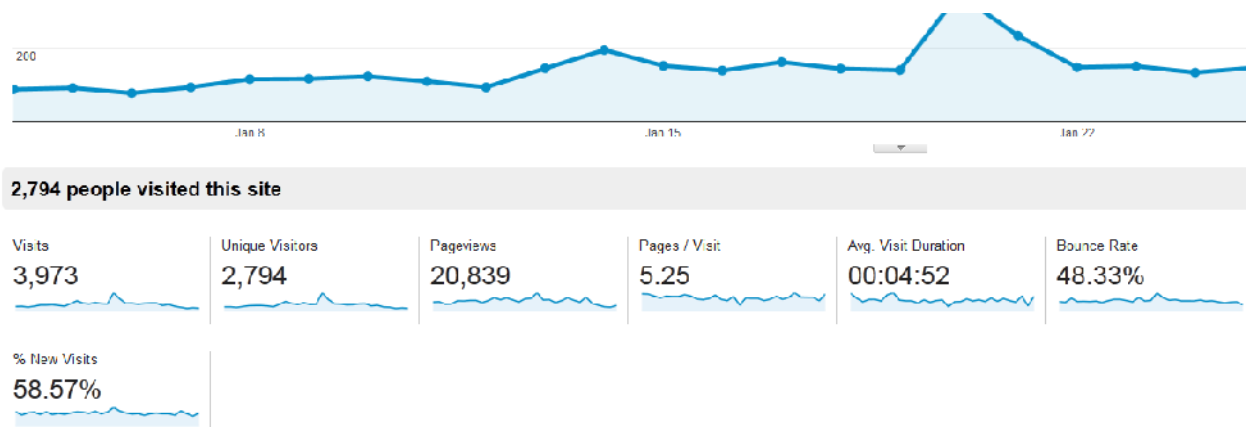


A website or web page is a publicly available information system. Websites are generally designed to market or sell a product or service or to simply provide general information. In a world of billions of websites, many with similar if not identical information,

use is totally voluntary. *Use* and *repeated use* of the website is an indicator of success and satisfaction by the user; the most common statistics available are time spent on the website and the number of individuals who visited said site.

Google reports there are billions of web pages with helpful information, but that only a small percentage of the web is truly cataloged and recorded. At a huge growth rate per hour of pages and sites added to the web, they rely on 200 unique signals as indicators of site relevancy. While the formula for Google's ranking algorithm is not public information, we do know that two of their major indicators that a site is useful and providing relevant results are the number of distinct visitors to a website and the **visit duration** on that website by an individual user (Google, 2013).

Figure 2. Google Analytics Dashboard page, indicating average visit duration as a reported metric.



The visit duration construct commonly used in search engine statistics, then, becomes synonymous with use. As indicated by the D&M model, those who find no perceived benefit with the website will leave, thus their visit duration will be low. Alternatively, those who are perceiving a high net benefit to the use of a website (e.g. they are learning or actively gathering information about the product or service) should have a higher visit duration on average. The

question, however, becomes whether or not the individual is using the website because he or she is satisfied with it and successful at searching and finding or whether he or she is spending that time wading through useless information and presentation and absorbing information that is irrelevant to his or her mission. Once the appropriate amount of learning is satisfied, does the user continue to "use" the website to simply browse and explore more, or does he or she leave immediately?

This research is designed to provide some insight into what most web developers and search engines present as a measure of success for website. It also investigates relationships between an individual's personality aspects and their activities on a website, particularly when using information from a website to develop a conclusion and make an informed decision.

For the purposes of this study, our Information System will be two websites for competing technology and telecommunication providers. Information presentation and formatting is an important consideration, so each site contains the same information in a variety of formats (Jiang & Benbasat, 2007). The information contained within each website will provide the opportunity for individuals to learn and absorb information and then act upon it with a recommendation based on their findings. Given the importance placed on time spent interacting with a IS in both academic and business environments, it is important to determine if there is a strong relationship between time spent and the "learning" that should occur when interacting with a website or general information system.

Research Questions

Table 2. Research questions.

RQ1	Is time spent on a website an adequate indicator that learning has occurred?
RQ2	How do individuals gather relevant information and discard irrelevant information online?

RQ3	Do traditional decision and learning styles apply in online decision making?
RQ4	What key aspects of personality affect information gathering in an online environment?
RQ5	Is the average consumer able to filter out all of the noise when examining information online?
RQ6	Is the average consumer easily distracted by extraneous content when examining information online?

Chapter 2 outlines and synthesizes relevant literature to serve as the foundation for this research study. This study relies heavily on the fields of information systems and marketing while additionally exploring key personality and character traits. Chapter 3 describes the methodology that was used to collect and analyze the data in this study, including a discussion of factor development and analysis techniques. Chapter 4 presents the data collected in the study and the results from the analysis of that data. The conclusions and interpretations of the results as well as the practical and theoretical implications are presented in Chapter 5.

The results from this study increase the knowledge base surrounding the interpretation of website usage statistics generally presented by major search engines, data miners, and web development corporations. A better understanding of what those numbers represent as well as what factors lead to those number and making quality, useful interpretations of information presented within a website is important to website development to support informed decision making.

CHAPTER TWO

LITERATURE REVIEW

This chapter describes existing literature and theoretical research utilized to build this study. A formative piece of the model used in this research is the Information Success model and its implications for system use. Further, this research explores various personality traits and aspects of behavior that are outlined in this chapter. Specifically, decision making, learning styles, and personality traits will all be examined as well as some additional traits that pertain to consumers such as impulsiveness and social styles.

Decision Making Steps

Decision making is the cornerstone of business. Resulting implications from decision making can be hugely beneficial or vastly detrimental to a company, so companies strive to obtain and retain decision makers who are able to make well-informed judgments and solve problems efficiently. Simon's (1987) model of rational decision making has become even more important, especially with the advent of the internet, smart phones, and social media where information is shared and obtained instantaneously. That research suggests that rational decision making begins with a well considered problem that the decision maker believes has an attainable solution (H. A. Simon, et al., 1987). While this is still valid, the availability of information has been vastly increased thereby increasing the effort needed to discard irrelevant information and increasing the importance of weighing alternatives and criteria.

Identify the problem

The first step to making a decision is to identify and define the problem (Robbins, 2004). It is necessary to know what one's end goal is in order to find appropriate information and related media to assist in solving the problem. Robbins (2004) suggests that a problem is only recognized when there is a discrepancy between the existing and desired states.

However, this study extends that definition to include general information seeking. For example, a problem state may exist when an individual wishes to gain knowledge about a subject or wishes to explore a new topic. Though there may not necessarily be a discrepancy, the user is still seeking additional information to facilitate answering a question and will make decisions regarding gaining information and thus knowledge that will complete their need for information with which to derive an answer.

Identify decision criteria

This is perhaps the most important aspect of decision making from the perspective of this study. In this process, the individual decides what is relevant to the problem or question and what is not (Robbins, 2004). Individuals, in this step of decision making, come to rely heavily on their own psychological makeup. Robbins (2004) states that an individual's interests, goals, and preferences affect the way that he or she will identify the decision criteria. These dimensions will affect whether the decision maker judges certain criteria to be relevant or irrelevant and will also result in a different set of criteria from person to person.

It is this step in the decision making process around which this study developed. It is believed that an individual's values and social styles along with their decision styles affect their criteria definition, and thus this study incorporates those aspects in order to gain a better

understanding of the mental processes of a person during this step of the decision making process.

Weigh criteria

After relevant criteria have been identified, the decision maker will weigh the criteria and commit to which ones are more important than others (Robbins, 2004). This often results in a decision criteria hierarchy, where the most important criteria must be met in order for a potential solution to reach some of the less important criteria for comparison. If a solution does not meet the initial, most important criteria, it is immediately eliminated, even if it does meet some of the less important criteria (Karlsson, 2007; Tan & Wei, 2006).

Generate alternatives

During this step, the decision maker must generate all possible alternatives or solutions to the problem or question at hand (Robbins, 2004). In order to prevent information overload, he or she must decide that all alternatives will not be examined and only a certain select few will be.

In the case of internet searching, search engines attempt to do this for the user. Potential matches that contain the information for which the user is searching are ranked according to what the algorithm considers to be most relevant to least relevant. This enables the user to have some assistance with generating their alternatives.

Evaluate each alternative

Each alternative generated during the previous step must be evaluated to determine how closely it satisfies the question or solves the problem (Robbins, 2004). Most of this process involves comparing the alternative to the criteria generated in a previous step. Less ideal alternatives are then discarded just as irrelevant criteria were discarded (Robbins, 2004).

In the context of the internet, when searching for solutions or information online, users will view a page and then surf away from that page if it is determined to be irrelevant. This is identified as a *bounce* in search terminology. Literally, a page has seconds to impress or present the user with the needed and relevant information. If it does not, within seconds of arriving to the page, the user leaves to evaluate another alternative, hence bouncing to another page or site (Ho & Dempsey, 2010; Kwon, Kim, & Lee, 2002).

Select the choice that scores the highest

To some this might be the hardest step, especially when there exists a number of excellent alternatives. Choosing the alterative that scores the highest among related criteria and when compared to other alternatives ends the decision making process (Robbins, 2004). The decision maker determines what he or she considers to be an adequate solution to the problem or an adequate explanation of the question. The end result may be a satisfaction of the desire to solve the problem or answer the question. Whether the solution or choice is the correct one at this point may be unknown at the time but the decision maker still receives some satisfaction of having selected a decision that he or she believes is the correct one or is most suited to his or her personality (Valenzuela, Dhar, & Zettelmeyer, 2009). This confidence and satisfaction may also impact future decisions and shape the method in which the individual makes future decisions (Politi, Clark, Ombao, Dizon, & Elwyn, 2011).

Characteristics of Decision Makers

Decision styles define the individual's primary pattern of decision making. An individual may certainly deviate from their primary style but both Robbins (2004) and Scott et al (1995)suggest that most individuals stick with a particular style of decision making; it becomes

habitual after it is learned and established. Once a person has established a style pattern, that style will typically influence every decision they make.

Consumers are a subset of decision makers. Context is the only varying factor; they are seeking a specific product or service for purchase rather than making a business or general decision. They have specifically be studied in marketing and consumer behavior literature to establish a profile that is relevant and explanatory to their behaviors as general decisions and buying decisions can be different (Sproles & Kendall, 1986). As a part of an overall profile for a decision maker, many different characteristics are explored in this literature review. Several sources and major development works are explored and synthesized. However, the primary constructs measured in this study as a part of decision making styles are: perfectionism, brand recognition, trendiness, and impulsiveness.

Rational

The rational decision-maker is a slow, careful thinker. He or she is deliberate and meticulous in defining a logical and careful approach and solution to a problem. This person's solutions are often based on habitual patterns and past experiences. Rational thinkers tend to be those who will think it out before acting (Robbins, 2004).

An internet user who is very rational would be one who would do a great deal of research before choosing a product or service. He or she would search through many websites, carefully reading and studying all material before making a commitment.

Locus of Control / Impulsiveness

Locus of control is the equivalent of a belief in fate. A person with a high locus of control believes he or she is in control of his or her own destiny and that he or she is responsible for that outcome (Robbins, 2004). This would affect decision making because those with a low

locus of control would often feel that it did not matter what decision that they make, the outcome will be whatever it is, without their action or influence. These people also may consider that they have low control over a situation and low confidence in their ability to affect a problem with some solution.

In the case of a website user, individuals with a high locus of control may be more thorough and persistent searchers of information, determined to find exactly what they are looking for. On the other hand, a website user with a low locus of control may trust the first piece of information or page they come to.

While Robbins (2004) defines impulsiveness as a distinctly separate construct, having three distinct sub-factors, it may be related to locus of control from the standpoint of the consumer. Those consumers who are highly impulsive may find themselves having a low locus of control. It may be an indication that they feel that they are not in control of their decision and thus they buy on a whim (Kacen & Lee, 2002).

On aspect of impulsiveness is an individual's ability to focus on the task at hand (Robbins, 2004). We might find these people to be the ones who visit a website and immediately click off of it because they changed their minds or were interrupted before completing the task (Speier, Vessey, & Valacich, 2003). We may also see impulsiveness in online shopping where people add a recommended item to their purchase at the time of checkout.

A second sub-factor of impulsiveness is the tendency of an individual to act or react immediately to a situation or problem. The last sub-factor is the ability (or inability) to think ahead. Highly impulsive people tend to live only in the here and now and satisfy only immediate needs to solve problems (Robbins, 2004).

Studies in consumer behavior and marketing have been conducted on impulsiveness for many years. Impulsiveness seems to be linked with a stimulus or trigger that causes an individual to be impulsive (Rook & Fisher, 1995). Marketing and behavioral analysts know this and target consumers with specific and deliberate placement of ads, products, and even with the arrangement or presentation of online media.

Procrastination

People who delay or avoid decision tasks or actually making a decision are procrastinators. Though this tends to have a negative connotation, procrastination could be mistaken for a desire of an individual to gather much more information before making a decision. However, taking too much time often results in lost opportunities and time (Robbins, 2004). In the high-paced world of internet use, procrastination could result in a missed opportunity to buy a product online or a missed piece of information from a news feed or a post by a friend on Facebook/Twitter.

Procrastinating consumers are likely the opposite of those who are brand conscious trendsetters. Those people will not be able to wait to have the latest and greatest trend as it hits the market (Hung & Tu, 2010). Procrastinators are also likely the opposite of consumers who are planners. Those people would likely have a common shopping routine that varies very little and is immune to procrastination because they value that plan and routine (Rook & Fisher, 1995).

Affect

The three emotions that Robbins (2004) suggests influence decision-making are anger, depression, and anxiety. One will note that only a few of a large number of emotions are included in this list but Robbins (2004) suggests that these are the most influential when it comes

to decision making. People with high levels of emotions or who do not have control over their emotions tend to make decisions based on them (Robbins, 2004). All of their solutions to problems are based on emotional responses before any other factor. These people may lean more toward a particular website or web page for information because it gives them an emotional connection rather than determining whether or not the information is truly relevant or useful.

Risk Tolerance

Individuals who are risk-takers are more able and willing to take changes. This includes being open to more radical alternatives and ideas to solve a problem. These people may be more open to hearing ideas and solutions than someone with a low risk tolerance who prefer tried and true methods or solutions (Robbins, 2004). There is greater chance of failing with higher risk, but, according to Robbins (2004), these people find the thrill of success to be worth the challenge of selecting a risky solution.

Confidence / Perfectionism

A person's overconfidence can negatively influence decision making because a person who is overconfident claims they know what they do not really know. It can create a closed-mindedness to new ideas and concepts and can create a tunnel-vision during decision making where a person is only open to one idea or solution. People who are overconfident also tend to ignore evidence that disputes or refutes the decision they have selected and believe the evidence to be flawed in some way, rather than their opinion or view of the problem being less than ideal (Robbins, 2004). People who experience overconfidence can also ignore reputable sources online and instead choose less relevant or more opinion-based websites.

Perfectionism is also a decision-making trait that has been influential in consumer-behavior studies (Hung & Tu, 2010; Sproles & Kendall, 1986; Wickliffe, 2004). Individuals

with high perfectionistic tendencies tend to look for the best option or product when making a decision (Hung & Tu, 2010). Their decision is often carefully planned and researched and is not made quickly or without reason. These individuals carefully weigh each option before making a decision or selecting a product (Hung & Tu, 2010). These consumers tend to have low confidence until they have achieved what they believe to be a satisfactory amount of information. In today's world, that could include customer reviews of a vendor or product online, warranty information, and perhaps even information about the company selling the good or service. Perfectionists would not stop until they had attained all possible information and could be extremely confident in their decision.

