UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

WEBSITES ARE CAPABLE OF REFLECTING A PARTICULAR HUMAN TEMPERAMENT: FACT OR FAD?

Mini-dissertation by

ANNATJIE THERON

(92040757)

submitted in partial fulfilment of the requirements for the degree

MASTER OF INFORMATION TECHNOLOGY

in the

DEPARTMENT OF INFORMATICS

SCHOOL OF INFORMATION TECHNOLOGY

of the

FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

UNIVERSITY OF PRETORIA

Supervisors: Prof C. de Villiers and Prof J. Cronje **June 2008**

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

ABSTRACT

This study suggests that it is possible to classify websites as either extrovert or introvert and logical or emotional in style, impact and appearance. Both the extraversion/ introversion and logical/emotional dichotomies are major descriptors in the character typology devised by C.G. Jung and extended by others. Apart from the dichotomies mentioned above, Jung's typology also makes use of various emotional characteristics of human beings as descriptors of temperament or character. The study suggests that it is useful to identify websites in terms of the descriptors that Jung and others propose, and that different websites will display various "temperamental" differences that are as important for website design as is a clear understanding of the temperaments of its target users. By taking account of the most common temperamental differences in websites, it should be possible to maximise the efficiency and appearance of different kinds of websites such as those created for government agencies, banks, online shopping, social networking and search engines.

OPSOMMING

Hierdie studie kom tot die gevoltrekking dat 'n spesifieke menslike temperament aan 'n webblad toegeken kan word.; 'n Spesifieke temperament kan toegeken word as gevolg van die identifikasie van spesifieke introvert en ekstrovert eienskappe binne die webbladsye. Meer as net die identifisering in die introvert/ekstrovert dimensie, is dit ook moontlik om spesifieke emosionele en logiese eienskappe te identifiseer binne die genoemde webbladsye. Die kombinasie van die twee dimensies van temperament, lei dus tot die identifisering van 'n temperament soortgelyk aan die van 'n menslike temperament per individuele webbladsy getoets. Bo en behalwe die bogenoemde, het die studie ook gevind dat daar gelyksoortige resultate bespeur is in webbladsye met soortgelyke funksionaliteit en aanwending, verdeel in kategoriee soos regeringswebbladsye, bankwebbladsye, aanlyninkopiewebbladsye, sosialenetwerkewebbladsye en soekenjins.

KEYWORDS: temperament, personality, human-computer interaction, user interface design, website design, anthropomorphism, Carl Jung, MBTI, IT, website personality

1. Chapter 1 – Introduction and Problem Statement

"To begin, begin."

- Peter Nivio Zarlenga

1.1 Introduction

As machines and technology perform more and more functions in a our lives, more and more people are beginning to wonder exactly what kind of effect these machines have on our lives and whether the impact that they exert is benign or deleterious. The Internet alone, for example, has, in a very short space of time, revolutionised the way in which many people perform their jobs. Innumerable interactions and transactions that were originally performed face-to-face or by means of letters and other "cold" forms of communication, now take place on the Internet. This has resulted in an exponential proliferation of websites for businesses, organisations, agencies and individuals. Since so many of the interactions that previously took place in face-to-face situations now take place on faceless websites, it is legitimate to question the effect that websites have on the personalities and temperaments of those who participate in them. So many of the business and activities that previously used to take place between two or more human beings now take place between one human being and a particular website. In these circumstances, it becomes a matter of legitimate concern to inquire into the effect that websites have on those who use them.

Since an increasing number of people spend more and more time online, it becomes a matter of concern for us to know exactly how human beings experience the websites with which they interact. The fact that human beings act and react in terms of their personal understanding and perceptions of other human beings and situations, may lead us to hypothesise that they also experience websites unconsciously as metaphorical human beings with temperamental characteristics as varied and predictable as those of real people. If this is indeed the case, then it has particularly important implications for

website design. If human beings do in fact react unconsciously to websites are as though they were human beings, then it becomes necessary for website designers to incorporate whatever elements of temperament or human personality into the design of the website that will maximise the effectiveness of the website for its intended users and owners.

Before exploring such a hypothesis, it is necessary first to have a clear understanding of how the Internet functions as a medium of communication between the website and the individual user. Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts, and Wolff (2000) note that the first mention of a globally interconnected set of computers, which was then referred to as a "galactic network concept", occurred in 1962 (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts, and Wolff, 2000). Transmission Control Protocol/Internet Protocol (TCP/IP) first made its appearance in September 1973. By 1985 the Internet had become a well-established technology supporting a broad community of researchers and developers. In October 1995, the term "Internet" was officially accepted (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts, and Wolff, 2000). At the time of writing (2008), the Internet and the World Wide Web have, in developed countries at least, penetrated into every corner of our human existence, making it difficult to imagine life without it. The technology and software that people use to access the Internet and to make it effective are subject to such rapid improvement and modification that it is difficult even for IT professionals to remain completely up-to-date with all the latest developments in their field.

According to Kraut, Kiesler, Boneva, Cummings, Helgeson and Crawford (2002), it is the quality of our online relationships that determine whether or not we will have a good experience of the Internet. The measure of whether the Internet makes a positive or negative social impact on its human users depends to a large extent (1) on the quality of the relationships that people experience online, and (2) on what it is that human beings are prepared to forgo in order to spend such valuable amounts of time online. The extent to which human contacts that were previously face-to-face have now been replaced by online communications mediated through a webpage gives us some indication of the

extent to which the online environment has become central to the lives of affluent people in the contemporary modern world.

Kraut, Kiesler, Boneva, Cummings, Helgeson and Crawford (2002) use two models to explain the social impact of the Internet and the relationship that exists between extraversion, social support and Internet use. The first model predicts that Internet users who are highly sociable and who already operate within an established network of social support will obtain greater social benefits from using the Internet. The second model predicts that individuals who are introverted and who lack an established network of social support will be the ones who will benefit most from Internet usage. The contradictions between these two models suggest that it is probably not the Internet itself *per se* that confers these benefits, but rather the particular nature of the *websites* on which users spend time that determines the impact that they make on users. What is important in such an analysis is whether the websites that are being used are *introverted* or *extroverted* in terms of the typology proposed above, and the effect that such qualities would have on those who use them.

What may happen in such circumstances is that the user of a website subjectively and unconsciously reacts to the particular human qualities that the website projects. In other words, a user intuitively senses the " human being" that the website embodies, and responds to that metaphorical human being as he or she would respond to a similar flesh-and-blood person. The user then reacts to that imaginative entity (the website-as-human-being) in the same way that he or she would react to a living person in a face-to-face encounter, and that produces behavioural and attitudinal changes in the user. If this is true, then websites are far more important than the value-neutral places that some may believe them to be. If indeed human beings do experience websites in the same way that they experience other living human beings, then the implications for website designers and users become far more important.

Although human beings do not consciously attribute human qualities to computers or envisage websites as other human beings, the research conducted by Nass and Moon (2000) offers clear evidence that individuals unconsciously apply various human social rules and expectations to computers and the experiences that they have while using them. The findings of Nass and Moon (2000) led me to undertake a survey of the available literature about anthropomorphism so that I would be in a better position to understand and analyse the implications of this research. If the conclusions reached by Nass and Moon (2000) are indeed true, they support the main hypothesis of this study, namely that users of computers and the Internet routinely (but unconsciously) attribute a whole range of human characteristics to the Internet and to the various websites and virtual situations that they encounter on the Internet. In pursuance of my objective, I also examined some of the available literature about temperamental types so that I would have a clear understanding of the concept of human temperament and would be able to assess the implications of such an understanding for my hypothesis.

As a result of the literature studies that I undertook, I was able to create a questionnaire that I then administered to a small sample of participants selected on the basis of convenience. This questionnaire utilised Jung's typology of human temperament, and its purpose was to determine the extent to which the participants in the research were able to identify human temperamental qualities in websites – thereby also incidentally providing further evidence for the anthropomorphising tendency of the human mind suggested in the research of Nass and Moon (2000). The questionnaire also sought to determine how those who responded to the questionnaire would react to certain variations in website design. In creating this questionnaire, I made extensive use of the thesaurus approach. The thesaurus in question (WordWeb, 2005) offered me complete sets of words that I could use for distinguishing between one kind of temperament and another.

In order to explore the implications of my hypothesis more thoroughly, I also examined the available literature on human-computer interaction and the principles that govern interface design (and, by implication, website design) as part of the prelude to

constructing the hypothesis and the subsequent experimental work. At that stage of the study, I felt that it would be possible to determine the implicit metaphorical temperament of any given website as well as the role that various technological and interface features (such as the application of colour) would have on a potential human user.

In studies of the breadth and depth of social responses, "personality" of computer wares were found to no longer be the "holy grail" of artificial intelligence, but accessible through the tendency of users to make premature cognitive commitments to generate strong personality effects through simple means (Nass and Moon, 2000). The implication of this being that where previously it was only acceptable to refer to matters such as machines having personality in the context of "characters" built through artificial intelligence tools, it is now a matter of personality traits possibly being something much more subtle and far less technical, thus opening the field of study up to the social sciences. In order to achieve a clear understanding of the effect of this theory on my hypothesis, I also undertook a literature survey into the topic of website personality.

The research approach and methodology that was used to conduct this study includes a mixed method approach to the research undertaken from more than one point of view. The research itself utilised a combination of qualitative and quantitative research features in the context of a case study, and the data was generated by means of questionnaires and interviews with the participants who were selected for the study. The data from the questionnaire was analysed and conclusions of a qualitative and interpretive nature were drawn, and these conclusions were then integrated with the data that had been gathered from the interviews. The empirical data thus generated by the processes described above was complemented by a background study of the available literature on the topic of website temperaments. By synthesising this data into a coherent whole, I was able to reach conclusions about the validity, importance and application of the research objective.

The study commences with an examination of various ideas and hypotheses that are designed to emphasise the importance of this topic and its potential use in practice. The

limitations of the study are found in the size of the sample of participants that was used, and the limitations of the website sample. The type of sampling method that is used in this research (convenience sampling) is not considered to produce statistically valid results. It would be mistaken, in view of these limitations, to regard this study as anything other than a preliminary attempt to interest the research community in an area of research that has the potential to offer practical advice and guidance to website designers, the deeper meanings and implications of such designs, and the unconscious effects that website designs have on those who encounter them.

1.2 Problem Statement

The objective of this research is to establish whether the characteristics that are commonly attributed to human temperament (in terms of the typology used in the study) can be ascribed to websites in accordance with the emotional/logical and the extrovert/introvert dimensions of human temperament that were postulated in the typology of C.G. Jung that is used in the study. If this is found to be possible, it should be possible to associate, connect or match particular human temperamental characteristics with the appearance and function of specific websites, and therefore to maximise the effect intended by the website designer on potential users.

1.2.1 Research Question

The main research question that needed to be answered by this study is:

"Are websites capable of reflecting a particular human temperament?"

The subsidiary research questions that the author devised to arrive at an answer to the main research question were:

- **Can it be shown that websites exhibit introvert/extrovert characteristics?**
- **Can it be shown that websites exhibit emotional/logical characteristics?**

1.3 Summary

In this chapter, the reader was introduced to the concept of human temperament and its possible implications for websites and for various matters relating to their design and function. What is particularly important to this research is the topic of how human beings interact with machines in general and with the Internet and websites in particular. After a general introduction to some ideas pertaining to this study, the problem statement that determined the shape and purpose of the research was defined. The objective of the research, namely to investigate whether it is possible to ascribe typical human temperamental characteristics to websites, was then stated. The next chapter will deal with the background to the study and the literature survey that enabled the concepts that are used in this study to be more carefully defined, and, by extension, the shape of the research that was undertaken to provide answers to the research questions.

1.3.1 Document Map

Chapter 1 mentions the concept of human temperament and its possible significance and application in the Information Technology environment. This is then followed by the problem statement. Chapter 2 expands upon the concepts and issues that were introduced in Chapter 1, and explains how the background study and a survey of currently available literature about the concepts clarifies the terms of the study and the research. Chapter 3 discusses the research approach and methodology that are used in this study. Chapter 4 reviews and describes the case study itself, how it was conducted, the way in which the questionnaire was administered to the participating sample, the interviews and what they produced, and, finally, the data that emerged from the research and the conclusions to which they gave rise. Chapter 5 presents a summary of the research and contains an evaluation of the research methods and procedures. Chapter 5 concludes with suggestions for further research and some concluding recommendations.

2. Chapter 2 –Theoretical Scope and Literature Study

"Temperament lies behind mood. Behind will, lies the fate of character.
Then behind both, the influence of family, the tyranny of culture; and
finally the power of climate and environment, and we are free,
only to the extent we rise above these."
– John Burroughs

2.1 Introduction

This chapter presents the findings of the literature study that I undertook to achieve an in-depth understanding of the concept of human temperament as it is defined in the typology of C.J. Jung and of whether it might be possible to analyse websites in terms of the metaphorical human temperaments that they project. In the following section, I will present a short overview of the temperamental hypothesis devised by Carl Gustav Jung, which is the one that I selected for the purposes of this study. In his idiosyncratic theory of human personality, Jung made various predictions about the way in which personality is determined by temperament, and how these two concepts are inextricably related. In addition to describing the way in which Jung portrayed personality and temperament, I will present what the literature survey has to say about the role that anthropomorphism plays in the way in which human beings perceive the world around them. The term *anthropomorphism* will also be defined and explained later in this chapter.

After that, I will introduce, describe and comment on the topic of human-computer interaction and various matters that affect the design of the user interface because all these fields of study are directly relevant to the outcome of this study. In conclusion, I will describe and address the concept of *website personality* in an attempt to establish the validity of my claim that such website personalities do indeed exist and my subsidiary claim that website personality is the key to identifying the particular human temperament projected by a specific website.

2.2 *Carl Gustav Jung – The Originator of the Theory of Personality Types*

"To be normal is the ideal aim of the unsuccessful."
– C.J. Jung

Carl Gustav Jung, who is generally regarded, along with Freud, as one of the three great pioneers of modern psychology in the West, was the founder of that particular school of psychology that is called analytical psychology. Jung evolved an elaborate theory of psychological typology that classified the dominant functions of the human mind as extroversion and introversion, in addition to thinking, feeling, sensation, and intuition. He referred to these qualities as *psychic functions,* and he expressed the idea that it operates in each one of us in terms of a unique "personal equation" that reflects our distinctive human nature and that influences how we as individuals approach all matters that affect our outer and inner worlds (Fordham, 1953).

Jung was of the opinion that people are different in quite fundamental ways, even though we are all affected in varying degrees by the same human instincts and drives. While instincts are basic to human nature, what is really important is how people behave and interact in the social contexts in which they find themselves. Because each human being habitually reacts to the world and to other human beings in idiosyncratic and characteristic ways, it is possible to define human personality in terms of these repetitive and predominant impulses, desires, hopes and preferences (Keirsey, 1998). Jung's theory of psychological types classifies people as predominantly **choleric**, **sanguine**, **melancholic** or **phlegmatic** – terms that are derived from the mediaeval theory of humours that was in turn inherited from the ancient Greeks and Romans.

Boeree (1997) notes that Jung extended his personality typology by postulating that all people can be located in terms of personality on a theoretical continuum between introversion (at one polarity) and extroversion (at the other polarity). It was Jung's work in this regard that popularised the terms "introverted" and "extroverted" in the lexicon of

the English language. Jung's theory of personality also familiarised people with the idea that the balance of forces within an individual personality cause people to act and react in distinctive ways or in terms of what he called *personality types* or *functions*. An accessible example of such types is the dichotomy between people who habitually react *emotionally* rather than *logically* to life. The dominant function in the former group is the emotional nature, while the dominant function in the latter group is the thinking or rational function. Jung observed that individuals were invariably either controlled by their thinking function or their feelings, and he devised methods of determining the dominant function in the personality. These insights have, of course, been revised, refined and extended since he first proposed them. Childs (1995) points out that the *functions* that are characteristic of Jung's personality types are reflected in the phrases and words that we use to describe personality and behaviour – phrases such as "quick-tempered", "easy-going", "never-happy-unless-they're-miserable" and "always-on-the-go". I will describe Jung's psychological typology and some of its applications in more detail in the following section where human temperament and personality theory and the natural link between the two psychological concepts will be examined.

Jung's theory of psychological types provided the original inspiration for the widely used Myers-Briggs Type Indicator (MBTI) test devised by the mother and daughter team of Katharine C. Briggs and Isabel Myers. These researchers first introduced the prototype of the Myers-Briggs Type Indicator (MBTI) temperament test, which takes the form of a questionnaire for identifying innate personality types, in 1942. Researchers have developed several versions of this test over the years, and some of these are described in Chapter 3 where the method used in creating the research questionnaire for this study is discussed.

The Myers-Briggs Type Indicator is used for a number of different purposes. In education, for example, the MBTI may be used to assess a student's learning style. Career counsellors use this test to help their clients to determine the occupational field to which they might be best suited. It is also used in organizational settings to assess management skills and to

facilitate teamwork and problem solving. Because the MBTI can be used as a tool for self-discovery, mental health professionals may administer the test in counselling sessions in order to provide their patients with insight into those forms of behaviour and states of mind about which they originally sought counselling (Encyclopedia, 2002). This section described the origins of personality typologies in Western psychology. The following section will elaborate on the concepts of temperament and personality and the connections between the two.

2.3 The Human Temperament and Personality

Several definitions for temperament can be found in literature. The following definitions reflect the range of meanings attributed to temperament in the literature:

tem·per·a·ment (tĕm'prə-mənt, tĕm'pər-ə-) *n* (American, 2007)

1. The manner of thinking, behaving, or reacting characteristic of a specific person: *a nervous temperament.*
2. The distinguishing mental and physical characteristics of a human according to medieval physiology, resulting from dominance of one of the four humors.
3. Excessive irritability or sensitiveness: *an actor with too much temperament.*

temperament, *noun* (Roget's II, 1995)

1. A person's customary manner of emotional response: complexion, disposition, humor, nature and temper.
2. A tendency to become angry or irritable: irascibility, irascibleness, spleen, temper, and tetchiness.

temperament (Britannica, 2006)

1. In the psychological study of personality, an individual's characteristic or habitual inclination or mode of emotional response.

temperament (Oxford, 2007)

1. Emotional aspects of personality, such as joviality, moodiness, tenseness, and excitability.

temperament (eSpindle, 2006)

1. The way a particular person thinks, feels and acts.

The common essence of the above definitions is that temperament is a dimension of human personality and an expression of the way in which a particular person habitually presents and projects his/her personality to others and to the world.

Rothbart, Evans and Ahadi (2000) explain that definitions of temperament since ancient times have emphasised the balance between various personality dispositions and how these affect and express the individual human constitution. According to Diamond (1974), cited in Rothbart, Evans and Ahadi (2000), temperament comes from the Roman word *temperamentum*, which originally referred to the proportion in which the four bodily humours were combined. This historical view of temperaments as a fourfold typology can be traced to the world of classical antiquity of ancient Egypt, Greece and Rome. It remained influential among physicians and philosophers in the West for over 2000 years until it was undermined by the cumulative discoveries of modern medicine such as the circulation of the blood demonstrated by William Harvey between 1615 and 1628. But for many years, the Western view of temperament was dominated by an assertion of the connection between manifestations of human temperament and human biology (the four humours of the body).