Brand Awareness

Though this may not be a factor in every decision, brand awareness and/or preference is a very important aspect of consumer decision-making with regard to product or service selection (Wickliffe, 2004). Many studies have found brand awareness or conscientiousness to be an important factor for individuals making decisions about product selection, whether the product is technology or not (Sproles & Kendall, 1986). It has even been shown to be a cross-cultural factor (Hung & Tu, 2010) and should be included with every complete definition of consumer decision making styles.

Decision making characteristics impact decisions made on a daily basis. With more decisions being made as a result of information collected and knowledge generated from online materials, decision making characteristics should also be important in a person's interactions with a website.

Hypothesis 1: An individual's decision making characteristics impact his/her website visit duration.

Learning Styles

Learning styles affect the way in which an individual captures and processes information and subsequently gains knowledge. People tend to gravitate towards a particular learning style. In the case of websites and web development, certain users with a particular learning style may be attracted to a particular type of web page that appeals to their style of learning (Appiah, 2006).

In their research, James and Galbraith (1985) present learning styles that have been well supported and documented throughout psychological and IS research. Though technology changes every day, learning styles and the information presented within and utilized through technology remains the same. The information presentation generally falls within one of a few formats that are still relevant to a specific learning style. The four learning styles are: aural, interactive, print, and kinesthetic.

Aural

Aural learning is learning by listening. People who do not tend to be outspoken but prefer to listen to information presented verbally are aural learners. Individuals who like audio tapes and lectures could also be considered aural learners (James & Galbraith, 1985). These people may prefer websites with lectures or audio samples to hear the information presented on the screen. Because the information online has traditionally be text-based information, aural learners may be less drawn to websites and more drawn to other types of media.

Interactive

Interactive learners want to participate in the learning experience, as opposed to aural learners who want to simply hear someone else explain. These people often explain or discuss with others to make sure they understand a subject or problem (James & Galbraith, 1985).

Website users who are highly interactive learners may be those that participant actively in social media, in wiki or community groups, and discussion boards.

Print

The print learning style suggests that a person learns best by simply reading or studying a problem. A person who prefers to study a textbook solution to a problem would be an example of a print learner. These people typically retain what they read very easily (James & Galbraith, 1985). Learners who prefer print media should be well acclimated to online materials. Though the web is growing in video and interactive materials, websites, including social media, is still mostly text-based.

Kinesthetic

Kinesthetic learners are motivated by their senses. For example, they like to learn by being hands-on or touching. These individuals would prefer interactions where they can use a combination of their other senses in order to grasp a problem or scenario (Felder & Silverman, 1988). Web based kinesthetic learners are going to look for interactions that untraditional and extraordinary. They may be looking for websites that have a combination of many types of materials and information presentations.

Visual

Visual learning is all about seeing. Visual learners want to watch someone demonstrate a task or action but do not necessarily want to participate in it as they learn it. These people prefer graphs, images, and visual elements to learn (James & Galbraith, 1985). Visual learners are well suited for internet learning and decision making. Most quality websites contain a variety of images and videos which are ideal for visual learners. However, given the plethora of websites

available, these learners should have no problem locating relevant information in the format they prefer.

The Felder-Silverman (1988) model of learning styles examines more of the behavioral aspects of learning. Their research, which builds upon James and Galbraith's information presentation research, suggests that the learner falls anywhere along a linear point between two extremes for four categories. Each of these categories and extremes are highly related to those created by James and Galbraith (1985) but may explain more behavior or a way of processing information when learning rather than simply a category of information presentation.

Active / Reflective

Active learners learn by doing. They would closely follow the interactive category as presented by James and Galbraith. These types of learners behave by seeking out groups, asking questions, and discussing materials. Aural or print materials may be boring to them and they may lose interest. On the other side of this spectrum, the reflective learner may prefer aural or print materials so that they can study and reflect on them (Graf, Viola, Leo, & Kinshuk, 2007).

Sensing / Intuitive

Sensing learners are learners who learn facts and prefer hard evidence. These people may be perceived as closed minded and annoyed by opinion. They follow methods and clear-cut instructions well. Sensing learners may also be called kinesthetic learners. Intuitive learners on the other hand may take large leaps forward, assume conclusions and then try to prove them, or discover new relationships that others did not previously envision (Graf, et al., 2007).

Visual / Verbal

Visual / verbal learners are closely tied to visual and print categories from James and Galbraith (James & Galbraith, 1985). As the name suggests here, visual learners prefer to learn

by seeing, traditionally in the form of graphs, images, and possibly print. Verbal learners would prefer to learn through text, written or spoken (Graf, et al., 2007).

Sequential / Global

Sequential learners are those that have a very linear, stepwise learning and thought process. They prefer thinking in small steps as opposed to global learners who see the big picture first. They prefer to work their way back from a big picture from the top down and are generally less interested in the small details as they are the overall goals (Graf, et al., 2007).

Learning styles can impact the way individuals learn and gain actionable knowledge. When using websites as an informational resource, learning styles may lead to an attraction to a certain type of website or design.

Hypothesis 2: An individual's learning style impacts his/her visit duration.

Social Styles

An individual also has a social style profile. This is a measurement of how others describe or view an individual and how others estimate that the individual will behave in general situations. The scale combines two dimensions of behavior, assertiveness and responsiveness, to create four possible dimensions of behavior (David W. Merrill & Roger H. Reid, 1999). Merrill and Reid (1999) also remind us that there is no "best" position on their scale and there is no predominance according to race, gender, or other factor.

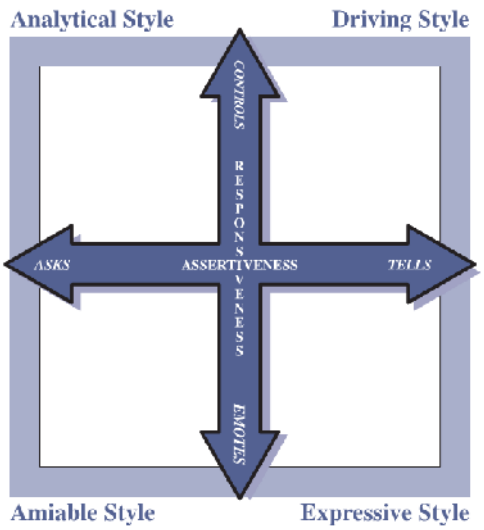
Driving Behavior

Driving behavior appears in the upper right quadrant of the social style profile. These people are characterized as being assertive, meaning they are confident and possibly even forceful with their opinions. At the same time they are also people who control their feelings. They do not show much compassion or indication that they are considerate of feelings but rather

appear stern and single-minded, telling others what they require (David W. Merrill & Roger H. Reid, 1999).

Individuals who are high in driving behavior can often be described as strong willed, independent, decisive, and even dominating and harsh. Their actions are described as swift, direct, and executed with minimum concern for caution in relationships. These people tend to work quickly and alone, without regard to a group or the whole (David W. Merrill & Roger H. Reid, 1999).

Figure 3. Merrill and Reid (1999) Social Style Dimensions.



These individuals may try to dominate social media circles or control discussion groups in an online environment. They may be seen as bossy or harsh by other users and may be quick to jump to conclusions without explaining the logic or reasoning behind their conclusions and decisions.

Expressive Behavior

Expressive behavior appears in the lower right quadrant of the profile. Individuals falling into this category are both assertive and expressive. They are confident in their opinions much like the driving style but on the other hand are much more willing to make their feelings known.

These people will openly show both positive and negative feelings (David W. Merrill & Roger H. Reid, 1999).

Expressive behavior is described by others as being ambitious, dramatic, egotistical, and friendly. In their decisions, these people tend to have a rapid reaction and attempt to involve everyone. They have a minimum concern for routine and are almost impulsive at times. These individuals tend to work best in a group and are often considered very social (David W. Merrill & Roger H. Reid, 1999).

In an online environment, expressive individuals may be the posters of polls and surveys or may seek the opinion of others openly. They are likely rapid posters to social media who may also provide a lot of detail about their thoughts, feelings, and personal relationships.

Amiable Behavior

Individuals with amiable behavior also show emotion much like expressive behaviors but are less assertive in their opinions. These people are much more likely to be agreeable and cooperative. Whereas expressive behavior tends to be a group leader, amiable behavior tends to be more of a group follower (David W. Merrill & Roger H. Reid, 1999).

Conforming, supportive, unsure, dependable, and agreeable are all adjectives to describe the general behaviors of amiable individuals. Their decisions tend to be supportive, rejecting of conflict, and involve maximum effort to relate to others (David W. Merrill & Roger H. Reid, 1999).

In social media programs, these people would be the peace-keepers. They would be the individuals who attempt to diffuse conflict and restore balance by creating an accepting group.

Analytical Behavior

The upper-left quadrant consists of individuals who ask and control. This means that they are not very assertive or forceful in their opinion but guard their emotions very closely. People with this social style tend to be very thoughtful and ask questions, gather facts, and study the situation very closely (David W. Merrill & Roger H. Reid, 1999).

People with analytical behavior tend to have slow reactions and maximum effort to organize. They are cautious and tend to reject involvement. Further, they tend to be critical, industrious orderly, and serious people (David W. Merrill & Roger H. Reid, 1999).

These may not be very social or participative people in social media websites. They may instead be careful to review all material and posts before making one of their own. They may also not participate at all but rather read through all other social media posts.

Because of the major role that social media, interactivity, and the sharing of ideas and information has on current websites, social styles may have an important impact on website use.

Hypothesis 3: An individual's social styles impact his/her website visit duration.

Personality

Personality affects every decision, regardless of type or scenario (Judge, Erez, Bono, & Thoresen, 2003) and can even create indecision in important situations simply based on various facets of personality characteristics (Page, Bruch, & Haase, 2008). In this study, the Big-Five personality traits are examined. Though there are other measures, scales using the Big-Five traits are very prevalent and are the most strongly supported (Gosling, Rentfrow, & Swann Jr, 2003; R. R. McCrae & Costa Jr, 2004; Pittenger, 2005).

Neuroticism

Neuroticism, represents an emotional state in which a person is considered unstable. Though the negative connotation associated with the term is not necessarily applicable in every case of neuroses, it is generally thought that those possessing neurotic tendencies are prone to emotional distress, depression, or possibly hostility. Researchers are careful to note that those who do score high on measures of neuroticism are not necessarily suffering from psychiatric problems or prone to them. It is simply an indication of their tendencies in interacting with situations or personality in general (R. R. McCrae & Paul T. Costa, 2010). Neurotic people may be more impatient and more affected by various treatments while interacting with websites. They may also find contempt more quickly with websites that do not quickly get them to the information they seek.

Extraversion

Extraversion in the Big-Five personality scales is very similar to the expressive behavior as defined in measures of Social Styles (R. R. McCrae & Paul T. Costa, 2010; David W. Merrill & Roger H. Reid, 1999). These people prefer the company of others and enjoy interaction with other individuals. Individuals known as introverts are those who do not possess this quality and tend to be more withdrawn and reserved, not speaking out and potentially avoiding contact with other people (R. R. McCrae & Paul T. Costa, 2010).

Introverts who are extremely withdrawn from other people may find that contact that they are missing through online interactions. They may be more likely to create identities online and fill their time with using and interacting with online environments.

Openness to Experience

McCrae and Costa (2010) define open individuals as "curious about both inner and outer worlds, and their lives are experientially richer and those of closed individuals" (p. 19). Openness indicates an acceptance to hearing new ideas and unconventional values without a snap judgment or decision. Rather, individuals with this trait will consider new ideas or different presentations before making a decision. Researchers are quick to note that openness is not the equivalence of intelligence but tends to enhance intelligence. People who are less open tend to be considered rigid in their actions and think in the same way regardless of what is going on around them. They have a narrower vision and are sometimes considered defensive (R. R. McCrae & Paul T. Costa, 2010). Open-minded individuals may be those who seek to expand their knowledge base through exposure to as much information and as many websites as possible. Closed-minded individuals may believe in one opinion or website's presentation despite evidence to the contrary.

Agreeableness

Agreeableness is also a trait that is linked to interaction with others. Agreeable people are more sympathetic and compassionate to others and do not tend to shun others or disengage them. Instead, they are generally eager to help and befriend others and are often very trusting. On the other hand, disagreeable people are those that are skeptical of others and are very competitive (R. R. McCrae & Paul T. Costa, 2010).

Though agreeableness may not be a factor in interaction with computer technology or websites, less agreeable people may tend to be suspicious of websites and less trusting of information presented. It may also be an indication of how individuals will respond to ads that contain images of other people.

Conscientiousness

Individuals who are conscientious are often considered strong willed and driven but not necessarily in a negative way. Researchers have defined conscientious people as those who are reliable and careful in their actions. They are considerate of others and repress their own desires if necessary. Conscientious people are often achievers and leaders.

Those who are not conscientious are not "lacking in moral principles, but they are less exacting in applying them" (R. R. McCrae & Paul T. Costa, 2010, p. 21). They are more interested in fulfilling their own wishes with little regard to others and without consistent focus on a goal (R. R. McCrae & Paul T. Costa, 2010).

Personality traits impact nearly every aspect of daily life, from interacting with others to processing information. When using websites and online materials, personality traits may also play a role in an individual's decisions and interactions.

Hypothesis 4: An individual's personality traits impact his/her website visit duration.

Website Design

This study suggests that personality traits govern the selection of websites and the trust that an individual puts into a website and its content. A website is a system just as any other system or program that an individual can choose to use and interact with. The decision to select, trust, or rely on a website comes from a combination of the personality factors of an individual and the appeal of the website and its design. The two aspects must match in order for a commitment to the website to be made (the website must appeal to the user's personality traits).

Websites must be designed with certain criteria and certain standards to even be considered for use (Cappel & Zhenyu, 2007). Websites that do not meet the basic standards and expectations are ignored and dismissed by the user and the search begins again for a website that

will solve the problem or provide information to answer the question at hand (Cappel & Zhenyu, 2007).

Websites must follow certain guidelines consisting of common standards and practices for them to be considered as candidates for use in decision making. Research not only suggests that there are common practices of how the information should be presented but also that the information and content are important (Cappel & Zhenyu, 2007; Karlsson, 2007; Usher, 2009; Youwei, Dingwei, & Ip, 2006).

Error-Free

Websites must be designed to be relatively error free. Errors include both deviations from standard design practices (Cappel & Zhenyu, 2007) and errors in content (Karlsson, 2007) that would cause a user to dismiss or ignore a website. The higher the number of errors, the more likely a user is to leave a website and search for another, better website with similar content (Cappel & Zhenyu, 2007).

Content

Grammatical errors, inconsistency in wording or tense, bad punctuation, and conflicting information are all examples of poor content that will cause a user to leave a website. These types of errors cause an emotional response of mistrust and discomfort for the user, leading them to be concerned about the author's reliability and competence (Karlsson, 2007; Usher, 2009). This feeling becomes exacerbated when websites are being used as research sources for topics considered critical to the user (e.g. health information) or when a purchase is pending.

Links

One major design error is improperly highlighting or showing links, menu items, and sources (Cappel & Zhenyu, 2007; Youwei, et al., 2006). If users feel that they are unable to

properly navigate a website or cannot find the links easily, they consider this a flawed design and will move on (Cappel & Zhenyu, 2007). Examples of this would be having links tied to images instead of text, menu items that are unclear or do not work, and having no clear way to get back to the main part of a site (Cappel & Zhenyu, 2007).