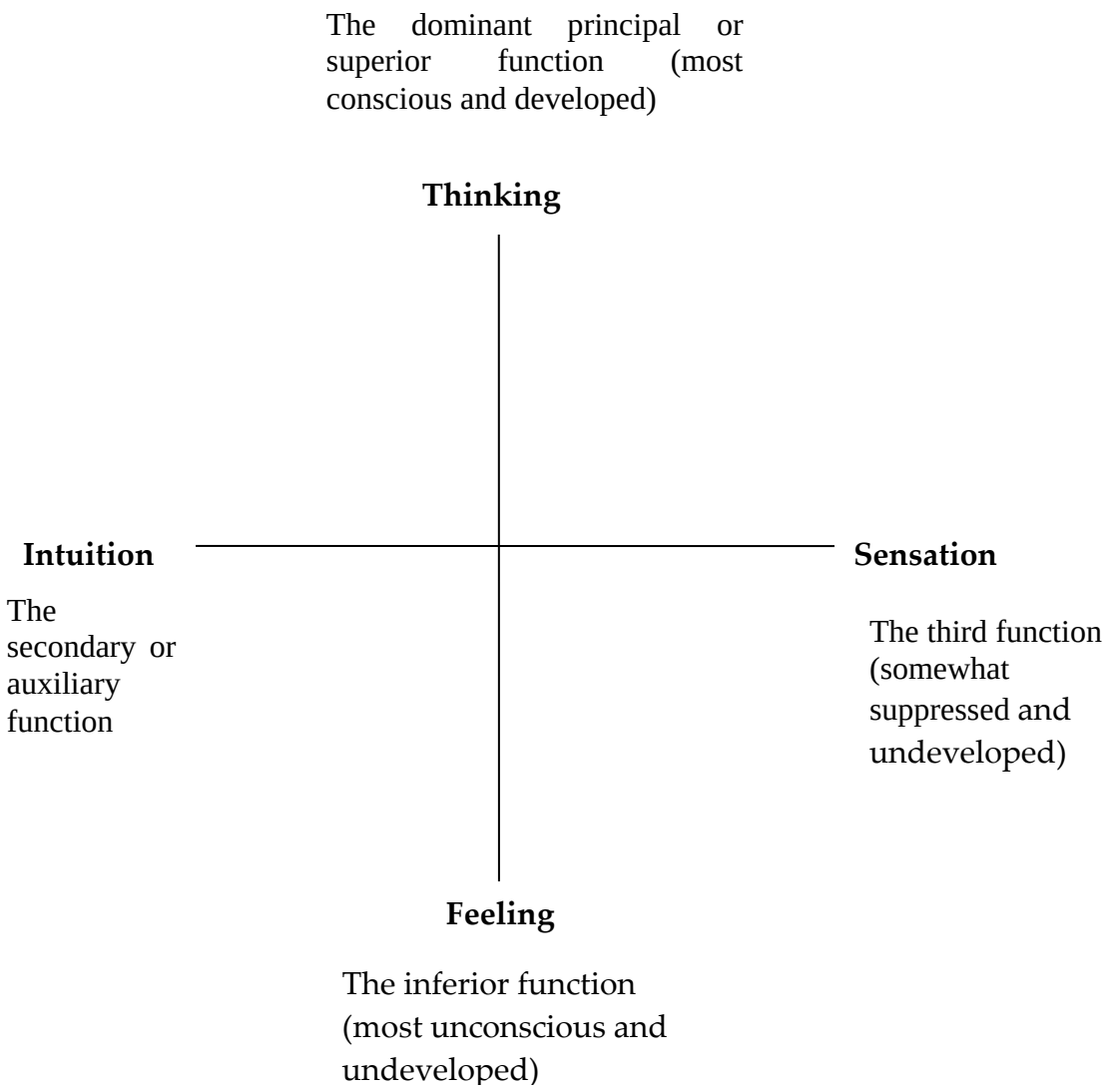
Rothbart, Evans and Ahadi (2000), and Eysenck (1967), cited in Rothbart Evans and Ahadi (2000), explain the modern typology of personality that was devised by Jung and refined by others in terms of the fourfold typology of the humours that originated in ancient times. Although the alleged physiological basis of the humours has been radically discredited in modern physiology, the temperamental divisions to which it gave rise remain valid and are (with various modifications) widely used in various contexts. In the

ancient world and until recently, a clear connection was assumed between various states of mind and emotions, and the bodily fluids to which they allegedly gave rise. The following list explains the connections between the four temperamental types, the states of mind to which they gave rise, and the bodily fluids which were thought to cause such states of minds because of their predominance in an individual.

1. The Choleric individual (who was characterised as extroverted and unemotional) was thought to be motivated by a predominance of yellow bile. The behaviour of such an individual was expected to be predominantly irritable and quick to anger.
2. The Melancholic individual (who is characterised as introverted and emotional) was thought to be motivated by a predominance of black bile. The behaviour of such an individual was expected to be predominantly sad and anxious.
3. The Sanguine individual (who is characterised as extroverted and emotional) was thought to be motivated by a predominance of blood. The behaviour of such an individual was expected to be predominantly optimistic and outgoing.
4. The Phlegmatic individual (who is characterised as introverted and unemotional) was thought to be motivated by a predominance of phlegm. The behaviour of such an individual was expected to be predominantly slow in the expression of emotion and action.

The only useful part of this theory to survive in modern medicine, psychology and the social sciences is the typology of temperaments that inspired Jung to elaborate his fourfold theory of human types. Jung (1923) supplemented the classical view of the four humours with his own addition of the factors of introversion and extraversion, and the four personality functions or methods of interpreting reality, namely **sensation**, **thinking**, **feeling** and **intuition**. In Jung's theory, thinking is the opposite of feeling, and sensation is the opposite of intuition. Because Jung regarded these four modes of interpreting reality as opposite and exclusive of one another, he depicted them figuratively in the following way as four points made by two equally dissecting lines:

Figure 2.1: The Four Functions of the Personality as Proposed by C.G. Jung



Source: Hall and Nordby (1973)

Jung postulated that if an individual were dominated by the thinking function (an analytical way of looking at reality), then the feeling function of that individual (the tendency to interpret reality in terms of emotion and heart-inspired values) would be correspondingly undeveloped and probably almost totally unconscious. He suggested that the same would be true of the intuition and sensation functions. People dominated by the sensation function are heavily orientated towards the outer reality of the appearances of the physical world, while those in whom the intuition function predominates are habitually attuned to an inner or psychic reality.

One of Jung's most valuable insights was that while one of these four functions is always predominant in any given individual (he called it the principal or superior function); it is supported by what he called the secondary faculty or auxiliary function. He carried this theory through to its logical conclusion by pointing out that the secondary or auxiliary function would tend to be somewhat undeveloped and suppressed in the personality, while the remaining fourth function (the opposite of the dominant or principal function) would be totally unconscious and undeveloped. The fourth function of personality therefore represents all that is most undeveloped, unconscious and suppressed within ourselves – those areas in which we are least able to perceive, act and function with efficiency and clarity.

Jung (1923) defined introversion and extraversion in terms of the flow of libidinal or psychic energy. In an extrovert, the libidinal energy flows outwards towards people, objects and events in the world; they obtain satisfaction and fulfilment from making connections with people, events and conditions outside of themselves, and they also tend to rely on external conditions for the fulfilment of their aims and the success of their actions. Introverts, by contrast, are typically preoccupied with their own inner thoughts and feelings and they tend to construct their reality from their own feelings, thoughts and intuitions and ideas. In social style, introverts are often characterised as reflective, thoughtful and even reserved in their general behaviour and demeanour, while the social style of an extrovert is more likely to be sociable, friendly and orientated towards outward relationships, interactions and stimuli.

Although this is a generalisation, extraversion as a trait is more likely to be found in political and social leaders while introversion is usually associated with careers in philosophy, science, research, art, religion or any kind of work that requires extended and prolonged solitary reflection and ratiocination. While extraverts are usually active and sociable people who enjoy the company of others and who seek out friends, interactions, distractions, events and meaning in the outside world, introverts are very often quite happy with their own company and generally find satisfaction and fulfilment in their own

ideas, thoughts, reflections and interests. While all human beings are capable of – and display – both extroverted and introverted forms of behaviour, one or the other of these functions is usually predominant in a particular person.

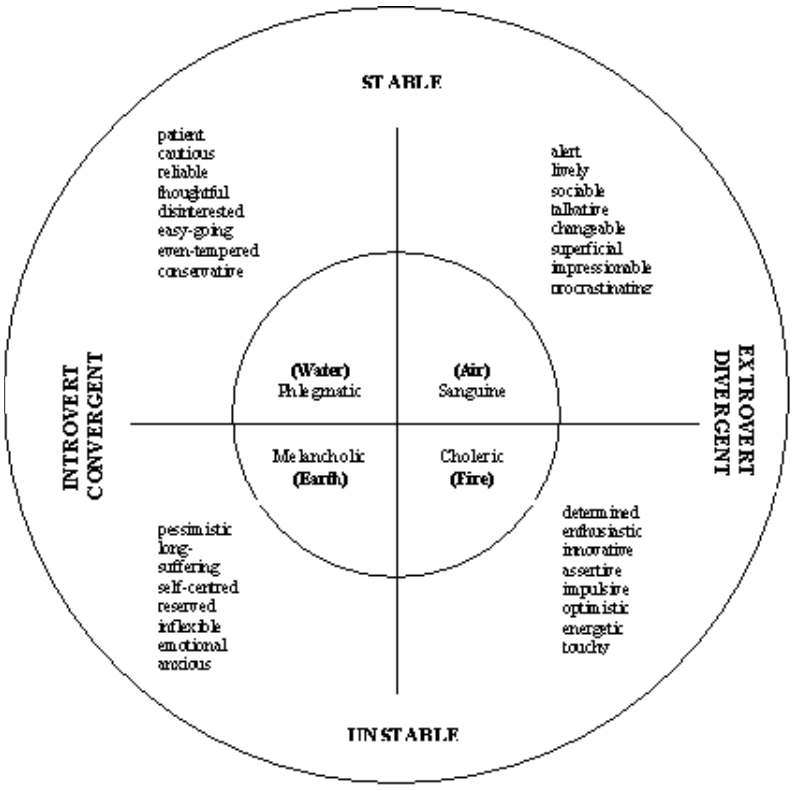
Jung's basic personality typology has been extended to include ideas of convergence and divergence in thinking. Predominantly convergent thinkers are characterised as having good powers of concentration and retentive memories and as being able to solve problems and arrive at the right answers through processes of reasoning and deduction. Because of this they are thought to be good at conventional problem solving and will often find satisfaction in careers in which they are given opportunities to arrive at solutions by means of a highly structured processes and methodologies. Such people might, for example, make excellent laboratory workers, scientists or researchers. Divergent thinkers are often characterised, by contrast, as being creative, dynamic, unconventional and intuitive, and will often rely on intuition rather than reasoning to arrive at the answers they seek. While a convergent thinker may, according to Jung's typology, be more likely to possess a Thinking-Sensation personality type, a divergent thinker is more likely to be personality that functions in terms of the Intuitive-Thinking paradigm.

A detailed representation of the qualities associated with the four temperamental types is depicted in Figure 2.2 below. This figure has been adapted from Childs (1995), and it lists the four temperaments with their associated elements and qualities. It also classifies the four temperaments in terms of introversion/extroversion and suggests how stability, instability and consistency in behavioural patterns can be attributed to the different temperaments. Child (1995) also believes that while it is possible to classify some people as habitually more stable in temperament, it is also possible to classify others as predominantly unstable in temperament. It is Child's (1995) belief that those who are more consistent in their patterns of behaviour will more frequently be identified as having sanguine and phlegmatic temperaments while those with choleric and melancholic temperaments are more likely to be less predictable and unstable as far as behaviour is concerned (Child 1995). Figure 2.2 does not attempt to portray stability or instability as

dimensions of temperament. Instead, it subsumes stability or instability as functions of temperament.

While Jung (1923) maintained that the four psychological types or temperaments that are the basis of his typology of human character could account for people's essential differences, Thomas and Chess (1977) took a more expansive view. Thomas and Chess (1977), cited in Rothbart, Evans and Ahadi (2000), define *temperament* as "the 'how' of behaviour", which they differentiate from *ability* (which they define as "the 'what' and the 'how well' of behaviour") and *motivation* (which they define as "the 'why' of behaviour"). It therefore seems possible to regard temperament as being concerned with, not only with the "what" and "why" of behaviour, but also with the "how" of behaviour.

Figure 2.2: The Four Temperaments



Source: Childs (1995: 18)

Allport's (1937) definitions of personality and trait are indicative of the centrality of temperament to his understanding of personality. Graziano, Jensen-Campbell & Sullivan-

Logan (1998), on the other hand, assume that temperament is the "biologically based, emotional core of personality" and "adult personality is presumed to emerge developmentally from temperament". Graziano, Jensen-Campbell & Sullivan-Logan (1998) have devised an interesting simile for describing temperament. They suggest that temperament is the "hard ice ball centre" around which the "softer snowball" of personality accumulates.

While temperament may be determined by genetic factors, the contours of temperament are shaped and refined by an individual's life experiences. Rothbart, Evans and Ahadi (2000) assert that an understanding of temperament is central to the understanding of personality. Psychologists have invested a great deal of research and theory over the past hundred years in the definition and description of personality because coherent definitions of personality should be useful for understanding human nature and for predicting how human beings will respond to various situations and conditions (Nass, Moon, Fogg, Reeves and Dryer, 1995: 228). The study of personality in psychology has primarily been concerned with providing a systematic and coherent account of the ways in which individuals differ from one another. According to Moon and Nass (1996), the most prominent example of the attempt to reduce the number of personality traits is the "Big Five" structure of personality dimensions. This theory proposes a five-factor model, which describes personality in terms of the following five factors:

- Extraversion (dominance or submissiveness)
- Agreeableness
- Conscientiousness (dependability)
- Emotional stability (neuroticism)
- Culture (intellect or openness to experience)

While the premise on which personality typologies is based is that the personality of human beings can be classified in terms of the individual differences and characteristics that are attributable to temperament, it is through behaviour that personality is expressed.

Character may then be regarded as the cumulative effect achieved by the repetitive expression of habitual behaviour patterns (Childs, 1995). Moon and Nass (1996) assert that one dimension in particular has been widely researched because of its usefulness in the understanding and prediction of individual behaviour, and that is *extroversion.* Moon and Nass (1996) have the following to say about the differentiation of individuals on the basis of this dimension:

> Dominant individuals tend to be self-confident, leading and assertive. They tend to try to make decisions for others, and command and direct others to take certain actions. Conversely, the behavioural cues associated with submissiveness include self-doubt and passivity. Submissive individuals also tend to be easily led, allow others to make decisions for them, and avoid responsibilities (Moon and Nass 1996: 654).

While human personality may be defined as a set of characteristics that accounts for ways in which people differ from one another (Chen and Rodgers, 2006), temperamental typologies work on the basis of grouping different personality types into four major groups, the members of which tend to react in similar ways to given circumstances. Because individuals tend to respond to situations and engage in activities in ways that are congruent with their specific temperamental typological characteristics, it is possible to predict more or less accurately how individuals will react to particular circumstances and approach specific problems (Teglasi, 1998b). From the point of view of the typology of temperaments, it is possible to generalise about how individuals will react to their environments, how they will respond to other people, what kind of activities they will habitually prefer to engage in, and how they will select and process information. All these factors represent the total set of personal experiential factors that are influenced by individual temperament.

Teglasi (1998b) undertook research to examine the role that temperament plays in shaping day-to-day experiences because it is possible to use an analysis of temperamental

characteristics to predict how people will react to specific environmental stimuli. His conclusions were that every human experience is in fact subjective because it evolves as a product of a "process of mutual regulation alternating between experiencing and explaining" Teglasi (1998b). He also found that when environmental pressures created a tension between the opportunities or demands of an individual's circumstances and that individual's customary ways of reacting to such circles (as defined by their temperament), the individual concerned began to show symptoms of distress and disorientation. He also noticed that individuals would selectively disregard information and environmental input with which they were unable to cope effectively. Cantor, cited in Teglasi (1998b), note that because emotions exert a critical impact on learning, individuals attempt to reduce any dissonance between attention and cognitive organisation by evoking whatever positive emotions are needed to process information efficiently. It is this process of consciously selecting to do what we do best in terms of our temperamental type that suggests how it is possible for people to make good choices.

Teglasi (1998b) is also the opinion that it is advantageous to embed temperamental constructs into personality theory because it facilitates a richer, more layered and more nuanced mapping of cognitively based personality theory. A common theme that links personality theory and temperament is, according to Teglasi (1998b), that information processing is driven by emotion on the one hand and by analytical thinking and socially mediated knowledge on the other. Gomez-Gauchia, Diaz-Agudo & Gonzalez-Calero (2006) refer to temperament as ways of:

- Communicating
- Thinking
- Using time
- Using tools

Although these activities may look superficially different from traditional temperament typology, a careful analysis suggests that they can in fact be reduced to the four

temperamental categories. Teglasi (1998a) asserts that temperament has a long record of demonstrating its usefulness for explaining individuality and the habitual states of mind and behaviour of individuals. He further states that there are three techniques for measuring behavioural manifestations of temperament. These are *questionnaires*, *observations* and *interviews*. Questionnaires are the most frequently used among these three for assessing and identifying temperament because they are relatively inexpensive and easy to use and because they often yield surprisingly useful, rich and detailed information about research subjects and conditions. It follows from this that a study that attempts to evaluate websites and relate them to differences in human temperament might expect to obtain useful data for analysis from utilising a methodology based on administering a questionnaire and conducting an interview.

The study of Lin and McLeod (2000) attempted to construct a new approach to the incorporation of human factors such as human temperament in particular into the adaptive information recommendation process. By doing this they devised a temperament-based filtering method that presents an effective framework for the analysis of inherent patterns of linkages between temperament identification and user interests and preferences. This framework can be used to determine the accuracy of human information systems and the ways in which experimental subjects satisfy themselves by achieving their goals.

Lin and McLeod (2000) made the assumption that a new unit of information that possesses content features that are similar to those that are already well liked by a particular group of people will in all likelihood also be appreciated by that group of people. This suggested to me that if it is possible to relate the particular features of a specific website to an identifiable set of temperamental characteristics and then to identify the group to which that website most appeals, it would be possible to replicate such temperamental characteristics in other websites and so increase the "stickiness" (desirability) of a website for a specific target market or group of people.

There have been other studies in which personality tests have been metaphorically applied to non-human entities. One such was conducted to identify the personality of motorcars, and can be found at http://www.roadandtravel.com. Because of our human tendency to describe non-human things in metaphorically human terms, we frequently use phrases such as brand personality, website personality, the personality of a motorcar and so forth. It follows from this that we should be able to use a test similar to the Myers-Briggs temperament test (which was originally based on the temperament theory of Jung) in order to identify and measure the temperament of an entities such as a website. The establishment of a website's temperament will not give rise to value judgments such as "This is a good website" or "This is a bad website" because just as human temperaments are neither good nor bad, so websites are either compatible with and attractive to a particular target audience – or not. What is good or bad in such a context will be what corresponds most closely to the characteristic values and interests of a particular target audience. The purpose of this study therefore is to offer some degree of empirical proof of how users with certain predefined temperaments might interact and respond to a website that contains features that should be attractive to people of such temperaments.

Childs (1995) states that true self-control and efficacy resides in the ability to exploit temperament consciously and deliberately and to manipulate temperamental characteristics and properties for optimal effect and efficiency. This study is based on the assumption that if such a procedure is true for human beings, is there any good reason why it may not be true for machines and user interfaces for human-computer interaction? Since the human brain seems to possess an innate tendency to personalise or anthropomorphize our perceptions, would it not be possible to exploit this tendency for the purpose of constructing human-computer interfaces with features that we know will appeal to users of various temperamental types?