Adherence to web-design conventions

The World Wide Web Consortium (W3C) is an international community that develops standards and practices for the internet. They provide standards to follow for browser rendering and website design and coding. This group provides free tools so that web designers can ensure that websites are following the standards ("About W3C Standards," 2013). There are also other consortiums and conventions of large, influential tech companies such as Google, Microsoft, and Apple who strive to develop the internet and technology.

These organizations or groups of organizations produce standards and documentation on how to properly design and code a website. When these standards are followed, a website typically looks acceptable and appears as expected across most devices and browsers (Cappel & Zhenyu, 2007). However, if standards are not followed, the website may display incorrect or have elements that are out of place. This results in a feeling of frustration for the user, and they will typically take their business elsewhere (Karlsson, 2007).

Inclusion of Desired Features

Even if a website is designed properly and following standards, an individual may require more. Despite having quality information and a good design, some users may view the website as uninformative or refuse to use it because it is missing elements or features that they require (Karlsson, 2007). For example, users who are very social-media oriented may prefer a site that has elements of social sites on it and may dismiss websites that do not. Likewise a website that

contains all text and no graphics or video may not appeal to certain types of users and they may move to another site.

Reliability

Reliability of a website is related to its uptime as well as its consistency with quality content (Usher, 2009). A user must not only feel that a website contains quality, trustworthy information but must also be able to access that information at the time of their choosing (Karlsson, 2007; S. J. Simon & Peppas, 2005; Usher, 2009). Websites that crash or become unavailable or when error pages are generated while navigating through them drive traffic away and force the user to seek the information needed elsewhere.

Interactivity

Another design aspect that is considered important to many users is interactivity (Usher, 2009). Many users expect a website to have a certain level of interactivity, links or objects they can click or view, and external sources and links. Highly social and social-media oriented users are likely to expect more interactivity from websites, as are highly hands-on learners.

Many social media outlets such as Facebook strive to keep users online and engaged as long as possible. The website comScore, a large data collections agency, indicates that over 10% of user's time spent online is engaging social media such as Facebook and Twitter (comScore, 2010). It is highly likely that this trend has increased. The typical U.S. resident spends on average 400 minutes per month on Facebook alone (McGee, 2012).

There is a clear desire of web providers to generate actionable content that users want to see and want to interact with. It is the goal of those shareholders and advertisers to keep individuals there so that they can be presented with ads and links to supporters and vendors.

Content

Though it seems that content should be the most important factor of website design and appeal, as noted in the previous pages, research does not necessarily support this. Content is simply one of many design aspects that must be of a certain quality to appeal to the user (Cappel & Zhenyu, 2007; Hernández, Jiménez, & Martín, 2009; Ho & Dempsey, 2010; Hong, Thong, & Tam, 2004; Karlsson, 2007; Tan & Wei, 2006). From an information-gathering and decision-making standpoint, content is paramount (Ho & Dempsey, 2010; Karlsson, 2007). Better and more relevant content will lead to higher search results, connecting a website with more users (Hernández, et al., 2009; Ho & Dempsey, 2010). Quality and error-free content is also a major factor in the decision support systems literature (William H. DeLone & McLean, 1992), in research-based industries such as healthcare (Usher, 2009), and in simple website design (Google, 2013). Without quality content, an information system, such as a website, becomes simply another source of distraction and noise.

Given the importance of both design and content of websites to search engines as well as those using them, it is worth noting how a person's learning styles impacts their selection of or attraction to these elements. In this study, clicks on design elements such as images, video, and audio elements, as well as general recommendations based on information collected will be measured and recorded for future analysis and/or anecdotal data.

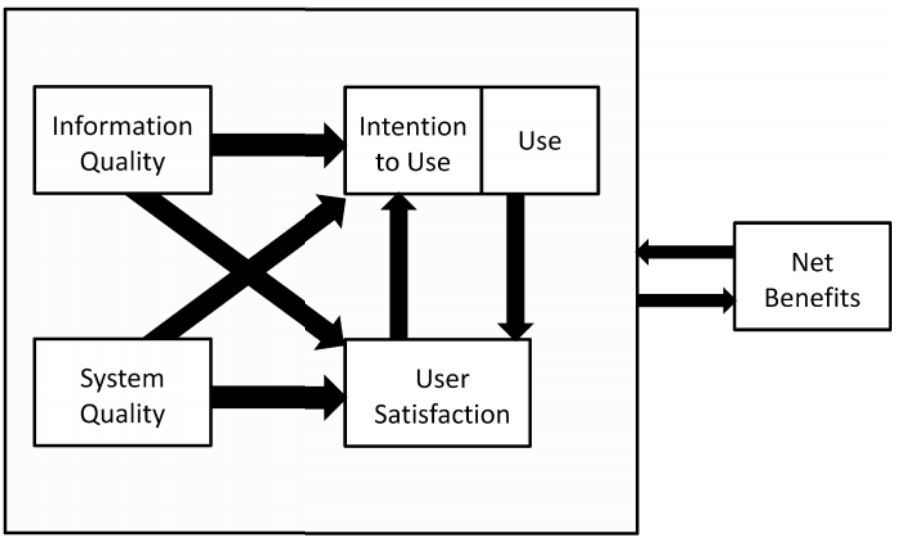
Table 3. Summary of hypotheses.

Hypothesis	**Variables Measured**
H1	Learning Styles → Visit Duration
H2	Decision Styles → Visit Duration
H3	Social Styles → Visit Duration
H4	NEO → Visit Duration

Use and Intention to Use

The Information Systems Success framework presented by DeLone and McLean thoroughly explores the possibilities of IS Success and its outcomes (William H. DeLone & McLean, 2003). Within their model, they suggest that the use or intention to use an information system depends on the quality of information in the system and the quality of the system itself (William H. DeLone & McLean, 1992, 2003). Each of these constructs has a long history within MIS research and has been shown to be important factors when dealing with systems and interactions. This works well with websites as information quality and system quality are the key factors in deciding whether or not to use a website, as discussed previously.

Figure 4. DeLone and McLean's Information Systems Success Model.



Seddon (2007) is quick to point out that use of a system must be voluntary in order for this model to function as presented. In the case of websites and information gathering through the web, he is correct. Users choose every day whether or not to interact with a website. They are not forced to do so when gathering information, so it is important to keep in mind that use and intention to use are voluntary. This is also important to support the idea that the public is often led to believe that visit duration is an important indicator of its success because it is often

one of the success metrics available. Because use is voluntary, individuals can choose whether or not to remain on a site for any length of time or leave it immediately.

Many researchers have tested the model empirically as well as validated the success constructs. Several studies provide the empirical test results of an adaptation of DeLone and McLean's model. The findings indicate strong support for relationships between perceived system quality and user satisfaction, perceived information quality and user satisfaction, user satisfaction and intended use, and user satisfaction and perceived individual impact, system usage and individual impact, information quality and system quality, and user satisfaction and system quality (Almutairi & Subramanian, 2005; McGill, et al., 2003).

Kulkarni et al. (2006) examine the knowledge management success model by applying DeLone and McLean's IS success model in their research. By transitioning and modifying the success constructs, their research built a new knowledge management success model. The empirical test for the knowledge management success model indicates most of the knowledge management components, which are substitutes for the IS success measures, are supported. Their study successfully applied and adapted the D&M IS success model to the field of Knowledge Management (KM).

Molla and Licker (2001) applied the D&M IS success model to the e-commerce environment. The researchers re-specified and partially extended the existing IS success model. They explored whether or not Customer E-commerce Satisfaction (CES) was a valid dependent variable in the e-commerce system and attempted to verify any relationships among e-commerce system quality, content quality, use, trust, and support. The e-commerce success model showed comprehensive support of evaluating each e-commerce construct by extending the D&M IS success model (Molla & Licker, 2001).

Bernroider (2008) examined the role of IT governance with regards to the success of the ERP project. For the base theory, Bernroider adopted DeLone and McLean's IS success model. Empirical results indicated that the IT governance promoted the ERP success rate.

Bradley et al. (2006) followed the previously suggested modification in addition to the IS success model by using additional antecedent variables. The authors found evidence that high-quality information technology plans are significantly affected by the IS success model. Accordingly, they empirically tested the modified model in the context of different corporate cultural types (Bradley, et al., 2006).

LeRouge et al. (2007) modified DeLone and McLean's (2003) IS success model to include use quality, which focuses on identifying and specifying indicators of the "characteristics of effective system deployment" (LeRouge, et al., 2007, p. 1290). They assumed that the concept of *use quality* significantly influences net benefits in the context of telemedicine. A summary of results support that the term *use quality* was a more appropriate construct than the generalized term of *use* found in the IS success model (LeRouge, et al., 2007).

Within the IS Success Model, it is suggested that information quality and system quality impact whether or not a user uses or intends to use a system. Both of these dimensions of systems design also impact user satisfaction. User satisfaction is also a determinant of whether or not a user will use a system and at the same time is affected by the use of a system (William H. DeLone & McLean, 2003). It is believed that satisfaction is gained from problem solving (Robbins, 2004), and thus this model fits decision makers who are using a website to gain information in order to solve a problem. Use of the website and gaining of knowledge from the website should lead to both a satisfaction and a satisfaction of knowing what they previously did

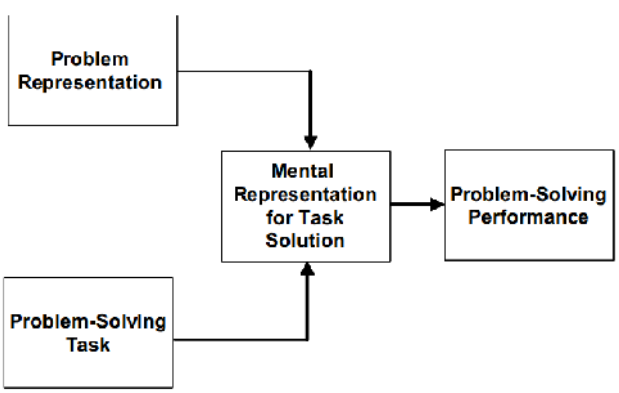
not (Bharati & Chaudhury, 2004) as well as a potential increased use of the information system itself.

Information quality and system quality are important components of this study. Because interaction with a computer system is being studied, it is important to hold these constructs constant. When the quality of an information system is poor, it leads to reduced use. Even though participants in this study are being asked to interact with a website, their satisfaction and the results of their use could be tainted and become less valuable if they were dissatisfied with the way the system was designed or if it malfunctioned at some point during their use.

Cognitive Fit

Cognitive fit theory suggests that individuals create representations of problems in their minds. The representation of the problem is developed from an individual's knowledge, experience, and other factors that make them a unique and free-thinking individual. Once a representation of the problem is established, they create another representation of the task needed to solve the problem. The person's solution is based on the skills, knowledge, and resources they possess and believe will benefit them in solving the problem (Shaft & Vessey, 2006).

Figure 5. The Cognitive Fit Model.



Once the problem representation and the solution are created and are compatible, cognitive fit is said to exist (Shaft & Vessey, 2006). This means that the individual possesses the

information and resources to solve the problem. If cognitive fit does not exist, the individual must seek assistance from another source of knowledge (perhaps another person or resource) or attempt to re-evaluate their solution to the problem (Shaft & Vessey, 2006).

A problem exists when there is a disparity between information possessed and information that is needed. Most individuals in the present time turn to the internet as a solution to this problem. The user searches for the topic of which they lack information and studies various websites in order to find a solution that they believe in and trust to fulfill their need for knowledge on the subject at hand (Ou & Sia, 2010; Sicilia, et al., 2006; Tarafdar & Jie, 2005).

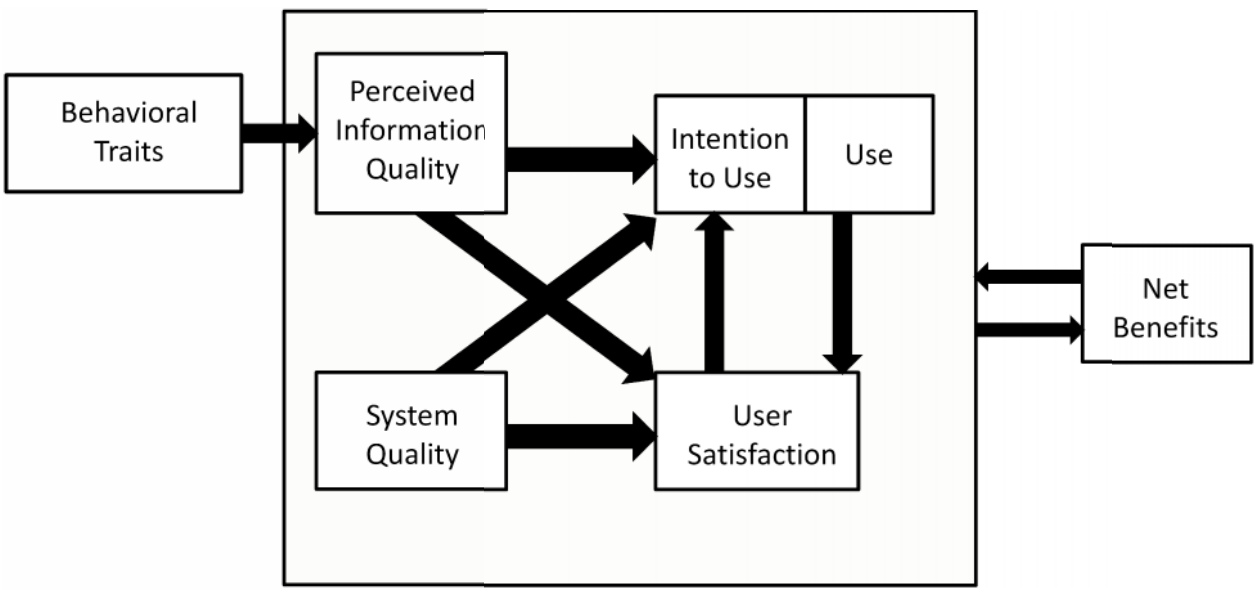
Cognitive fit is impacted by an individual's behavior and personality traits. In order to understand a problem, an individual must study it, so their learning style will come into play. Their representation of the problem will often be affected by how they view information, how they make decisions, and what type format of information they prefer.

Theoretical Model

It is believed that an individual's behavioral traits impact their use or intention to use a system (in this case a website). If the person feels that a system will not satisfy their method of learning or facilitate their method of decision-making, for example, they will seek an alternative that can facilitate their behavioral traits more completely. Failing to satisfy an individual's need for a particular content or method of presentation/learning usually results in a complete discontinuance of a system, much like failures to satisfy a desired level of information quality or system quality in the IS Success model (William H. DeLone & McLean, 2003). As with part of Seddon's (1997) argument with the IS Success Model, system use must be considered voluntary for this model to hold. In the case of internet use, users can choose from millions of websites and are by no means locked into using one website.

In addition to its impact on use or intention to use, an individual's behavioral traits (learning styles, decision styles, and even personality traits such as those in NEO) may have impacts on whether or not the person judges a website's content to be of a high quality or not. In the original IS Success Model, DeLone and McLean (William H. DeLone & McLean, 2003) present information quality as a construct in and of itself, and the present study suggests that the decision of whether or not the information presented is of a high quality is impacted by these traits.

Figure 6. Theoretical model for this research.



It is important to note that the personality dimensions measured in this study do not determine whether or not a system actually has a high information quality; it simply affects whether or not a user **perceives** that a system's information is of a high quality. For example, a highly interactive user may deem that a website with no images, videos, sound, or movement may be of a low information quality simply because they are not attracted to the information presentation (Hernández, et al., 2009; Ho & Dempsey, 2010). However, in reality, the

information presented may be identical to the information presented on another website that they prefer with large amounts of media.

The difference is the information presentation. If the information is presented in a way that they are drawn to or approve of, a user stands a much higher chance of deeming the website as useful and of having a high value (Ho & Dempsey, 2010). Thus, their intention to use the website is affected and they are likely to return when they are in need of more information about that topic.

It is also believed that system quality is independent of information quality. System quality refers to the aspects of website design discussed previously. In this case, system quality includes whether or not the website is active and functional, slow or unresponsive, easy to navigate, and designed in a way that is useful and helpful to the user (Cappel & Zhenyu, 2007; Karlsson, 2007; Usher, 2009). Visitors to a website with poor system quality may never even reach the ability to determine whether or not information quality is acceptable, may become frustrated, or may simply exit the site as soon as they deem system quality to be unacceptable.

Model Development

Figure 6 shows the model adopted for this study. Learning styles, personality traits, decision making styles, and social styles are thought to be indicators of visit duration. Because learning styles affect the types of information presentation an individual is attracted to as well as their potential to absorb and retain material (Tzu-Chi, Gwo-Jen, & Jen-Hwa Yang, 2013), learning styles may also impact the number of clicks on multimedia elements on a website. Having a large number of multimedia elements could extend the visit duration to a website if those drawn to them spend their time interacting with these elements. Table 4 shows the specific measurement aspects of each hypothesis.

Figure 7. Path model, with hypotheses.

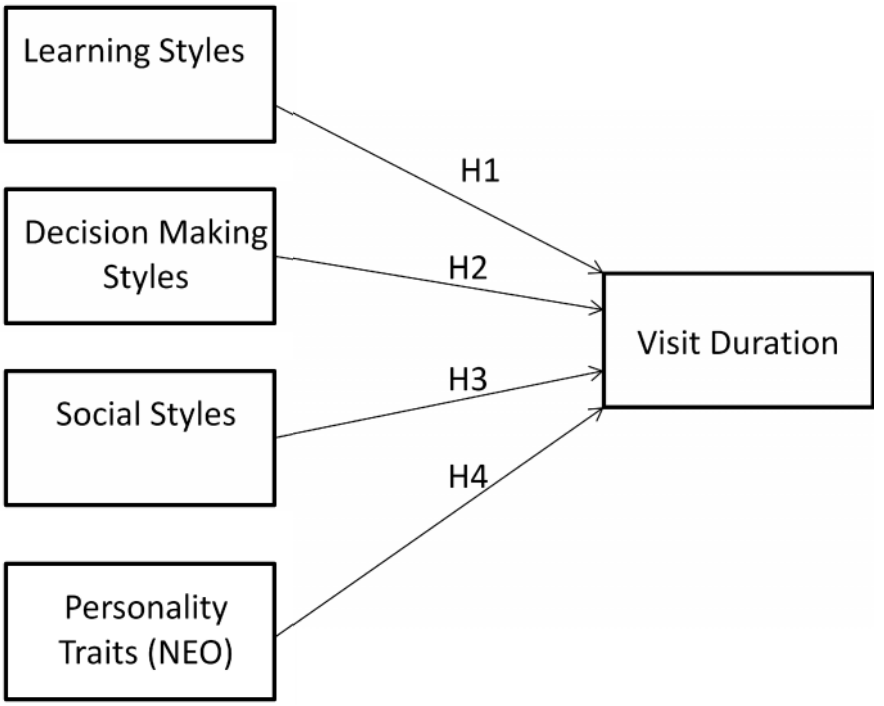


Table 4. Hypotheses measurement items.

	Predictor	Dependent Var.	Direction / Impact	Analysis Method
H1a	Active	Visit Duration	Positive	PLS
H1b	Sensing	Visit Duration	Positive	PLS
H1c	Visual	Visit Duration	Positive	PLS
H1d	Sequential	Visit Duration	Positive	PLS
H1e	Reflective	Visit Duration	Negative	PLS
H1f	Intuitive	Visit Duration	Negative	PLS
H1g	Verbal	Visit Duration	Positive	PLS
H1h	Global	Visit Duration	Negative	PLS
H2a	Perfectionism	Visit Duration	Positive	PLS
H2b	Impulsiveness	Visit Duration	Negative	PLS
H2c	Brand Recognition	Visit Duration	Negative	PLS
H2d	Planning	Visit Duration	Positive	PLS
H2e	Easily Distracted	Visit Duration	Negative	PLS

H2f	Trendiness	Visit Duration	Negative	PLS
H3a	Driving	Visit Duration	Negative	PLS
H3b	Amiable	Visit Duration	Positive	PLS
H3c	Expressive	Visit Duration	Negative	PLS
H3d	Analytical	Visit Duration	Positive	PLS
H4a	Neuroticism	Visit Duration	Negative	PLS
H4b	Extraversion	Visit Duration	Negative	PLS
H4c	Openness	Visit Duration	Positive	PLS
H4d	Agreeableness	Visit Duration	Positive	PLS
H4e	Conscientiousness	Visit Duration	Positive	PLS

This chapter presents the foundational literature for this study. Previous research has indicated that the constructs of learning style, decision making style, and social style can affect how individuals learn and process information. The literature also suggests that use of an information system is an appropriate measure of success. In terms of websites, effective use is often measured by the time an individual spends interacting with a website. Therefore, there should be an impact from the various aspects of a person's mental makeup to their interaction with a website. This study is the first to look at what a commonly presented measure of website success means in relation to a person's behavioral traits.

CHAPTER THREE

METHODOLOGY

This chapter describes the research methodology for this study. This study was open to participants of any background and skill level. The only requirement was that each participant had at least a moderate level of technical proficiency, enough to be able to use and navigate a website. The study was a task-based design in which participants were given a scenario and a specific task to accomplish. This methodology was combined with several questionnaires delivered both pre-task and post-task. A pilot study was also conducted to assess the validity of the model and instruments described in the next section.

Instrument Development

Index of Learning Styles (LS)

The Index of Learning Styles was created by Felder and Silverman (1988) to gain insight into the learning methods and tendencies of groups of students in engineering courses. They initially started with 32 diverse styles of learning and narrowed the list down to four dimensions, each placing an individual somewhere in between two extremes (e.g. visual versus verbal). The initial work and theoretical model development also helped to encourage teachers and educators to recognize different learning styles and create a more diverse classroom so that those with different tendencies could have the same opportunity to learn and develop. However, the authors caution that the index is simply a possible indicator of preference or habit, not an indicator that

an individual is incapable or unable to learn in a certain method or format. The dimensions of LS as well as a brief explanation of each is summarized in Table 5.

Table 5. Learning Style dimensions.

Dimension	Extreme 1	Extreme 2	Explanation
A-R	Active	Reflective	Active learners tend to learn best by doing, reflective by quietly listening first.
S-N	Sensing	Intuitive (N)	Sensing learners focus on facts, while intuitive learners discover relationships and possibilities.
Vs-Vb	Visual	Verbal	Visual learners focus on what they see while verbal learners focus more on writing and spoken explanations.
Sq-G	Sequential	Global	Sequential learners need linear steps while global learners take large leaps and sometimes overlook small connections.

The instrument is designed to measure an individual's aptitude toward four distinct dispositions, all indicating a preference in learning tendencies. The types of learning measured by this instrument are active/reflective, sensing/intuitive, visual/verbal, and sequential/global. A person call fall in either extreme of each category, each indicating a different disposition toward information absorption. Since their original work, it has been validated by and applied to various fields such as education and computer science (Cheng, 2014), business (Sandman, 2014), military training (Kalkan, 2011), and healthcare (Hosford & Siders, 2010). The instrument has also been used in foreign language learning as well as international studies (Felder & Henriques, 1995).

After wide acceptance of the theoretical model, Felder and Soloman developed a questionnaire based on the model. The questionnaire contained 44 items and measured the each

of the 4 dimensions of learning styles originally described in the model development (Felder & Soloman). The learning styles as developed were considered to be "stable indicators of how learners perceive, interact with, and respond to the learning environment" (Felder & Spurlin, 2005, p. 104). The questionnaire is designed with forced-choice items, each associated with the corresponding dimension. The participant must choose which of the choices he/she more closely relates to, thereby placing him/her somewhere on the continuum between the extremes in each appropriate dimension. These responses are scored to indicate whether the individual is apt to be strongly situated to one side of the dimension over another.

The same study by Felder and Spurlin examined at least 10 studies that utilized the index (Felder & Spurlin, 2005). The correlation coefficients as well as the Cronbach's Alpha coefficients were presented for each of the four scales. Each of their corresponding coefficients were favorable as expected for a model that has been utilized and examined for over 25 years. The averages of these coefficients are presented in Table 6.

Table 6. Reliability indicators for the learning styles constructs from Felder and Spurlin (2005).

	A-R	S-N	Vs-Vb	Sq-G
Test-Retest Correlation Coefficient	0.739	0.748	0.687	0.61
Cronbach Alpha Coefficient	0.57	0.71	0.62	0.51

Consumers' Decision-Making Styles (CDM)/ Impulsiveness (IM)

Various decision-making style assessments were developed from theoretical and empirical studies in order to potentially measure the possible personality characteristics that have an effect on decision outcomes. Most relevant to the current study is the Consumers' Decision-Making Styles by Sproles and Kendall (1986). This instrument was developed to create a profile of an individual's consumer style. It examines constructs such as quality seeking, brand

consciousness, price consciousness, and brand loyalty. It was validated with a sample size of 482.

The original instrument was validated and used in several international studies as well. One study (Hiu, Siu, Wang, & Chang, 2001) found very low construct reliability in brand conscious (.37) and brand loyalty (.40) but mentioned that Asian culture may perceive brands differently than American culture. However, another Asian study fully supported the research with Cronbach Alpha's above .77 (Hung & Tu, 2010).

The original instrument was used and created before the advent of the internet and really before household PCs had come into widespread use. Many of the questions were structured so that it was specific to traditional shopping at retail stores and may not have been applicable to online shopping or decision making. Wickliffe refined and re-assessed the instrument in her study in 2004 to consolidate other research utilizing the instrument as well as to bring it up to date. She developed 3 strong constructs out of the previous instrument consisting of: brand conscious, quality/trend conscious, perfectionism, and impulsiveness (Wickliffe – "confused impulsive consumer") in a 17-item questionnaire (Wickliffe, 2004). Wickliffe's updated instrument was chosen for the current study. Because of the number of constructs and behavioral traits measured in this study, brand conscious was referred to as "brand recognition" and quality/trend conscious was called "trendiness" in this study.

Wickliffe reported Cronbach alpha values for both an American sample and a Korean sample. The American sample consisted of 46 factory workers, while the Korean sample was made of 82 students. The average coefficients are presented in Table 7.

Table 7. Reported average construct reliability of the revised CDM instrument.

	Brand Recognition	Perfectionism	Impulsiveness	Trendiness

Cronbach Alpha Coefficient	0.834	0.729	0.732	0.805

An small instrument measuring impulsiveness (9 items) was included in the model as a separate and distinct instrument (Rook & Fisher, 1995). However, it was found that the items for the impulsiveness scale loaded with the impulsiveness construct for CDM both in the pilot study as well as the results for this study. Therefore, items for this scale were included under impulsiveness for CDM.

In the sample for this study, impulsiveness items factored into a two additional factors, labeled *easily distracted* and *planning*, respectively. Each of the questions in the new factor called easily distracted seemed to point to distraction and inability to focus on a task, whereas those items in the planning construct contained words like "plan my shopping trip" and "shopping lists". While these are closely related to impulsiveness, they were kept separate as indicated by the factor analysis.

Social Styles (SS)

The social styles profile is very similar to the other inventories in that it asks a series of questions designed to place the respondent at various positions within a continuum from one extreme to the other in terms of how they interact with and communicate with other people (D. W. Merrill & R. H. Reid, 1999). This was a scale developed by Merrill and Reid to examine behaviors in a psychological context. Similar to the other scales mentioned, it began with a literary and empirical review of adjective words pared down to a checklist and then eventually developed into the scale we know today through research conducted from 2001 to 2003 (D. W. Merrill & R. H. Reid, 1999; Mulqueen, 2012). The dimensions measured within this profile are driving behavior, expressive behavior, amiable behavior, and analytical behavior. This construct is developed as a quadrant of the four dimensions where each person can fall somewhere within

any of the four quadrants depending on their responses to the items. This scale was thought to be useful in that a website is simply a mechanism for communicating a company/provider's message to the potential customer.

Since its development, the social styles profile has been rolled into a corporate option sold to companies who want to better understand their employees or clients. TRACOM Group who currently owns the social styles profile touts that the idea of a social style has been researched for over 40 years and that their social styles profile has been administered to over 1.5 million people worldwide (Group, 2006). The technical report put out by the company who currently owns the scales indicates that studies indicate a high reliability through the presentation of Cronbach's alpha coefficients. They report the mean coefficients to be .77, with a reported N of 14,343 (Mulqueen, 2012). This meets the recommended .6 cut-off of Cronbach's alpha (Hair Jr., Black, Babin, & Anderson, 2010).

However, within the pilot study, the social style dimensions did not factor correctly. The reliability was extremely low and the items did not load on the constructs as originally provided by Merrill and Reid. The best Cronbach's alpha obtained using various aspects of the model was .56, which was unacceptably low for a study of this size. This scale was eventually dropped from this research as being unattainable. The hypothesis involving this scale, therefore, cannot be tested with the current sample.

NEO FFI

The NEO Five Factor Inventory is a questionnaire that attempts to ascertain what is known as the *big five* personality traits often described in behavioral research: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. This research steam comes from decades of work beginning with the identification of an analysis of personality trait

adjectives traditionally found in English literature and stemming from Jung's (1971) work with personality. Over time, thousands of these adjectives were narrowed to the five factors now commonly called the big five personality indicators (J. M. Digman, 1990; J.M. Digman & Takemoto-Chock, 1981; John, 1990; John, Naumann, & Soto, 2008).

Work on the actual instrument for the NEO traits came mostly from the work of researchers McCrae and Costa (1982; 1990, 2008) who have produced well over 50 articles related to the big five personality traits and the scale they have developed.

The version of the NEO scale chosen for this study was the NEO-FFI-3 which has been validated and tested through many years of studies and research. The original authors have validated the scales with over 12,000 respondents and have found each factor to be supported with a convergent validity of between .84 and .95 (R. R. McCrae & Costa Jr., 2008), comfortably above the accepted norm (Hair Jr., et al., 2010).

The NEO FFI 3 is a 60 item questionnaire that has been shortened from the original version in order to reduce fatigue while still maintaining the previously discussed construct validity. The constructs are structured in a continuous various format rather than a nominal grouping in order to improve reliability and interpretability. Each factor provides a scale that can indicate a very low to extremely high tendency toward that personality trait. For example, a person scoring high in conscientiousness is described as generally sensible, rational in decision making, reasonably cautious, and generally finishes tasks that are started whereas a personal scoring low in conscientiousness would be considered somewhat irrational in decision making, undisciplined, and perhaps very flippant in attitudes toward goal completion (R. M. McCrae & Costa Jr., 2010).

Recommendation and Justification

After browsing and viewing the webpages in the tasked-based design for as long as they wished, each participant was asked to make a recommendation as to which company and which product they would choose given the information they had been presented. They were also asked questions about why they would make that choice in order to provide some anecdotal explanation for potential findings. These questions were open-ended, meaning the participant could document anything they wanted, rather than lock them into a choice. This provided an excellent opportunity for a content analysis on supporting features and reasoning for the answers provided.

Participants were also asked a series of questions regarding why they spent the least/most amount of time on a particular page (automatically calculated by the task-based system). This provides some insight about why the participant found a particular page of no use or of critical importance.

Table 8. Summary table showing the constructs, subconstructs, and their sources.