In this section, I described the terms of the typology of human temperaments that were first devised by C.G. Jung, and I also explained how it was thought developed and extended by other researchers. I then made the observation that human beings habitually

personalise their perceptions by attributing human temperamental characteristics to inanimate objects such as motorcars and computer interfaces. I will now look more closely at our human tendency to anthropomorphize non-human objects in the world around us, and will explain the consequences of this human habit for this research.

2.4 Anthropomorphism

The concept of anthropomorphism was defined by Agassi (1973: 87) as "an inveterate tendency to project human qualities onto natural phenomena – consciously or not". This supports the contention made in the previous section, namely, that human beings habitually attribute exclusively human characteristics and qualities to non-human or inanimate objects. This universal tendency of human beings is one of the most constant features of human perception in all cultures. It is so widespread a phenomenon that its occurrence is mostly unconscious. To illustrate this one has only to recall how often people give their cars a name or how they refer to their cars using affectionate nicknames. People in difficult circumstances frequently also habitually appeal to or address their computers, printers, motor vehicles, vacuum cleaners and other machines and devices in terms that express affection, bargaining, threat or exasperation. Fournier (1998) believes that humans have a need to anthropomorphise objects in order to facilitate and make sense of their interactions with objects in the non-material world such as, for example, computer programs or the Internet.

This natural but unconscious tendency is, of course, widely exploited by the creators of computer games, and it is also applied in the fields of robotics and artificial intelligence, where it is has caught the attention of software and website designers (Weibel, 1990). Hackers also use the language of human actions and emotions to describe the behaviour of computer systems. Weibel (1990) reasons that since we build machines such as computers and create computer programs that have to be compatible with them, it is natural for us to devise interfaces that will meet our expectations as human beings and be responsive to our needs and expectations. Because we belong to the species *Homo sapiens*, it is natural for us to interpret everything in terms that a human being would understand.

Thus, for example, when people ask, "Is there life on other planets?" they nearly always mean, "Is there *human* life on other planets?"

Because the human brain is hardwired to understand phenomena in human terms, we unconsciously anthropomorphize inanimate objects so that they become more accessible to our understanding. It is for the same reason that people anthropomorphize all kinds of things from motor vehicles to animals. The success of Walt Disney and the corporation that he founded is based on the simple premise that human beings are amused and entertained by anthropomorphized animals who reflect our own dilemmas, fears, hopes and needs – a process that began with Mickey and Minnie Mouse in the 1930s and that continues to generate billion-dollar revenues today. This tendency of human beings to anthropomorphize animals and inanimate objects should be appreciated in parallel to the widespread human tendency to utilise *animal* imagery in our understanding of the world and our interpretation of reality. All languages are rich with animal metaphors that express every kind of action and emotion, and people often confer nicknames on one another because human beings often resemble animals in some quite striking ways. This kind of imaginative cross-fertilisation of personifications is something that is innately human and that clarifies and enriches the meaning of our consensual reality.

The tendency of human beings to respond more readily to humanoid features in a machine such as a computer has been deeply significant in the fields of artificial intelligence and robotics. The fact that the human brain has evolved in such a way that it responds more readily and easily to personifications of human qualities than it does to machinery that is devoid of humanoid resemblances has been widely exploited by researchers and developers in these fields. Designers have been actively creating technology that accommodates and facilitates interactions between users and machines this since the 1960s. According to Cleland (2007), the "Eliza effect" is a term used to describe the human tendency to anthropomorphise technology and to read human-like meanings, motivations and even emotions into otherwise meaningless or value-free technological outputs and behaviours. Complex and sophisticated programs and

technologies such as those that have been utilised in the ALICE (Artificial Linguistic Internet Computer Entity) already exist to accommodate the extensive need to anthropomorphize programs and websites alike.

The universal and instinctive epistemological reductionism that impels human beings unconsciously to anthropomorphize inanimate objects so that they can understand and relate to them better underlies the assumption on which this study is based. This assumption is that *human beings react instinctively to websites in terms of the unconscious personification of the elements that they perceive in those websites*. Because such a human tendency is universal, my hypothesis is that people will react strongly to websites that coherently embody and personify human characteristics. And since, as Jung and others have demonstrated, it is empirically feasible to classify human personality in terms of a typology that contains four major temperamental types (with many possible variations), the most effective websites will be those that unconsciously project a personified image of a coherent human personality that corresponds to the needs, aspirations and desires of those who interact with them.

Tan Tsu Wee (2004: 317) states that because human beings maintain their sense of identity in the process of interacting with whatever they encounter, they tend to enhance personal identity through attributing symbolic meanings to inanimate objects. He notes that this process of identity formation through the attribution of meaning is not necessarily unintentional because, as we noted above, human beings very often attribute meaning *intentionally* to objects. On the basis of Tsu Wee's (2004) observations and the reflections contained in the discussion above, I venture the further observation that it could be useful for designers to apply human temperament theory to inanimate objects for the purpose of increasing the effectiveness and utility of the machines with which human beings are required to interact.

In terms of the assumptions made in this study, I am especially interested in the application of the categories of human temperament to the field of website design because

I believe that since it is possible for human beings to have strong emotional reactions to websites, it is important to construct and design a website so that it unconsciously reflects the kind of human being to which potential users would have a favourable reaction. If this can be achieved, it would be possible to predict whether or not a particular sample of individuals with special needs would react favourably to a specific website that had been designed for their use. If it is indeed possible to design a website so that the match between its users and the interface which they encounter can be optimised, it would be possible to predict the degree of desirability or "stickiness" of a particular website design for its intended users.

The obverse of the assertions made in the previous paragraph is also true. If a particular website projects a temperament that alienates typical users, then the resultant antagonism, even though it might be unconscious, would undermine the viability and usefulness of the website concerned. It is clear that extensive research is required to identify the kind of temperaments that will appeal to particular groups of users. Researchers are also needed to determine exactly how a particular temperament will translate into specific design features on a website. Once designers have this information, it should be relatively easy to design websites that will appeal to identified users and that will attract an optimal number of return visits from each individual user. When users feel comfortable on the website because it answers to their needs and expectations, they develop the kind of loyalty towards that website that optimises the business for which it was created. If the nature of the business promoted on a website changes, then it becomes necessary to ascertain whether the current website still reflects the "temperament" of the owners of the website.

Caution, however, is needed before changes are made to a successful website because changes in the temperament of a website might be as unwelcome to users as unexpected changes in the nature, temperament or attitudes of a trusted and well-loved friend. Once a website has been put into use and has been proved to be successful, changes should only be effected with the greatest care and foresight. Random cosmetic changes should be

avoided at all costs because they tend to irritate and alienate frequent users. This suggests that it is vitally important for designers to get a website right before it is put into use because changes to a website after it has been launched are bound to create negative perceptions about a company or organisation in the minds of its users. Research is therefore needed to match human temperament to website design. Such information should be standardised and available to all website designers.

Crawford (2003) devotes an entire chapter to the subject of anthropomorphisation. He states that software designers need to accept that the application of anthropomorphisation is inevitable in technology, and that software designers are the enablers of anthropomorphisation. Even though the anthropomorphisising of computers has long been a stock-in-trade and source of amusement in the entertainment industry (one has only to think of how Captain Kirk confuses the computer in *Star Trek* episodes), the complexity of modern software and user interfaces and the high expectations that users have, has made anthropomorphisation an essential part of the computer industry. Even though the accumulated knowledge and expertise for anthropomorphising computers and user interfaces is certainly far from adequate at this stage, Crawford (Crawford 2003) envisages a world of the not-too-distant future in which it will be omnipresent. This section described the importance of anthropomorphisation in the social world of human interactions and communication and how it is technological enablers and web designers who have the responsibility of meeting this particular need in the modern world. The following section will investigate and describe further aspects and some of the implications of the interactions that take place between human beings and computers.

2.5 *Interactions between Human Beings and Computers*

"Today, we don't want our machines to obey us, we want them to respond, which is a part of this inversion of man/machine" (de Kerckhove, 1991). More and more engineers such as computer interface designers are developing technologies that are capable of behaving with quasi-human sociability or that are able to take on roles that were previously performed by human beings alone (Shechtman and Horowitz, 2003). The

shopping website, for example, is able to replace the sales assistant and the cashier. Most of the transactions and services offered by banks can now be performed online on safe and secure websites.

Allport (1985) defines social psychology as "the discipline that attempts to understand and explain how the thoughts, feelings and behaviours of individuals are influenced by the actual, imagined or implied presence of others". Social psychological research literature contains many reports of how the "presence" of others results in a variety of affective social responses (feelings, for example), cognitive social responses (attitudes, for example) and behavioural social responses (such as obedience). Social verification reflects the extent to which people experience interpersonal encounters in ways that verify that they are engaged in meaningful interpersonal communication (Swinth & Blascovich, 2007).

The interpersonal factors that confirm that individuals are experiencing a sense of social verification are:

- Motivational factors (such as interact ional goals)
- Affective factors (such as mood or feelings)
- Dispositional factors (such as temperament)
- Psychological factors (such as opinions)
- Organismic factors (such as age and gender)
- Demographic characteristics (such as race or religion)

McIsaac and Gunawardena (1996) define social presence as "the degree to which a person feels socially present or the degree to which a person is perceived as a real person in a mediated communication situation". Heeter (1992) defines social presence as "the extent to which other beings, both living and synthetic, exist in a virtual world and appear to react to you". In virtual situations such as email correspondence and chat rooms, users resort to combinations of letters (such as "LOL" and "ROFL") and manufactured

typographical symbols such as emoticons (such as ;-) and :-( ) as a substitute for the non-verbal social cues that convey so much information and contribute so much meaning to discourse in human-to-human mediated communications.