Construct	**Subconstructs**	**Source**
Index of Learning Styles	Active/Reflective Sensing/Intuitive Visual/Verbal Sequential/Global	(Felder & Soloman)
Consumer Decision-Making	Brand Conscious Perfectionist Impulsiveness Quality Conscious	(Wickliffe, 2004)
Impulsiveness	Impulsiveness Planning* Easily Distracted*	(Rook & Fisher, 1995)
Social Styles	Driving Amiable Expressive Analytical	(D. W. Merrill & R. H. Reid, 1999)
NEO FFI	Neuroticism Extraversion	(R. R. McCrae & Costa Jr., 1982)

Open to Experience
Agreeableness
Conscientiousness

** indicates the construct was derived after factor analysis*

Pilot Study

In the pilot study, participants were provided with the various scales discussed as described previously via paper-based survey. They were given the decision styles questionnaire, learning style scale, and social style inventory, using the validated scales from the appropriate sources (additional instruments discussed were added for the task). Rather than provide an actual task in this stage, participants were also asked a number of questions about their intention to use certain systems. According to the theoretical basis for this study, the intention-to-use variable is an appropriate success measure of information systems (Compeau & Higgins, 1995; W. H. DeLone & McLean, 2002). Participants were asked questions about their preferences on learning and about the likelihood of participation in various learning environments. These questions attempted to gauge how an individual would behave given choices between information formats.

Participants in the pilot study were undergraduate and graduate students at a major four-year, public university. Because these questions were asked of college students, they were phrased in such a way as to apply to the classroom and/or classroom materials so that the student sample would find the questions relevant and relatable.

It was believed that even though college students are similar in age and fairly-well balanced as far as gender, there would still be some division among their behavioral styles because research has shown that everyone has different preferences for decision making (Robbins, 2004) and learning styles (James & Galbraith, 1985). There is no one set level that applies to a certain group of people but more preferences or levels per person that can vary

across various dimensions of measured personality constructs. For example a person could be highly neurotic and a very visual learner, score low in neuroticism and be an extravert who is very attracted to aural learning, or some other combination of these dimensions. Each person is different and likely has different combinations of each of the constructs measured in the study. Example intention-to-use questions include:

- If the cost were the same, I would prefer to use electronic textbooks.
- If the cost were the same, I would prefer to "attend" classes by watching pre-recorded lectures.
- Traditional classes should include forced class discussion (discussion leaders for specific questions, grade points for discussion, etc.).
- When searching online for information for a research paper on business strategy, text-based information is more valuable to me than information presented in a video.

The constructs from the pilot study factored well and showed some favorable relationships with intention to use. The social styles inventory did not have strong factor loadings in the pilot study but was included in the final study. Otherwise, intention-to-use was replaced by the actual measurement of use of the websites.

Overall Task Design

In subsequent order, the participant was given each of the instruments discussed in this paper and used in the pilot study: learning styles, decision making styles, and social styles. This information was needed to establish the user's psychological make-up and establish a baseline for their personality traits. All of their responses were logged into a database and set aside for the time being.

In order to more fully understand personality aspects of the participants, two additional scales, the NEO FFI personality inventory and the impulsiveness scale, were added to the pre-task questionnaire. Having found the impulsive aspect of decision styles to be an important factor in the pilot study, this scale was added to examine its effect on the visit duration. The impulsiveness instrument is a simple 10-item questionnaire on a Likert scale that examines the single construct of impulsive buying habits (Rook & Fisher, 1995). An example question is: "I see it, I buy it" describes me. This scale may indicate a pattern of behavior when shopping online. As expected, the impulsiveness scale items and the impulsiveness factor of decision styles loaded together.

The NEO FFI should provide some indication of the personality traits of the participants. This has been a widely-used and highly validated instrument that is often used job interviews and hiring processes, part of academic studies, and in psychological assessments (R. M. McCrae & Costa Jr., 2010). It should help to provide insight on those factors that impact selected indicators for website use. The NEO FFI is a 60-item scale which measures the big five personality traits of conscientiousness, extraversion, openness, agreeableness, and neuroticism. Questions are asked on a 7-point Likert scale and are structured so that the participant indicates the level of applicability of the statement to his or her personality.

After each participant completed the questionnaires, they were asked to wait a week so that they did not become fatigued during the task. They were then invited back to complete the rest of the study. Participants were presented with a scenario which described that they were working for a small, budget-conscious company looking for a new business telephone provider. As an employee, they were asked to evaluate several alternatives and top choices and report back a recommendation to their superiors. As a part of the task, they were instructed to learn all that

they could about each company and its offerings and told that they would be required to make a choice and recommendation at the end of the task.

Participants interacted with two mock (fully functional) websites from two opposing telephone providers – one traditional, landline service and one for VoIP (Voice over IP) internet phone. Though these pages were modeled from existing companies and live websites, the pages were altered to contain fake company data, user information, frequently asked questions, testimonials, and other distractions from the actual product information. The system also included various menus and media elements for the user to interact with. The main aspect the participants should have been interested in was the product/service descriptions and/or how their services and plans worked. Akin to this information was pricing and information on how to signup, options available, and even advertisements for additional services. The pages presented the same types of information in varying formats – audio, video, image, and text. Each site contained sufficient information so that the participant could learn about the service if they were unfamiliar. Each of the company sites contained essentially the same information for each separate product/service, but each also contained various methods of retrieving the information needed to complete the study.

There was no time limit. Participants could study the company sites as long as they wanted. When they had completed their search, they were directed to a follow-up questionnaire to gauge their level of learning and information consumption while visiting the internet sites. Participants were asked what service they would recommend. They were then asked to justify why they would make that recommendation to their company. Further, they were presented with a screenshot of the page they spent the least amount of time on and asked why. The same was

presented for the page the participant spent the most time on. This provided qualitative responses in addition to the quantitative measures.

All activities including clicks, time spent on each page, and navigational order were recorded automatically. This information was then used to ask participants about the pages on which they spent the least/most amount of time. The same information that is recorded when visiting traditional websites such as browser, operating system, and navigational order were recorded automatically.

Common method bias occurs when, as with most research, only one method of data collection is employed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In this study, questionnaires, task-based interactions, and physical observation were used and incorporated. Utilizing a multi-method data collection mechanism should significantly reduce or completely eliminate the common method bias (Pinsonneault & Kraemer, 1993; Podsakoff, MacKenzie, & Podsakoff, 2012).

System Quality

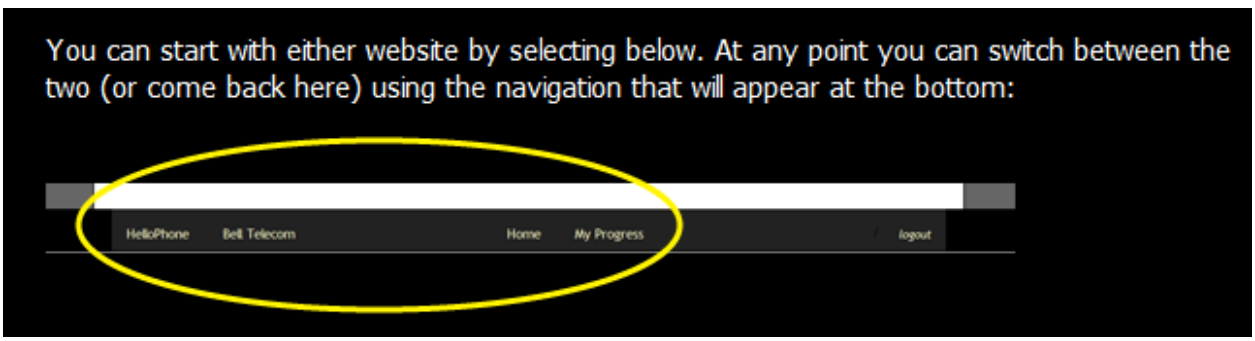
Continuing with the DeLone and McLean IS Success model (W. H. DeLone & McLean, 2002; William H. DeLone & McLean, 2003) from which this task-based study is partly conceived, system quality will be held constant. Each participant experienced the exact same system in the exact same manner. The system was website-based, so each user was able to browse to it through any web browser from any location using browser-based navigational buttons as well as menu items and links within the pages. The websites were setup so that each was self-contained, meaning each website had a full range of products and services as well as informational pages such as news and "About the Company" which were not necessarily relevant

to the task but should provide the participant with a complete website and picture of the company the website represents

Participants were able to move back and forth freely between the two competing websites and within each website as much or as little as they chose. Free choice and exploration were encouraged as a part of the task to gain as much knowledge about each company and product as possible. When participants were finished finding information, they could end their search for information at any time and continue on with making their recommendation and justifications. This amount of time spent navigating the pages and what the participant did while on these webpages was recorded and became the observed dependent variables in this study.

The system was thoroughly tested for functionality and was examined for errors before launching. This was done to eliminate the possibility of error due to website malfunction in any way. Further, the website was designed with ease of use in mind. A menu was always shown at the bottom that allowed participants to move freely without searching for or trying to learn a complex navigation system. By participating, users self-selected into a group of which internet use is a standard skill possessed by the participant.

Figure 8. Example navigation from the task pages.



Information Quality

Information quality was also the same on each site. Information format was the only piece of information that changed within the pages. Both sites contained the same types of

presentation formats as well but they were not always located in the same place on the pages. Information was checked for accuracy and correctness both in grammar and in wording to ensure the pages and information formats were consistent and accurately assessed by the user.

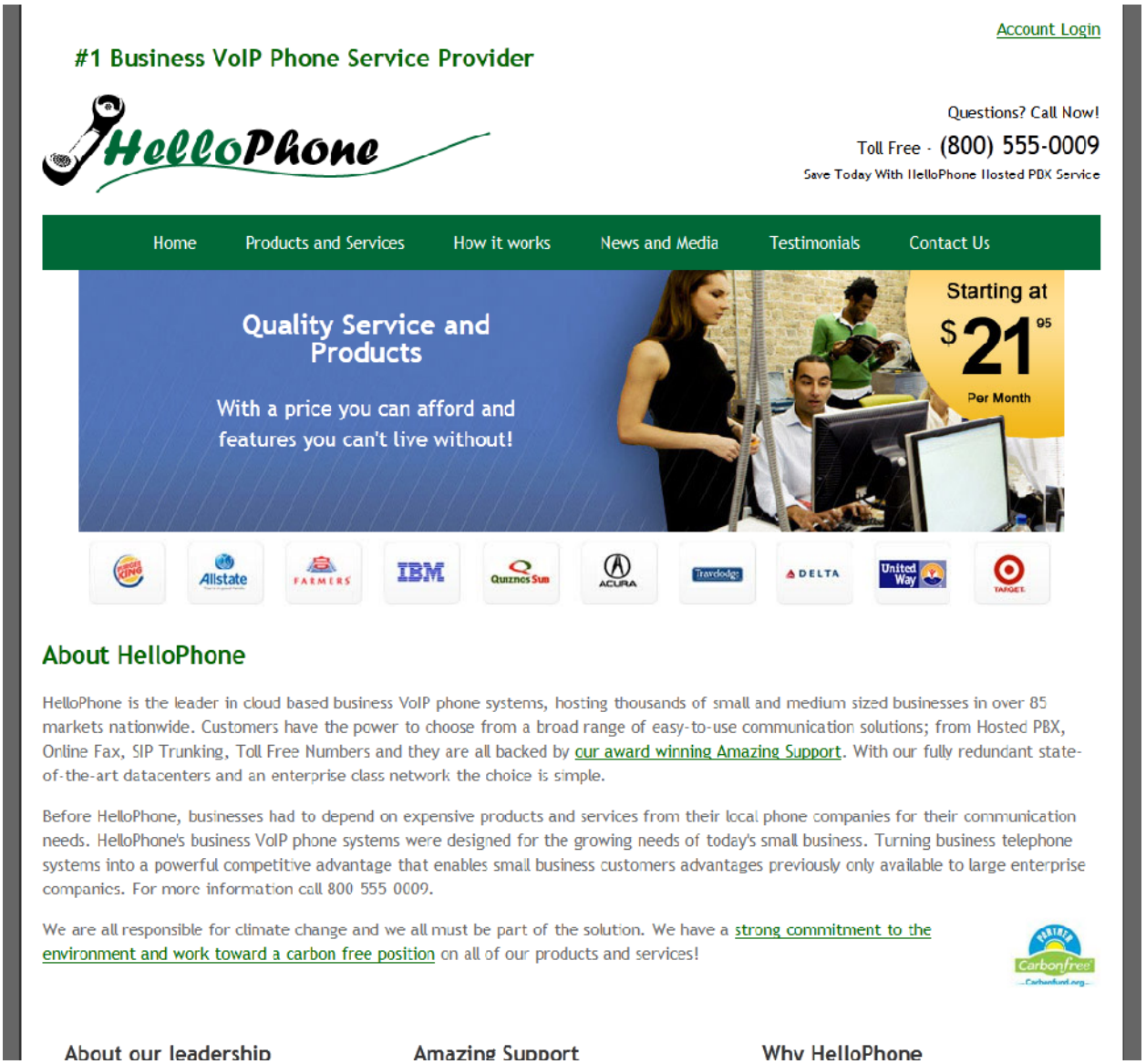
Use

In the initial scenario, participants were asked to use and interact with a website system. Each of their clicks and mouse movements were recorded regardless of whether or not they were interacting with the task-based part of the study. Because of the nature of the online questionnaires and the fact that there were often numerous opportunities to click in varying formats, each click shows a pattern of behavior from the participant. Time between pages and time spent navigating were also recorded without the participant's knowledge in order to get a full view of the participants' actions and potential thought processes as they analyzed each page. Navigation was unrestricted; each participant could visit any page within the system and could stay as long or as briefly as they preferred.

Each click and mouse movement was tracked and recorded as well. This data serves as actual use information. This information was recorded in the same method employed by website usage statistics provided through server logs or third-party services such as Google Analytics. With this information, the user's exact path through the website, how he/she arrived at the product information, and which product information format he/she spent the most time studying is evident.

Figure 9. Landline website screenshot from the task pages.

Figure 10. VoIP website screenshot from the task pages.