Swinth and Blascovich (2007) define social presence as the actual, imagined or implied presence of others. Sproull and Keisler (1986), cited in Swinth and Blascovich (2007), argue that the critical difference between face-to-face (person-to-person) communication and mediated communications (such as those that take place by means of email or even between human beings and computers) is that many forms of media lack social context cues. Such cues include various aspects of the physical environment as well as the non-verbal behaviours that contribute so much to the nature of the social interaction and the relative status of the participants taking part in the interaction.

This leads me to make the assumption that if a computer or a website is to stand in the place of other human beings and assume various human roles in discourse or interaction, it needs to be able to establish a *social context* with the human being with whom it is interacting. It is only by doing this that a computer or website is able to simulate the reactions and communications of a flesh-and-blood human being with a believable degree of efficiency and verisimilitude. Swinth and Blascovich (2007) note that researchers have suggested that individuals unconsciously attribute human characteristics such as gender, ethnicity or personality to computers. They also point out that human beings apply the same social rules, conventions and expectations that they customarily apply to face-to-face interactions with other human beings when they interact with computers.

Shechtman and Horowitz (2003) ask the question: "How is interacting with computer programs different from interacting with people?" One answer that is found in the literature suggests that these two types of interactions are actually quite similar in many ways. Nass and Moon (2000) clarify this by suggesting that the underlying mechanism in human-computer interaction is that people respond "mindlessly" (i.e. automatically or without conscious thought) to social stimuli – whether they come from other people or

from a non-human entity that "behaves" like a human being. When one takes into account the frequency with which people use computers to conduct personal business and other transactions online in the modern world, the sheer volume of daily interactions between human beings and computers becomes apparent. It is the ever-increasing number of these interactions throughout the world that lead one to the inescapable conclusion that interactions between human beings and computers account for a very high percentage of all the interactions of people who use computers extensively for business, socialising and for pleasure.

Shechtman and Horowitz (2003) point out that many of the characteristics of human-computer interactions are similar in many ways to the relationships that human beings have with one another. Such computer-human relationships are all the more powerful because of the unconscious way in which they mimic relationships between human beings. Since these relationships exert a profound effect on those who use computers, it is essential for designers of websites and interfaces to have as clear an understanding as possible of the ways in which users are affected by the elements of websites and the interfaces with which they come into contact. Research is needed to establish the exact modus operandi of interactions between computer users and the features of the interfaces that they encounter online. It is theoretically possible to foresee a time when research will have given us such a clear understanding of the mechanisms that govern interactions between human users and interfaces that we will be in a position to predict how the elements and features of an interface will affect the behavioural patterns of those who use them. It is the intention of this research to make a modest contribution to the sum of existing knowledge about how certain elements of design in the interfaces are likely to affect the behaviour of those who encounter them online. Nass, Steuer and Tauber (1994) conducted five studies, which produced evidence that the interactions between the participants who took part in the research and the interfaces to which they were exposed were fundamentally social. The purpose of the five studies was to attempt to answer the following five questions:

1. Will users apply politeness norms to computers?
2. Will users apply the notions of "self" and "other" to computers?
3. On what basis do users distinguish computer as "self" or "other" – the voice or the box?
4. Will users apply gender stereotypes to computers?
5. If people do respond socially to computers, is it because they feel that they are interacting with the computer or with some other agent such as the programmer?

(Nass, Steuer and Tauber, 1994)

The research conducted by Nass, Steuer and Tauber (1994) enabled them to clarify a number of assertions about the implications for the theory and design of human-computer interaction. These implications are summarised in Table 2.1 below. An extrapolation from their research findings makes it clear that when computer users are confronted with even a limited set of characteristics that we usually associate only with human beings, such users tend to exhibit behaviours and attribute qualities to computers that are nonsensical when applied to computers but that are indeed appropriate when predicated of other human beings (Nass, Steuer and Tauber, 1994: 72).

This research encourages us to assume that computer users can be influenced to display certain social behaviours in response to what they see on computers in spite of the fact that they are consciously aware of the fact that these machines do not really possess human emotions or human attributes such as gender and other human characteristics. This research has demonstrated that the social rules of conduct that guide human-human interactions apply with equal force to human-computer interaction because of the fact that human-computer interactions are fundamentally similar to those that occur between one human being and another.

Table 2.1: Theoretical and design implications for human computer interaction

Theoretical Implications	Design Implications
Social norms are applied to computers.	Usability testing should not be same-

Theoretical Implications	Design Implications
	machine based.
Notions of "self" and "other" are applied to computers.	Modesty is a complex phenomenon.
Voices are social actors.	Integration is highly consequential.
Notions of "self" and "other" are applied to voices.	Uniformity of interface is double-edged.
Computers are gendered social actors.	Social cues need not be heavy-handed.
Gender is an extremely powerful cue.	Choice of voice is highly consequential.
Computer users respond socially to the computer itself.	Agent integration/differentiation is easily created.
Computer users do not see the computer as a medium for social interaction with the programmer.	Agent integration/differentiation is powerful.
Primitive cues are powerful.	Social actors can be easily portrayed on multiple computers.
Social responses are automatic and unconscious.	Cross-computer continuity of social actors is easily obtained.
Findings in social psychology are relevant to human responses to computers.	Gender of voice is highly consequential.
Human-computer interaction is social-psychological.	Computers need not refer to themselves as "I" to generate social responses.
Experimental paradigms are interchangeable.	

Source: Nass, Steuer and Tauber (1994: 77)

In a subsequent study carried out a year later, Nass, Moon, Fogg, Reeves and Dryer (1995) demonstrated that by using a minimal set of cues one could easily create "computer personalities" and that people would respond to these "computer personalities" in the same way in which they would respond to similar human personalities. They were also able to make the additional observation that computer users preferred to interact with computers that had personalities that were similar to their own. Nass, Moon, Fogg, Reeves and Dryer (1995) found that when computers were matched with participants in terms of similarity of personality, the participants obtained a far greater degree of satisfaction from their interactions with their computers than when they were asked to interact with computers that had personalities that were "hostile" or "alien" – or simply different from their own. They concluded from this that certain indicators of personality can function as powerful behavioural stimuli, that they are relatively easy to reproduce

and manipulate, and that, even in their simplest forms, they have the potential to provoke quite complex social behaviour in computer users.

This research led me to hypothesise that it should be possible to design websites in such a way that users will react and respond to them unconsciously as though they were human beings with specific human temperaments. If this is true, website designers should be able to imbue websites with such judicious combinations of human temperamental characteristics that will evoke in users the kind of behaviour that will be to the advantage of the owner of a website.

Cockton (2002: 89) starts off his editorial with the following well-versed words:

> "Cogito, ergo sum" – "I think, therefore I am" – declared the seventeenth century philosopher René Descartes. Descartes' experience of his thinking confirmed his existence, but almost four centuries on we are today more inclined to the position that "I feel, therefore I am". In the first Star Trek series, Dr Spock thought feelings were only a detriment to thinking and as such found it hard to understand human behaviour. Why then has the study of human-computer interaction hardly evolved beyond a Dr Spock view of the universe, when feeling is so obviously central to our humanity? If Descartes had been an early pioneer in human-computer interaction, he may well have changed his dictum to "I think, therefore this user interface is too hard.

Cockton (2002) then asked the question: "What would it take to make interaction with computers part of people's lives, rather than transmitting an experience of alienating amputation?" My own answer to this question would be that the design of computer artefacts (technological enablers) should strive as much to empower and enable the experience of the user as it does to achieve the desired outcome. Cockton (2002) is of the opinion that the experience that users have when they interact with websites should be not only satisfying, but also enjoyable, exciting, compelling and self-realising. Cockton's

(2002) basic premise is that users should find their interaction with websites as agreeable as they would find similar interactions with human beings who are thoroughly compatible with themselves. While this may sound like a tall order for the average kind of website to which the general public is exposed, we do in fact expect such satisfactions from our interactions with the human equivalents of a website.

Let us consider for a moment the example of a banking website that exists purely for the convenience of the client and the bank itself. Although banks exist purely to provide certain services and to make a profit from doing so, experience has taught us that our experience of interacting with our bank is likely to be both efficient and pleasurable. This is because modern banks appreciate that they will be more likely to attract and keep customers if they project a certain kind of "personality" in their dealings with the public. They therefore strive to ensure that both their personnel and their services unambiguously project the kind of personality, which they know is likely to facilitate their business and please their customers. And because so much of the business of modern banks is conducted by means of websites, it becomes vitally important that the bank's website will also project the kind of personality selected by the bank to represent their human face.

Since organisations do in fact accept that it is necessary to project a certain face or personality towards the world and the public at large, they are willing to spend large amounts of money to discover what this kind of corporate personality would be for their particular kind of work and activity. The better the "fit" between the face that represents the activities and mission statement of the organisation, and the public that they wish to attract, the better will the organisation's purposes be served by the human personality, image or temperament that has been selected to represent them. Although the organisation's website is but one aspect of its corporate personality, it needs to project the human temperament of the organisation as fully and completely as possible because it exists in cyberspace where no human operatives are present to give it a human face.

Since even the most taciturn of our species are programmed to react emotionally to what confronts us, it follows that technological interfaces and websites that fail to project even subliminal hints of an appropriate human face or temperament, will leave us feeling literally "cold" (i.e. without any kind of emotional response). Even the baseline response of customer *satisfaction* (such as we would hope to experience on a good banking website) can be reduced to a complex aggregate of user emotions of the kind that we would experience when interacting with an exemplar of all the best qualities of that bank as an institution. While there are some websites that are designed to elicit extreme emotional responses, there are others that are designed merely to give satisfaction by creating the kind of atmosphere in which the user's business can be expedited. And yet the success of both such websites is dependent on the extent to which the designer has been successful in projecting the business of the website through incorporating certain design elements that he or she knows in advance will embody the human personality of the organisation's business.