Participants

Given the prevalence of information technology, social networking, and mobile devices, most people living in the USA meet a minimum level of proficiency with interacting with computers and browsing websites, enough to qualify them to participate in this study. Participants were invited by email and by word-of-mouth. MIS students at several large public

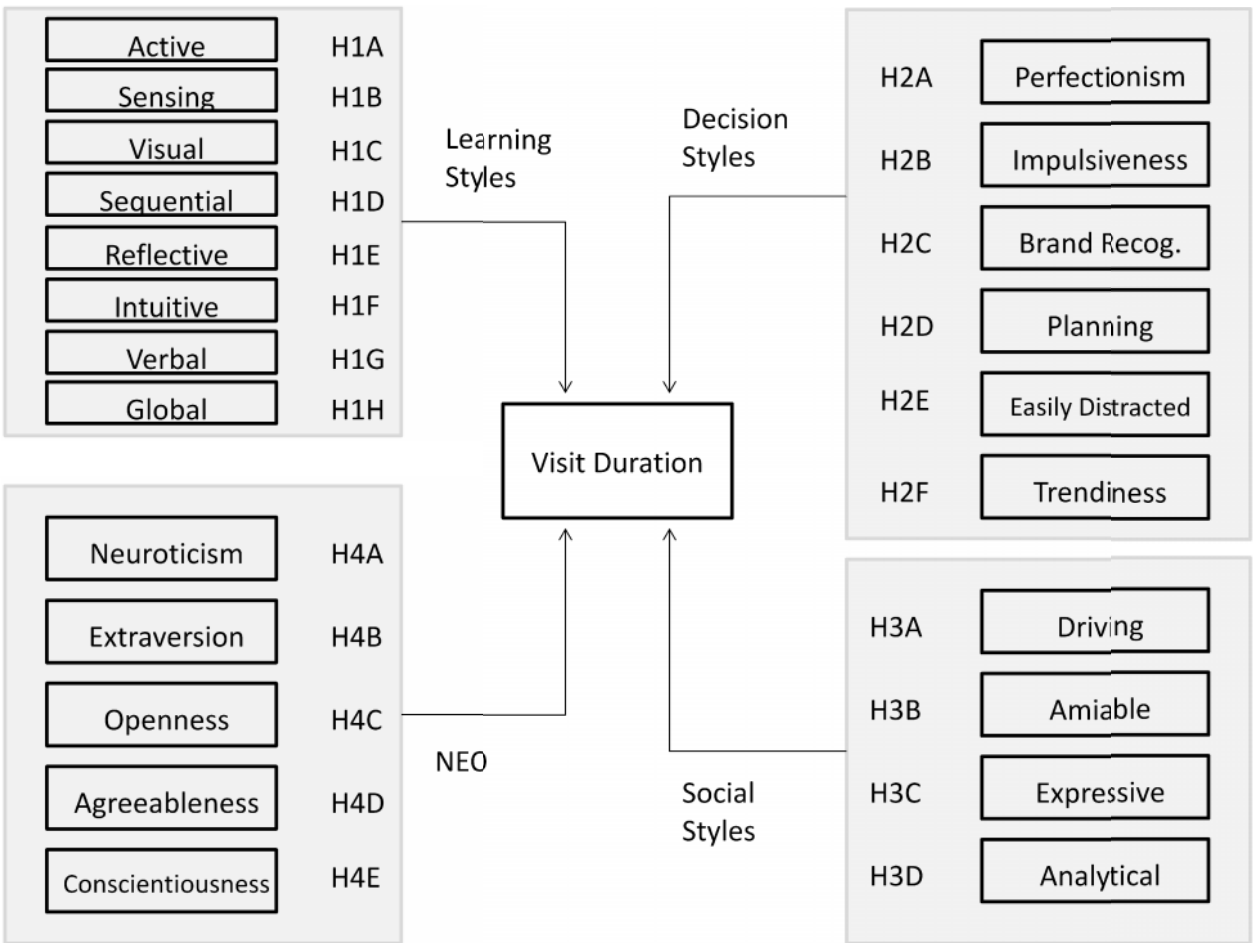
universities were specifically targeted, as well as business owners and their employees. Participants were invited via email and asked to register with a username and password. This allowed them to stop and continue their interactions with the websites, save their progress, and reduce fatigue. However, the results were not tied to a particular identifiable user account.

An incentive was offered as an option to participants in order to increase participation (Simsek & Veiga, 2001). Before ending their session, participants could select whether or not to be considered in a random drawing for an iPad 2 and a Kindle Fire. Out of the participants who agreed, the database selected two random participant IDs. Those people were contacted via email and provided with the appropriate devices.

The Model

Figure 11 shows the constructs and indicators for this study. This figure shows the four main constructs discussed above: learning styles, decision-making styles, social styles, and personality (NEO), with each of their sub constructs. Each construct is represented in the model as a reflective indicator to the dependent variable, visit duration (use). To reduce complexity for the presentation of the model, the individual construct relationship lines have been consolidated in Figure 11. Visit duration, clicks, and navigational order were collected from actual observation of behaviors and actions taken while actively engaging with the task-based study.

Figure 11. Measurement model.



Data Collection

Data collection consisted of three phases: pre-task questions, the task itself, and post-task questions. First, participants were asked to respond to the pre-task questionnaires. This created a personality profile for each participant and was recorded in a database system. A week later, they were asked to return and complete the actual task and respond to additional questions, make a recommendation, and justify that recommendation.

Targeted participants were of all ages and background. Several business classes at a major four-year institution were invited to participate. Other participants were business owners,

their employees, and various individuals who had provided their email addresses to the researcher over time or who had responded to online and paper ads and who had elected to participate to be considered for the drawing of the incentives.

Statistical Power and Effect Size

In order to determine whether or not a statistical test will correctly reject a null hypothesis or yield statistically significant results, one must calculate statistical probability (Jack J. Baroudi & Orlikowski, 1989). Effect size is one of the most important factors in statistical power calculations. The generally accepted goal for statistical power in IS research is .80 (Jack J. Baroudi & Orlikowski, 1989). With a medium effect size of 0.15 and 19 total predictors in the model, the minimum required sample size is 153 at 0.05 probability.

Demographics

In total, there were 482 participants in the study. After removing records with missing responses to questionnaires and those that were outliers, total usable records were reduced to 307. Numerous descriptive statistics were collected about these individuals such as handedness (right or left handed), gender, education level, and employment status. Additional descriptive of the participants were automatically measured in the same way that traditional web developers would record these items: web browser, operating system, and approximate geo-location of computer accessing the study.

Gender of the respondents is presented in Table 9. 165 males and 100 females participated. 42 respondents did not report their gender.

Table 9. Participant gender.

		Frequency	Percent
Valid	Male	165	53.7
	Female	100	32.6

	Total	265	86.3
Missing	System	42	13.7
Total		307	100.0

Education data was also collected. The education question was worded so that the respondents selected the most recently completed level of education from elementary to post doctoral work. Most of the respondents fell into one of two categories: completed high-school (103) or had at least a four-year college degree (132). The results of the education demographic are presented in Table 10.

Table 10. Participant education.

		Frequency	Percent
Valid	Some high school	1	.3
	High school diploma	103	33.6
	Associates (2 year) degree	36	11.7
	Bachelors (4 year) degree	107	34.9
	Masters	23	7.5
	Doctoral	2	.7
	Total	272	88.6
Missing	System	35	11.4
Total		307	100.0

Participants were also asked about their employment status. Responses ranged from full time student to full time salaried employee. Participants could also select that they were unable to work or unemployed. Most selected that they were employed at least part-time. Table 11 summarizes reported employment responses of the sample.

Table 11. Participant employment status.

Full time student, not working	18
Student, working full time	2
Student, working part time	127

Part time employed	81
Full time employed	44
Not employed / unable	4

CHAPTER FOUR

RESULTS

The model in this study was analyzed using Partial Least Squares (PLS). PLS is a regression-based path modeling technique that estimates path coefficients and partials out variance for the model and has gained great popularity and use in the IS field over the past few years. PLS can be used to analyze structural models with single or multiple item constructs (Ahuja, Galletta, & Carley, 2003; Hair Jr., et al., 2010), and is well suited to predictive applications and theory-building (Gefen, Rigdon, & Straub, 2011). With PLS, path coefficients are interpreted in the same manner as standardized regression coefficients (Gefen & Straub, 2005). PLS is unique in its ability to map reflective, formative, or mixed variables; independent variables may be continuous, categorical, or a combination of both. Reflective constructs are represented by items that share a common theme whereas formative constructs are defined by its indicators that may not share a common theme (Hair Jr., et al., 2010). The predictor and moderator variables in this study are reflective; the outcome variables are made of formative constructs. Because of the formative nature of the outcome variable as well as the complexity of the model in this research, PLS should be generally considered a superior tool over SEM or linear regression techniques.

It is generally accepted that the required sample size for PLS is 10 times the number of predictors included in the model (Hair Jr., Hult, Ringle, & Sarstedt, 2014). This model required a

minimum sample of 153. SmartPLS version 2.0 was used as the analysis program (Ringle, Wende, & Will, 2005).

Reliability

Reliability is a measure of how accurately or truly the construct or variable measures the dimension it should represent. For example, asking the same question multiple times should yield more consistent responses in measures with high reliability versus those with low reliability. Cronbach's Alpha is one of the most commonly reported measures of reliability. This indicator ranges from 0 to 1. Constructs with a score of .60 to .70 are considered to be at the absolute lowest tolerance of reliability according to Cronbach (Hair Jr., et al., 2010). Each of the constructs measured in the study had an acceptable composite reliability, all above the lowest acceptable limit of .7. The reliability indicator for each construct is presented in Table 12.

Table 12. Reliability of sub-constructs.

Construct	Scale	Cronbach's Alpha
Agreeableness	NEO	.82
Brand Recognition	CDM	.76
Conscientiousness	NEO	.91
Easily Distracted	IM	.92
Extraversion	NEO	.87
Impulsiveness	IM / CDM	.90
Neuroticism	NEO	.83
Openness	NEO	.82
Perfectionism	CDM	.80
Planning	IM	1
Trendiness	CDM	.84

Validity

Content validity is an assessment of whether or not items in an instrument properly indicate the conceptual definition to which they are purported to apply. This type of validity is generally established through expert reviews, literature reviews, and test-retest applications with multiple samples or populations (Hair Jr., et al., 2010). In this research, the scales that were included were evaluated after an extensive literature review that revealed strong empirical support and theoretical backing.

Construct validity examines the accuracy of measurement. It seeks to answer whether or not a collection of measured items adequately represents the theoretical construct. Strong construct validity provides confidence in making generalized conclusions about the population as a whole (Hair Jr., et al., 2010).

Convergent validity determines whether or not the indicators of a construct share a high proportion of variance, or, in other words, whether or not the items converge through high correlations to form a construct. Related items should show high correlations to each other. The outer loadings of PLS models indicate convergent validity if they provide a T-value of greater than 1.96 (Straub, Boudreau, & Gefen, 2004).

Discriminant validity represents whether or not the construct is truly distinct and separate from other constructs. High discriminant validity indicates that a construct is truly measuring something other constructs in the model are not (Hair Jr., et al., 2010). A primary way of examining discriminant validity is to examine factor loadings. Item loadings that produce high standardized loadings on the same construct are generally thought to represent that construct. Items are expected to have lower loading scores on other constructs. A loading of .5 or higher is

considered acceptable. A loading of .7 or higher is considered ideal (Hair Jr., et al., 2010; Straub, et al., 2004).

Cross loadings should not be present in proper factor loadings. If present, cross loadings indicate that discriminant validity is weak and that the item(s) may not be representing a single construct. An alternative test for discriminant validity is to examine AVE (average variance explained) (Hair Jr., et al., 2010).

After conducting validity tests on the constructs in the model, social styles was removed completely. Many of the items failed discriminant validity tests or did not have significant loadings on their intended constructs. It was also found that the included impulsiveness scale was highly correlated with the decision making (CDM) scale that also included an impulsiveness construct. These items were combined with the CDM items relating to impulsiveness to form one construct.

Results

Hypothesis 1, that decision making tendencies impact visit duration was not supported. None of the sub-constructs of decision making traits were significant predictors of visit duration. Hypothesis 2, which posited that learning styles affected visit duration, was not supported. Visit duration was not significantly impacted by various learning styles. Further analysis indicated that there was not a significant difference in the groups when respondents were grouped according to their strongest learning style against the dependent variable of visit duration. Hypothesis 3, that an individual's social styles impact his/her visit duration, was not testable and therefore not supported. Social styles did not factor correctly and thus was not included in the final model. Hypothesis 4, that personality traits were a significant indicator of time spent on a website (visit duration) was only partially supported. Of the five personality constructs included

in the NEO FFI, neuroticism was the only one significantly related to visit duration. Table 13 summarizes the results for each hypothesis.

Table 13. Analysis results and path loadings.

Hypothesis	Indicator	Dep. Variable	Path Loading	T-statistic	Supported
H1a	Active	Visit Duration	0.102	0.216	No
H1b	Sensing	Visit Duration	-0.397	0.502	No
H1c	Visual	Visit Duration	-0.162	0.292	No
H1d	Sequential	Visit Duration	0.213	0.539	No
H1e	Reflective	Visit Duration	0.235	0.481	No
H1f	Intuitive	Visit Duration	-0.409	0.521	No
H1g	Verbal	Visit Duration	-0.146	0.258	No
H1h	Global	Visit Duration	0.279	0.723	No
H2a	Perfectionism	Visit Duration	-0.093	1.161	No
H2b	Impulsiveness	Visit Duration	0.015	0.176	No
H2c	Brand Recognition	Visit Duration	-0.051	0.585	No
H2d	Planning	Visit Duration	-0.040	1.051	No
H2e	Easily Distracted	Visit Duration	0.092	1.365	No
H2f	Trendiness	Visit Duration	0.098	0.775	No
H3a	Driving	Visit Duration	untestable		No
H3b	Amiable	Visit Duration	untestable		No
H3c	Expressive	Visit Duration	untestable		No
H3d	Analytical	Visit Duration	untestable		No
H4a	Neuroticism	Visit Duration	-0.083	2.259	Yes
H4b	Extraversion	Visit Duration	-0.021	0.271	No
H4c	Openness	Visit Duration	-0.076	0.728	No
H4d	Agreeableness	Visit Duration	0.112	1.403	No
H4e	Conscientiousness	Visit Duration	-0.083	0.857	No

As indicated from the t-statistics presented from the PLS analysis in Table 13, this model was largely unsupported. One cannot infer that a change in a majority of the behavior traits listed in this study would impact a person's visit duration on a website. The only construct that

appears to have a significant impact on visit duration is neuroticism which will be discussed in Chapter 5.

This chapter discussed the results of the PLS and regression analysis of the data. The data met common reliability and validity standards, except the social styles inventory which was removed from the model. The factor loadings and construct validity were examined to show that all constructs were sound. All paths were also examined for significance at $p<.05$; one met this minimum criterion. Because 23 of 24 (sub) hypotheses in the study were not significant, this indicates that personality traits do not significantly impact a user's time spent on a website, a commonly reported website success metric.

CHAPTER FIVE

DISCUSSIONS AND CONCLUSIONS

This research has produced interesting results for both researchers and practitioners. This study is unique to previous studies in that it examines commonly reported website statistics such as visit duration (time spent on a website), interactions with media elements, and decision/recommendation after studying various websites in conjunction with various, common personality traits from website users. Though the results did not support the predicted outcome of the study, this can lead to some equally important conclusions, both for common IS theory and practical/business use.

Primary Findings

Practitioner materials suggest that "visit duration" is a critical benchmark of website performance (Chaffey, 2012). This number seems to have been deemed one of the ultimate benchmarks in that people have built businesses around increasing and maintaining this number (Cook, 2013; Google, 2013). It appears on practically every search report, analytics guide, and website improvement tool available (see Figure 2 for an example). The general consensus appears to be that increases in time spent on a website mean that people are learning and absorbing more information about a product or service (Nielsen, 2011). This study sought to explore the idea that visit duration might be impacted by behavioral traits such as those found in

common personality indicators and learning styles and built a task-based model to test that theory.

The results indicate that, for the most part, personality traits, including the methods by which people learn, have no significant effect on their time spent interacting with a website. Hypotheis 4a, which posited that higher neuroticism negatively impacted visit duration was the only hypothesis supported.

Though most of the hypotheses were not supported, this may actually provide useful information for practitioners and researchers. Simply put, one may conclude that the visit duration may not be as important of a website metric as purported by practitioner literature. Theoretical and empirical evidence have in the past supported continued use of an IS as an important indicator of success (William H. DeLone & McLean, 2003). This study by no means refutes those results; however, this study has not been able to provide insight into the variance observed in time spent on a website IS. It was believed that behavioral traits were responsible for that variance, but this study was largely unable to substantiate those theories.