Cockton (2002) asserts that when designers set out to provoke a particular kind of human-computer interaction, they must address both the "being" as well as the "doing" of the idealised personality of the website concerned. Cockton (2002) therefore concludes that it is essential for website and interface designers to move beyond the requirements of cognition (i.e. mere information) and to embrace whatever emotions and other aspects of our common humanity will promote the effectiveness and "stickiness" of the website. The problem is, of course, to identify as exactly as possible the match between human temperaments and interface design features, and it is to the solution of that problem that this study hopes to make a modest contribution.

Moon and Nass (1996) loosely define personality as "that set of characteristics describing how individuals differ from one another". Moon and Nass (1996) continue by asking how it is possible to project or embody personality by means of a montage of characteristics that suggest human personality. In doing so they question whether a non-human personality could ever truly be "real". But the designers of interfaces are not

fundamentally concerned with the reality or otherwise of the human personality that they project on a website. They depend instead on creating an effect of verisimilitude on what is commonly called "psychological reality". When the human organism encounters all the attributes of a particular human temperament or personality in one location such as a website, it responds to the agglomeration of all those attributes *as though it were responding to a real human being*, and that is the reality on which the ability to create artificial projections of human personality depends. One could summarise this by saying that human beings tend to respond to human-like projections of personality in exactly the same way that they respond to such projections when they encounter them in real human beings (Moon and Nass, 1996).

This means in effect that if a user responds to a projected computer personality in the same way that he or she responds to the personality of a similar but actual (real) human being, one may conclude that such a computer personality is – for all intents and purposes – psychologically real to that individual. The research undertaken by Moon and Nass (1996) led them to the conclusion that if one wishes to create a computer personality, it is not even necessary to utilise the latest technological means for reproducing human features online. They found that even a minimal set of cues was sufficient to project a computer-based personality that met all the necessary psychological criteria. This is in line with what is currently known about the ability of the human brain to create a complete picture of an entity from even the most minimalist fragments.

Moon and Nass (1996) conducted two studies in which they tested whether people would respond to computer personalities in the same way they responded to human personalities. These studies produced strong evidence to suggest that computer personalities are psychologically real to users. This means in effect that human beings tend to respond to computer personalities of this type *as though they were real human beings*. These studies raise the question of why people respond socially to non-human entities such as computers, robots or websites as though they were human beings when they would be consciously aware (if questioned) that the entities to which they are responding

are not human at all. The explanation offered by Moon and Nass (1996) is that human beings (like all other living creatures) are so conditioned by their distinctive physiology to respond to a specific set of visual and other cues that when they are confronted with these cues, they respond quite automatically. In the same way that ducks, for example, are deceived by the artificial duck calls of duck hunters, predictable social, emotional and intellectual responses within human beings are automatically triggered by an aggregation of cues that the human brain identifies as human. This kind of automatic stimulus-response behaviour supports the view that it is possible to construct an interface or website with such a carefully selected composite of humanoid features that any user will automatically respond to the interface of a website *as though it were another human being*.

Moon and Nass (1996) used their research to compile the following list of typical behaviours that people will display towards their computers:

- People will apply standards of politeness to computers, despite their denials to the contrary.
- People will react to gender stereotypes emanating from voice-based computers, despite vigorous denials to the contrary.
- People will react to perceptions of praise and criticism emanating from computers.
- People will try to ingratiate themselves with the "human being" that they perceive in a computer, and they will also make attempts to affiliate themselves to the perceived personality projected by the computer.

Hudlicka (2003) argues that the synergy of technological and methodological progress on one hand and changing user expectations on the other hand have created an urgent need for the redefinition of the requirements for effective and desirable human-computer interactions. It is being more and more widely accepted that it is the needs, attitudes and responses of the typical user that should be the main focus in interface design. In other words, it is the requirements of the user that should inform the appearance, usability, purpose and function of an interface as well as the allocation of functional tasks to either

the user or the machine. What adds to the complexity of this task is the number and diversity of the typical user's tasks and purposes, the increasing heterogeneity of the user population and the decreasing tolerance of typical users for any frustration of their purposes and intentions. Hudlicka (2003) is of the opinion that one of the most important aspects of effective human-computer interaction in general is the ability of new technologies and methodologies to accommodate user affect and to turn it to the advantage of the technological device or program.

"Affective computing" can be defined as "computing that relates to, arises from and deliberately influences emotion" (Picard, 1997). I have argued above that machines can behave in ways that appear to project human emotions or (more narrowly) a particular affective state or condition. An "affective state" could be either a simple reaction and a basic emotion, or more complex emotions, moods or states. Hudlicka (2003) states that affective states can manifest in distinctive and often highly individual ways in the following four categories or modalities of emotion affect:

- the somatic-physiological
- the cognitive-interpretive
- the motivational-behavioural
- the experiential-subjective

(Hudlicka, 2003)

Such manifestations arise out of (1) the uniqueness of the individual (his or her temperament, individual history, current physiological state and psychological context) and (2) the situational context. It is the utmost importance for system designers to be aware of the range of possible affective states that a user could experience during interactions and to build these by means of technological enablers into interfaces that interact with users.

In reference to Fellous' (1996) overview of theories of emotion, Hudlicka (2003) notes that emotions have been "a topic of wonder, research and polemics since antiquity –

fascinating, frightening and generally puzzling the common man, the researcher and the philosopher alike" (Hudlicka, 2003). The importance of emotions for this study is that they have the ability to affect us profoundly. Under certain circumstances emotions have the power to control us and even to overwhelm us, and, because of that, they are able to exert a decisive effect on what we do and how we do it. Because emotions are so central to the human organism, a great deal of research has been carried out into affective development and the subjective components of emotion: the feeling states, the influence of cultural differences, and the diversity of personality (Hudlicka, 2003).

In interpersonal situations, manifestations of behaviour and emotional states serve to communicate intentions and behavioural tendencies. By doing this, they influence the course of social interactions and ensure appropriate responses. The stimuli that drive human interactions can also be applied to the interface between human computer users and the computers or technologies with which they interact. In this way it is possible to exert a decisive influence on human behaviour by introducing features of human personality into the interface between user and computer. By doing this, the designer can elicit the kind of general affective state that can be analysed in terms of the stages of affective processing. These five stages of affective processing comprise:

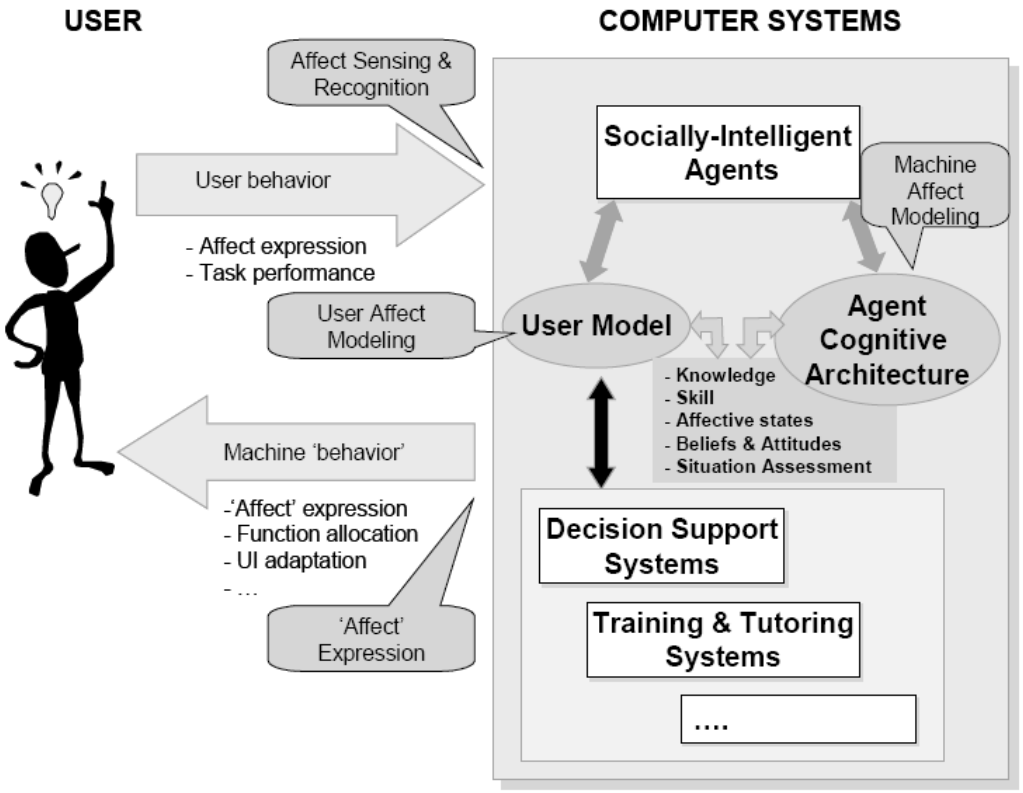
- Sense
- Recognise
- Interpret and appraise
- Select or generate
- Express

(Hudlicka, 2003)

The sequence of these stages is similar to the see-think-do processing structure that characterises some cognitive architectures (Hudlicka, 2003). Hudlicka (2003) suggests that the complex landscape of technologies and methodologies that occur in research into affective computing be organised into a framework in accordance with the stages depicted in Figure 2.3 (below). The point of constructing such a framework is to identify a reliable

method for developing systems and interfaces that are capable of interacting with human users in an adaptive and seamless manner because they respond to user affect.

Figure 2.3: Framework for organising affective human-computer interaction



Source: Hudlicka (2003: 3)

Interactivity can be defined as "a cyclic process in which two actors alternatively listen, think and speak" (Crawford 2003). One may deduce from this that the ultimate quality of the interaction will depend on the quality and sufficiency of each step in the process of listening, thinking and speaking. Crawford (2003) asks the fundamentally important question, "Why bother with interactivity?" In his answer to this question he states that interactive communication is superior to conventional one-way interaction and that the ability to be interactive is one of the computer's most intrinsic competitive advantages. He points out that interactivity catches the attention of the user and that it causes the user to want more and to come back for more. Human beings are apparently hardwired to respond to stimuli that come from other human beings or from machines that act in

humanlike ways. The main purpose of the designer who implements interaction should be to optimise the user's interactions by making the quality of the user's experiences as meaningful, interesting, rewarding and attractive as possible (Preece, Rogers and Sharp, 2002).