Decision styles were thought to be an important indicator of the visit duration. Perfectionism seemed to have one of the strongest relationships with visit duration, and the sign of that relationship was negative. This indicates that a higher level of perfectionism reduces the amount of time spent on a website. A perfectionist person is likely to find or not find exactly what they were looking for and leave a website to either continue their search elsewhere or conclude the decision process. However, this relationship, even as one of the strongest constructs in decision styles, was still insignificant. There is also a negative, although non-significant relationship between easily distractedness and visit duration. A higher degree of distraction increases visit duration. These are likely the people that bounce from one page or site

to another and simply skim material or are more prone to click randomly on pages to seek information. These people may be drawn in to additional pages or content but it may simply be because they are distracted by graphics or images that have little to do with their original search.

Decision styles has been important in academic literature in explaining how and why people make the recommendations that they do, but it had no value in the model tested in this study. One may conclude based on these results that decision styles previously indicated as being significant indicators of choice are not valid when there are an infinite number of options, choices, and pages one can navigate while using the internet.

Personality traits were also thought to be an important indicator of visit duration. It is clear from this research that we cannot infer anything about visit duration even if we know a person's personality traits. It was predicted based on a review of theoretical materials that personality traits would have an effect on a person's actions on a website. For example, more conscientious people would likely spend more time carefully searching and examining pages in order to find the correct recommendation; this was not supported. Those who are extreme extraverts may grow weary of interacting with a faceless website and turn more to making a phone call or contacting a company employee directly for the information. While the direction of this relationship was supported, the relationship itself was not significant.

Neuroticism was the only construct that was shown to impact time spent on a website. Neuroticism was once thought to be neurosis, a recognized mental disorder, which can include conditions such as obsessive-compulsive behavior, paranoia, anxiety, and even phobias ("American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders," 2013). Neuroticism is distinctly separate from neurosis and is recognized as a common personality trait. Rather than being severely debilitating, it is perhaps considered odd or strange

behavior for most individuals. Neuroticism is generally characterized by moodiness, worry, high stress, and susceptible to mental disorders. Commonly, these people may be portrayed as always stressed out, threatening, finding common tasks frustrating and difficult, and self-conscious ("American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders," 2013).

Higher neuroticism lowers time spent on a website. This may be explained by individuals becoming more stressed out or frustrated the longer they interact with the website until they simply give up. It may be that the pressure of making a decision is too much for them so they simply make a decision with what information they have earlier than others with low neuroticism. People with lower neuroticism scores generally are more emotionally stable and less likely to react to stress. They may be seen as calm and are likely to be viewed as level-headed by peers. In the case of website activity, this translates to more time searching and browsing websites to perhaps learn more information and gain more knowledge for an effective decision.

Limitations

One limitation of this study is the prevalence of student participants. While a large portion of the sample indicated they did have full time employment and had completed at least a college level education, a predominance of the sample was students. While students are appropriate for this type of research as they are entering the workforce and will be making these types of recommendations and decisions (additionally, they are generally comfortable using and interacting with technology), this may reduce the applicability of the results somewhat to the population as a whole.

Another limitation of the study is that only a small portion of the complex nature of human behavior was measured in this study. There could likely be additional behavior elements or aspects of personality not explored in this study that do have an effect on visit duration or use of a website as purported in theoretical research. Further, only one behavioral trait measured showed a significant relationship to visit duration. While this relationship is clearly important, it only explains a fraction of the variance in visit duration. This research explored common personality elements that had been well supported in previous literature but were not comprehensive when considering the complexities and various factors of human behavior and methods of thinking/reasoning.

Theoretical and Practical Implications

This study could have some interesting theoretical as well as practical implications, but it may be very difficult to separate the two. It has been well supported that the use variable is an adequate measure of IS success (William H. DeLone & McLean, 2003; P. Seddon & Kiew, 2007). This has been said to mean continued use or just voluntary use in general of an information system (P. B. Seddon, 1997). Visit duration, or amount of time spent interacting with a website, is often reported as a critical success measure of that website (Chaffey, 2012; Google, 2013). Businesses and individuals fight to increase this number and keep it high, under the assumption that higher visit duration means that their exposure is increasing and that individuals are learning more about the products and services featured on the website (Cook, 2013).

After a widely supported IS Success model was introduced by Delone and McClean (1992), Seddon (1997) pointed out that it was important to consider the use of an IS voluntary. Otherwise, if use of the IS was required by a business, policy, law, or other measure, how could

one consider use or intention to use as adequate measures of success? Those IS systems where use was required would always be considered successful under this model, despite how users may feel about it or whether or not it was actually helpful. Because of the millions of search results and websites that are available, and given the fact that no average individual is required to gain knowledge or learn from any one website, it can easily be argued that use of a general informational webpage is considered voluntary.

In this task-based study, voluntary use was measured by allowing participants to openly explore a number of webpages that contained data and information necessary for them to make a decision and recommendation. Because visit duration of a website is often reported as a critical measure of success of websites (Chaffey, 2012; Google, 2013), it seems appropriate that, given a practically infinite number of results available on the internet, the use and continued use (in the form of time spent on that website) of a website (which is a form of an IS system) is an appropriate measure of success of that website. However, the interesting results from this study failed to explain variation in visit duration through common behavioral traits.

Individuals are all different in the way they learn, explore, and create knowledge (J. M. Digman, 1990). However, there are some clearly documented personality traits that individuals can self-report and that were used in this study. Those personality traits, expected to provide valuable insight into decisions made using a website, had no impact on whether a person spent a long time on a website/web page or spent a very short time on the very same page. This researcher would argue that because of that lack of relationship, there may be some argument against using "continued use" (in the form of visit duration) as measures of success of websites, as we do not entirely understand what causes the variation in visit duration.

Post-Hoc Analysis

Additional anecdotal data as well as pure observational data was collected but not explored in the study. Participants could recommend either of two companies based on the information they were seeing on the websites. One company was a traditional phone service company and the other was smaller but was offering an arguably more technologically advanced phone system. The recommendation itself had no right or wrong answer, but participants were also asked to justify their recommendation, as if they were presenting it back to their superior (as a part of the task scenario). Justification was open ended, so participants could document any reason of their choosing for recommending their preferred provider.

Recommendations were at an even split: 161 participants chose Bell Telecom (landline service) and 160 recommended Hello Phone (VoIP service). The justifications for these recommendations, however, were a lot more varied. In order to examine those justifications, a brief content analysis was conducted to categorize the responses.

Eight categories of comments were generated and are presented in Table 14, along with the total responses that fall into each respective category. The largest percentage of comments fell in the content / design category. This category represented justifications that mentioned choosing one of the companies and their products based on the information presentation format, the ease in understanding or interpreting the information, the quality of the information presented, or just that the information on the website appeared to be up to date and more modern than the alternative. Overall, 35.8% of participants felt that one website was more informative or up to date than another one; only 7.8% of participants mentioned navigational reasons or ease of finding information as the reason for choosing the company that they did. Of all the explanations and justifications provided (many participants provided multiple reasons), content and functionality reasons *relating to the websites* only made up 34.7% of total responses. The

other 65% of justifications were attributed to categories directly related to the products and services presented on the website. This is an important piece of information to this study. This percentage supports the idea that participants actually did study the websites and made an informed decision based on what they saw.

30.5% of participants mentioned that price was the primary driver in their decision, and 13.7% said that the technology behind the services/products was their justification for making the choice they did. Table 14 shows the categories derived from the analysis and the counts/percentages of responses that fell into each category.

Table 14. Totals from justification categories.

Category	**Count**	**Percentage of Total**
More Modern / Updated	115	27.98%
Price	98	23.84%
Technology	44	10.7%
References / Testimonials	37	9.0%
Features	35	8.51%
Flexibility / Options	29	7.06%
Reliability	28	6.81%
Navigation	25	6.08%
Total	**411**	**100%**

The point to this anecdotal data is to show that there is clearly an indication that learning occurred. Regardless of whether the participant spent 30 seconds or 30 minutes navigating the websites, their justifications listed logical, quality reasoning for making the decision that they did. Two respondents who may have the same learning style or personality traits could have two extremely different amounts of time spent interacting with the websites and yet reach the same conclusions.

One can easily surmise that the push for businesses to increase the visit duration may not be as practical or as important as consultants and web-experts have suggested that it is. By using methods designed solely to increase the visit duration, web designers may be pandering to the wrong group of individuals. Alternatively, they may be creating more problems by disguising, rearranging, or hiding key information that visitors were previously finding quickly on a website. People who are looking for certain information that may be difficult to find may certainly increase the time spent on a website, but this may not be appropriate and may reduce or reverse the desired effect. In an effort to increase the average visit duration, web developers may actually may be damaging their website success and having a counter-intuitive effect.

This research does raise some questions about the validity of the oft-used metric of success, visit duration of visitors to a website. Because this study does show clear indication of learning occurring at extremely different visit duration intervals, what then is the cause of the variance in visit duration from one person to the next?

Future Research

Researchers should continue to explore this topic of visit duration as a success metric for website IS. It is interesting that little variance was explained by a myriad of behavioral traits in this study. Future studies should re-examine the IS Success model as it pertains to website information systems and attempt to study whether or not conventional metrics are adequate measures of success to this IS subset. Could it be that these are a different form of those IS systems initially tested with the model that that the model is no longer applicable given the wealth of information freely available? If the average visit duration of a website is so important, future research should be conducted to determine what drives people to extend or reduce website visits.

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APPENDIX 1

Consumer Decision Making Questions

The following questions represented the CDM questionnaire and were presented on a 7 point Likert scale with responses ranging from Strongly Disagree to Strongly Agree. Because the questions were built into a website frame, they are simply presented as a list below.

- I usually buy the newest technology.
- The higher the price of a product, the better its quality.
- I keep my technology up-to-date with the changing trends.
- Nice department and specialty stores offer me the best products.
- I usually buy well-known, national, or designer brands.
- Highly advertised brands are usually very good.
- The well-known national brands are usually very good.
- My standards and expectations for products I buy are very high.
- When it comes to purchasing products, I try to get the very best.
- When it comes to purchasing products, I try to get my perfect choice.
- I make special effort to choose the very best quality products.
- I look carefully to find the very best value for the money.
- Often I make careless purchases I wish I had not made.
- I am impulsive when shopping.
- There are so many brands to choose from that often I feel confused.
- I should plan my shopping more carefully than I do.
- All the information I get on different products confuses me.
- Sometimes it's hard to choose from which stores to buy.

APPENDIX 2

Impulsiveness Questions

The following questions represented the IM questionnaire and were presented on a 7 point Likert scale with responses ranging from Strongly Disagree to Strongly Agree. Because the questions were built into a website frame, they are simply presented as a list below.

- "Just do it" describes the way I buy things.
- I often buy things without thinking.
- "I see it, I buy it" describes me.
- "Buy now, think about it later" describes me.
- As I browse an online retailer such as Amazon.com or Ebay.com, I have the urge to purchase items in addition to my specific shopping goal.
- While browsing an online retailer such as Amazon.com or Ebay.com, I have a desire to buy items that did not pertain to my specific shopping goal.
- While browsing an online retailer such as Amazon.com or Ebay.com, I have an inclination to purchase items outside my specific shopping goal.

APPENDIX 3

Learning Styles

The following questions represented the LS questionnaire and were presented radio-button or forced-choice responses, according to the original design of the instrument.

Directions

Please choose only one answer for each of the following questions. If both responses seem to apply to you, choose the one that applies more frequently.

I understand something better after I

- try it out.
- think it through.

I would rather be considered

- realistic.
- innovative.

When I think about what I did yesterday, I am most likely to get

- a picture.
- words.

I tend to

- understand details of a subject but may be fuzzy about its overall structure.
- understand the overall structure but may be fuzzy about details.

When I am learning something new, it helps me to

- talk about it.
- think about it.

If I were a teacher, I would rather teach a course

- that deals with facts and real life situations.
- that deals with ideas and theories.

I prefer to get new information in

- pictures, diagrams, graphs, or maps.
- written directions or verbal information.

Once I understand

- all the parts, I understand the whole thing.
- the whole thing, I see how the parts fit.

In a study group working on difficult material, I am more likely to

- jump in and contribute ideas.
- sit back and listen.

I find it easier

- to learn facts.
- to learn concepts.

In a book with lots of pictures and charts, I am likely to

- look over the pictures and charts carefully.
- focus on the written text.

When I solve math problems

- I usually work my way to the solutions one step at a time.
- I often just see the solutions but then have to struggle to figure out the steps to get to them.

In classes I have taken

- I have usually gotten to know many of the students.
- I have rarely gotten to know many of the students.

In reading nonfiction, I prefer

- something that teaches me new facts or tells me how to do something.
- something that gives me new ideas to think about.

I like teachers

- who put a lot of diagrams on the board.
- who spend a lot of time explaining.

When I'm analyzing a story or a novel

- I think of the incidents and try to put them together to figure out the themes.
- I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.

When I start a homework problem, I am more likely to

- start working on the solution immediately.
- try to fully understand the problem first.

I prefer the idea of

- certainty.
- theory.

I remember best

- what I see.
- what I hear.

It is more important to me that an instructor

- lay out the material in clear sequential steps.
- give me an overall picture and relate the material to other subjects.

I prefer to study

- in a study group.
- alone.

I am more likely to be considered

- careful about the details of my work.
- creative about how I do my work.

When I get directions to a new place, I prefer

- a map.
- written instructions.

I learn

- at a fairly regular pace. If I study hard, I'll "get it."
- in fits and starts. I'll be totally confused and then suddenly, it all "clicks."

I would rather first
- try things out.
- think about how I'm going to do it.

When I am reading for enjoyment, I like writers to
- clearly say what they mean.
- say things in creative, interesting ways.

When I see a diagram or sketch in class, I am most likely to remember
- the picture.
- what the instructor said about it.

When considering a body of information, I am more likely to
- focus on details and miss the big picture.
- try to understand the big picture before getting into the details.

I more easily remember
- something I have done.
- something I have thought a lot about.

When I have to perform a task, I prefer to
- master one way of doing it.
- come up with new ways of doing it.

When someone is showing me data, I prefer
- charts or graphs.
- text summarizing the results.

When writing a paper, I am more likely to
- work on (think about or write) the beginning of the paper and progress forward.
- work on (think about or write) different parts of the paper and then order them.

When I have to work on a group project, I first want to
- have "group brainstorming" where everyone contributes ideas.

- brainstorm individually and then come together as a group to compare ideas.

I consider it higher praise to call someone

- sensible.
- imaginative.

When I meet people at a party, I am more likely to remember

- what they looked like.
- what they said about themselves.

When I am learning a new subject, I prefer to

- stay focused on the subject, learning as much about it as I can.
- try to make connections between that subject and related subjects.

I am more likely to be considered

- outgoing.
- reserved.

I prefer courses that emphasize

- concrete material (facts, data).
- abstract material (concepts, theories).

For entertainment, I would rather

- watch television.
- read a book.

Some teachers start their lectures with an outline of what they will cover. Such outlines are

- somewhat helpful to me.
- very helpful to me.

The idea of doing homework in groups, with one grade for the entire group,

- appeals to me.
- does not appeal to me.

When I am doing long calculations

- I tend to repeat all my steps and check my work carefully.
- I find checking my work tiresome and have to force myself to do it.

I tend to picture places I have been

- easily and fairly accurately.
- without difficulty and without much detail.

When solving problems in a group, I would be more likely to

- think of the steps in the solution process.
- think of possible consequences or application of the solution in a wide range of areas.

Appendix 4

NEO FFI Questionnaire

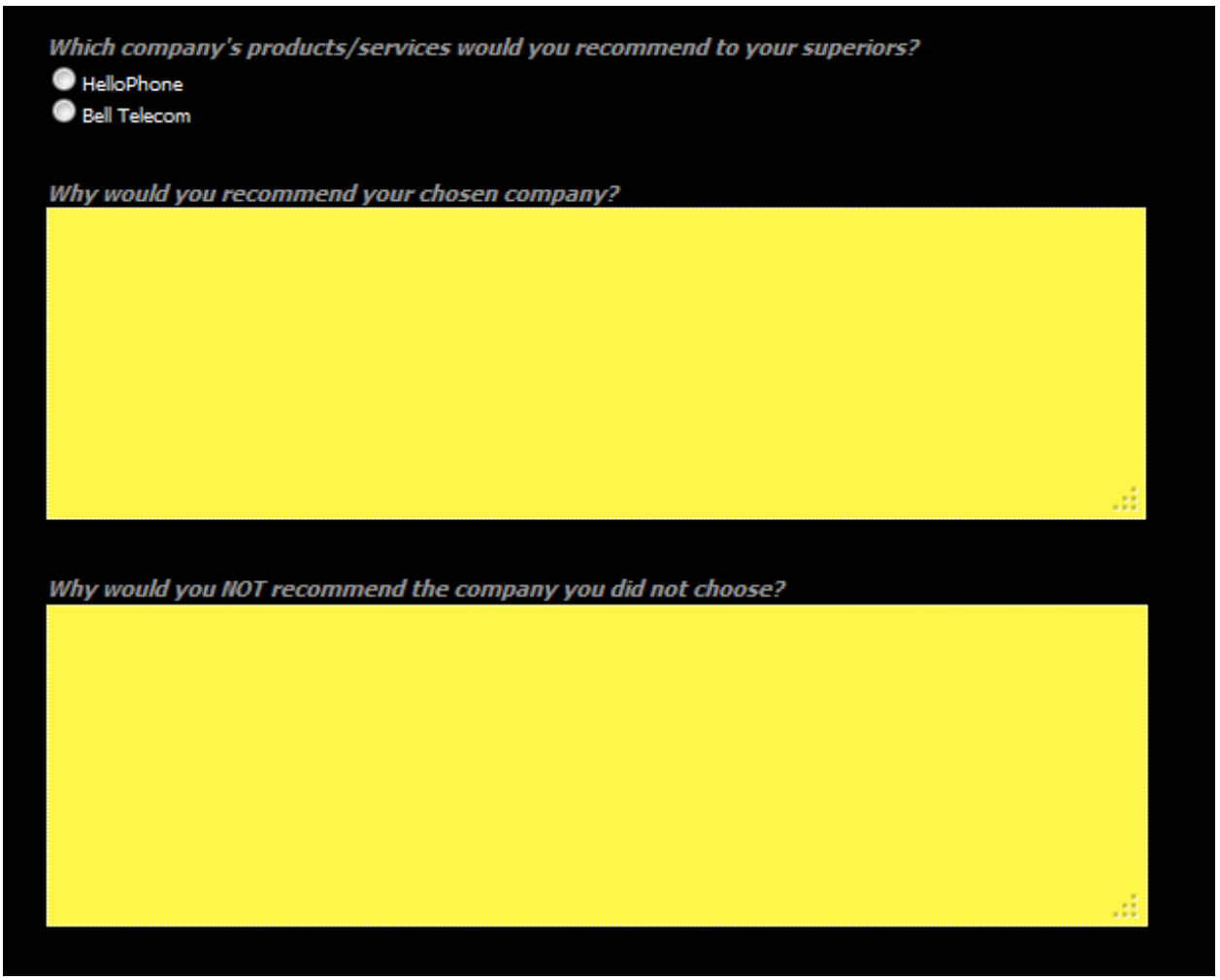
The following questions represented the NEO FFI questionnaire and were presented on a 5 point Likert scale with responses ranging from Strongly Disagree to Strongly Agree. This was specified by the PAR organization and manual. Rights to work with this version of the NEO instrument were purchased prior to beginning the study.

- I am not a worrier.
- I like to have a lot of people around me.
- I enjoy concentrating on a fantasy or daydream and exploring all its possibilities, letting it grow and develop.
- I try to be courteous to everyone I meet.
- I keep my belongings neat and clean.
- At times, I have felt bitter and resentful.
- I laugh easily.
- I think it's interesting to learn and develop new hobbies.
- At times, I bully or flatter people into doing what I want them to.
- I am pretty good about pacing myself so as to get things done on time.
- When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
- I prefer jobs that let me work alone without being bothered by other people.
- I am intrigued by the patterns I find in art and nature.
- Some people think I'm selfish and egotistical.
- I often come into situations without being fully prepared.
- I rarely feel lonely or blue.
- I really enjoy talking to people.
- I believe letting students hear controversial speakers can only confuse and mislead them.
- If someone starts a fight, I'm ready to fight back.
- I try to perform all the tasks assigned to me conscientiously.
- I often feel tense and jittery.
- I like to be where the action is.
- Poetry has little or no effect on me.
- I am better than most people, and I know it.
- I have a clear set of goals and work toward them in an orderly fashion.

- Sometimes I feel completely worthless.
- I shy away from crowds of people.
- I would have difficulty just letting my mind wander without control or guidance.
- When I've been insulted, I just try to forgive and forget.
- I waste a lot of time before settling down to work.
- I rarely feel fearful or anxious.
- I often feel as if I am bursting with energy.
- I seldom notice the moods or feelings that different environments produce.
- I tend to assume the best about people.
- I work hard to accomplish my goals.
- I often get angry at the way people treat me.
- I am a cheerful, high-spirited person.
- I experience a wide range of emotions or feelings.
- Some people think of me as cold and calculating.
- When I make a commitment, I can always be counted on to follow.
- Too often, when things go wrong, I get discouraged and feel like giving up.
- I don't get much pleasure from chatting with people.
- Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.
- I have no sympathy for beggars.
- Sometimes I am not as dependable or reliable as I should be.
- I am seldom sad or depressed.
- My life is fast-paced.
- I have little interest in speculating on the nature of the universe or the human condition.
- I generally try to be thoughtful and considerate.
- I am a productive person who always gets the job done.
- I often feel helpless and want someone else to solve my problems.
- I am a very active person.
- I have a lot of intellectual curiosity.
- If I don't like people, I let them know it.
- I never seem to be able to get organized.
- At times, I have been so ashamed, I just wanted to hide.
- I would rather go my own way than be a leader of others.
- I often enjoy playing with theories or abstract ideas.
- If necessary, I am willing to manipulate people to get what I want.
- I strive for excellence in everything I do.

APPENDIX 5

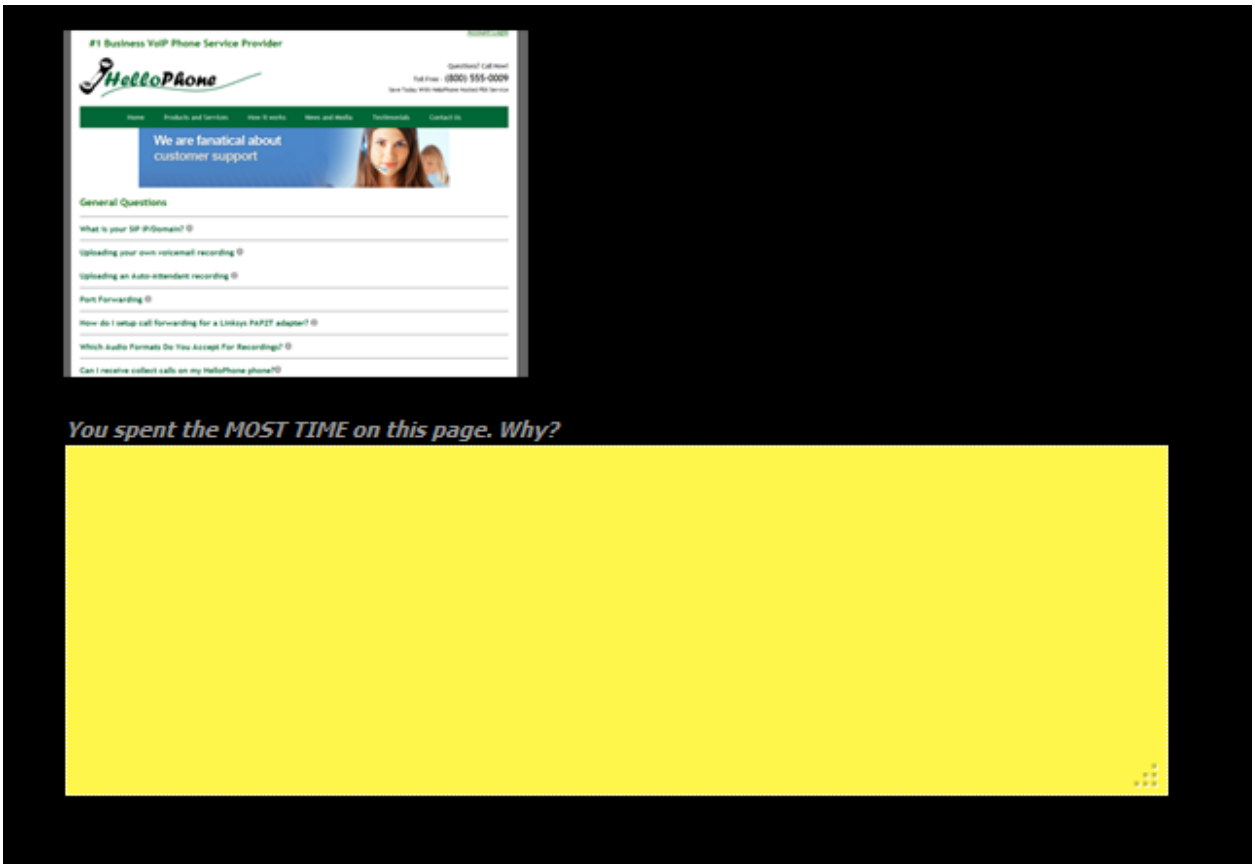
Recommendation and Justification



APPENDIX 6

Justification - Most / Least Pages

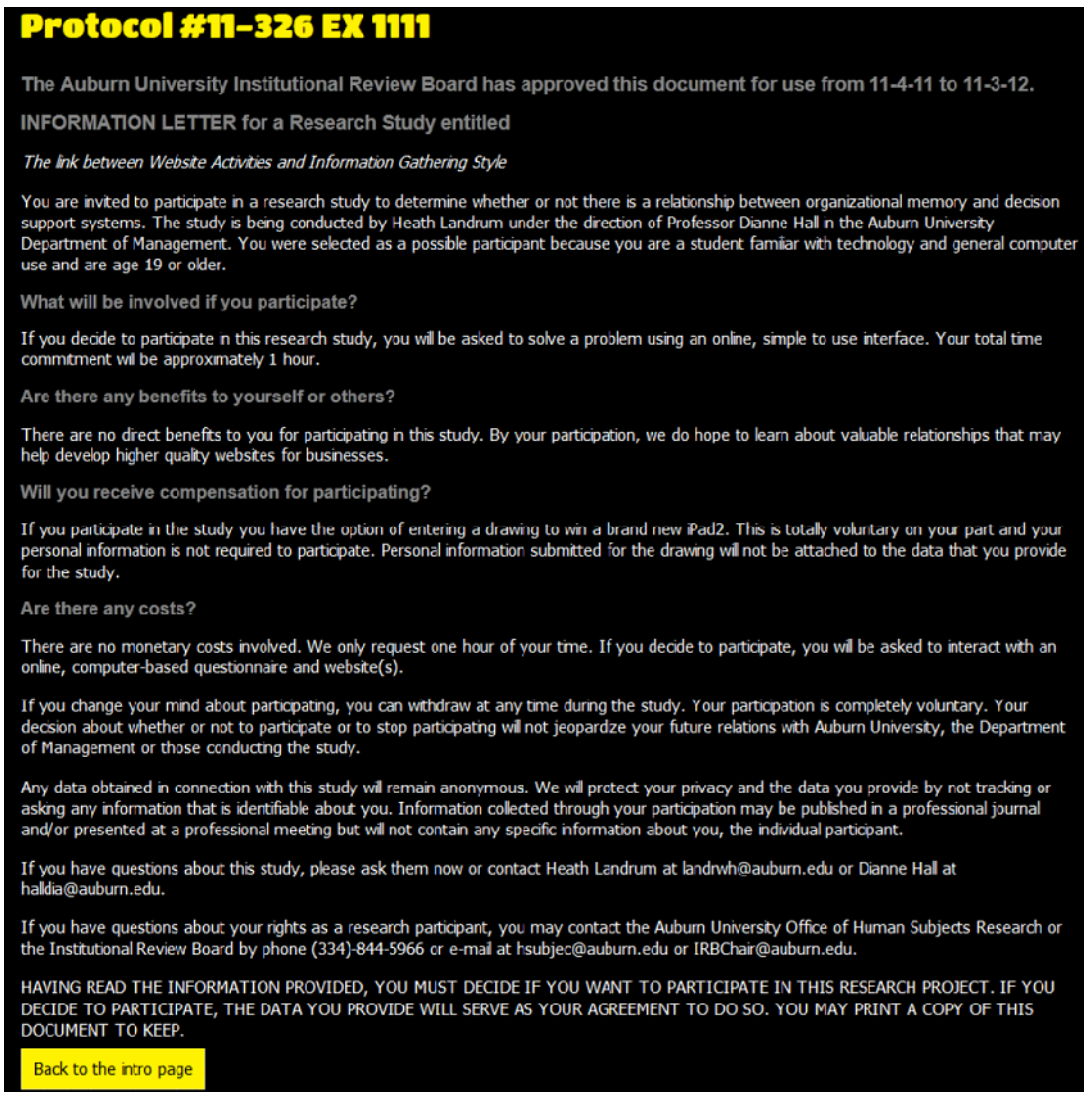
Participants were shown an image of the task pages that they spent the most and the least amount of time on, respectively and asked why.



APPENDIX 7

Institutional Review Board Approval

The IRB approval and information letter was available in both online and downloadable (as a PDF) format. This is a screenshot of the online version.



Protocol #11-326 EX 1111

The Auburn University Institutional Review Board has approved this document for use from 11-4-11 to 11-3-12.

INFORMATION LETTER for a Research Study entitled

The link between Website Activities and Information Gathering Style

You are invited to participate in a research study to determine whether or not there is a relationship between organizational memory and decison support systems. The study is being conducted by Heath Landrum under the direction of Professor Dianne Hall n the Auburn University Department of Management. You were selected as a possible participant because you are a student familiar with technology and general computer use and are age 19 or older.

What will be involved if you participate?

If you decide to participate n this research study, you will be asked to solve a problem using an online, simple to use interface. Your total time commitment wil be approximately 1 hour.

Are there any benefits to yourself or others?

There are no direct benefits to you for participating in this study. By your participation, we do hope to learn about valuable relationships that may help develop higher quality websites for businesses.

Will you receive compensation for participating?

If you participate in the study you have the option of entering a drawing to win a brand new iPad2. This is totally voluntary on your part and your personal information is not required to participate. Personal information submitted for the drawing will not be attached to the data that you provide for the study.

Are there any costs?

There are no monetary costs involved. We only request one hour of your time. If you decide to participate, you will be asked to interact with an online, computer-based questionnaire and website(s).

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. Your decision about whether or not to participate or to stop participating will not jeopardze your future relations with Auburn University, the Department of Management or those conducting the study.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not tracking or asking any information that is identifiable about you. Information collected through your participation may be published in a professional journal and/or presented at a professional meeting but will not contain any specific information about you, the individual participant.

If you have questions about this study, please ask them now or contact Heath Landrum at landrwh@auburn.edu or Dianne Hall at halldia@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. YOU MAY PRINT A COPY OF THIS DOCUMENT TO KEEP.

Back to the intro page