The construction of the most advanced kinds of interactive systems has required the expertise and professional input of psychologists, programmers, educational technologists, developmental psychologists and training experts. This cumulative expertise has been sharpened since the 1980s by the addition of sociologists, anthropologists and experts in speech, drama and voice production. The importance of this subject and its application to websites has been given more and more priority in recent years as marketing managers have appreciated the extent to which the success of their operations is directly affected by branding, the number of website hits and their customer return rate. If all these factors are taken together, they can be reduced to the way in which customer satisfaction is affected by the usability of an organisation's particular website (Preece, Rogers and Sharp, 2002).

Klein, Moon and Picard (2002) conducted a study into some of the negative side effects of using technology. They suggest that negativity generated by human-computer interaction systems can be overcome if an interface actively supports a user's ability to manage and recover from negative emotional states. One of the most important findings in their study was that the active use of technology often produces disagreeable and unpleasant side effects such as strong negative emotional states in users. These emotional states include frustration, confusion, anger and anxiety – states that can adversely affect not only the interactional event but also a user's productivity, learning, social relationships and overall sense of well-being.

There is probably not a single regular user of computer software and the Internet who has not experienced just such negative emotional states. Everyone who has enjoyed a long association with computers and technology will be able to recount examples of

interactions that gave rise to exactly such negative feelings. It is the view of Klein, Moon and Picard (2002) that negative experiences of computers and technology subvert the trust, cooperation and good faith that exist on the side of the user because human beings are complex and labile affective entities who are driven by a whole range of emotions, needs, hopes, fears and environmental factors.

Psychological research into the implications of interaction between human beings and machines has been carried out for decades. Newell and Card (1985) saw the potential of the role of psychology in the progress of human-computer interaction as early as 1985, and recorded their view that the field of human-computer interaction required input from a number of disciplines that included computer graphics, human factors, cognitive psychology and artificial intelligence. Newell and Card (1985) realised that the huge amount of multidisciplinary research in this field was motivated by the shared desire to improve the quality of interaction between human beings and computers because (as we now realise even more clearly) computers are taking over the role of people in more and more aspects of our day-to-day life. There are more and more situations in the modern world in which computers actually "control" our lives without us necessarily being aware that they are doing so. One has only to think of the complex technology that contributes to the safe takeoff and landing of a large aircraft such as the new Airbus 380 "Superjumbo" jet that is designed to carry 555 passengers. Or the way in which the vital functions of sophisticated car engines are controlled by mini-computers. Or the way in which kitchen appliances are becoming more and more "intelligent" and how a pre-programmed "smartphone" can do all kinds of things without any input from its owner.

The almost science-fictional bizarreness and mind-boggling capacity of the advances in the field of human-computer into action is best summed up by the words of Morpheus when he says to Neo in *The Matrix* (IMSDB, 2008):

> You take the blue pill and the story ends. You wake up in bed and you believe whatever you want to believe. You take the red pill and you stay in Wonderland and I show you how deep the rabbit hole goes.

The science of human-computer interaction has made a great deal of progress in the last few decades. It is up to each and every organisation to decide how seriously they intend to take the findings of all this research. It is also up to them to decide how they will exploit the knowledge that has been accumulated in this field in order to enhance the "stickiness" and profitability of their websites and their online communication interfaces. Those who ignore these findings do so at their peril because human progress, especially in the field of computer-related studies, never stands still. Those who are reluctant to take advantage of these findings will find that they have been left behind in the race towards a more effective world in which human-computer interactions have become part of the daily pattern and tenor of life.

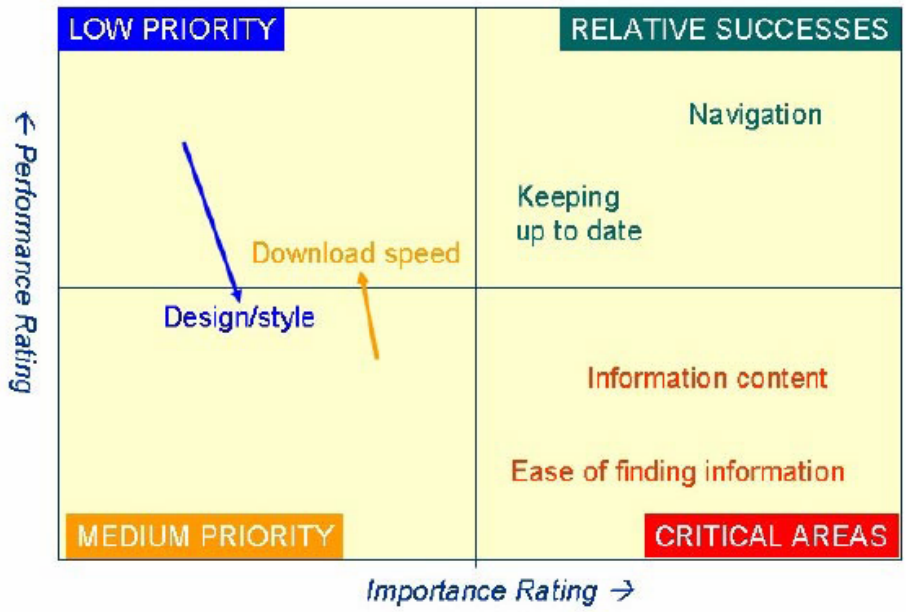
I have already described how human-computer interaction is based on the certainty that human beings will always react to anything that appears to be human even though they might understand rationally that it is not. This responsiveness of the human organism to humanoid stimuli represents the foundation on which the science and practice of human-computer interaction studies have been built. In this section I also quoted research from the field of human-computer interaction to support the contention that human beings habitually respond to humanoid stimuli *as though they were responding to real, living human beings*. I also described the role that our human emotions play in our responses to the interfaces of technologies and the websites that are an ubiquitous part of the human scene at the beginning of the 21st century. In the following section I will explore, describe and comment on the current state of knowledge about user interface design.

2.6 User Interface Design

Between the early 1990s and the present day, website design has progressed from being able to solve problems such as excessively long download times toward a consideration of

the relevance of issues such as image and personality. Figure 2.4 below illustrates Comley and Lang's (2007) view of how the priority and performance factors of website design have changed over the last decade. The figure shows that while factors such as design and style have become more important, download speed has become less important and information content has become critically important. Comley and Lang (2007) state that although they have been able to observe recurrent themes and rules for good website design because of their research, the effectiveness of such themes and rules is often invalidated by the user expectation effect and the "user's mood state" during interactions.

Figure 2.4: Recent changes in the priority and performance factors of website design



Source: Comley and Lang (2007: 3)

They note, above all, that the *usability* of a website greatly influences the prevailing mood and quality of the interaction between the user and a site. According to Preece, Rogers and Sharp (2002), the usability of a website can be measured against the following usability criteria (arranged in the form of questions):

- Is the website effective from the point of view of the user?
- Is the website efficient from the point of view of the user?

- Is the website safe for the user?
- Does the website score highly in terms of utility?
- Is it easy to learn to use the website?
- Is it easy to remember how to use the website?

(Preece, Rogers and Sharp, 2002)

In addition to usability goals, interface design should be dedicated to maximising the experience of users while they interact with the interface. The ideal website will enable users to have an experience that can be described as:

- Satisfying
- Enjoyable
- Fun
- Entertaining
- Helpful
- Motivating
- Aesthetically pleasing
- Supportive of creativity
- Rewarding
- Emotionally fulfilling

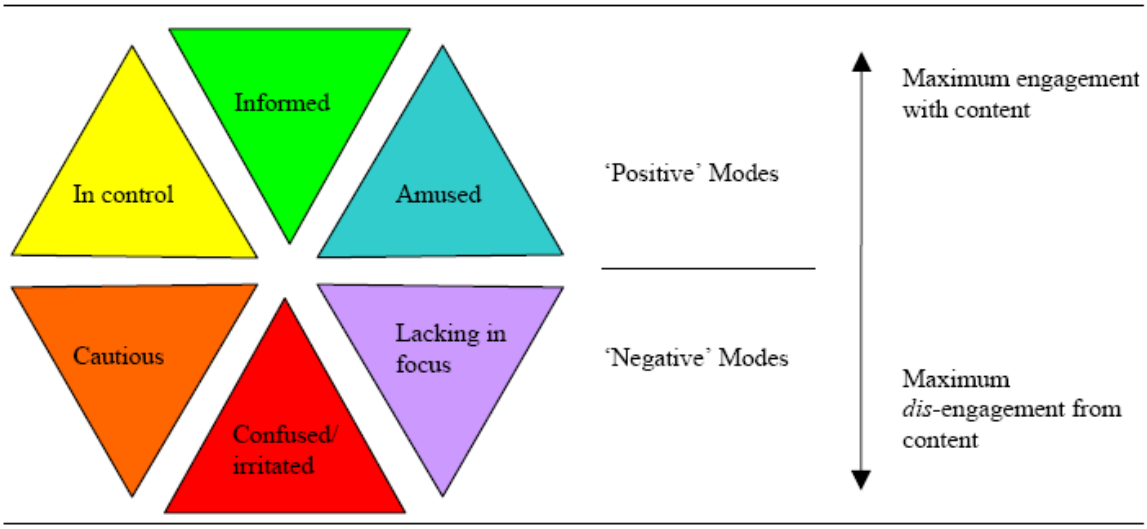
(Preece, Rogers and Sharp, 2002).

All website users experience a range of psychological states that include feelings and emotions when visiting websites on the Internet. Comley and Land (2007) believe that while various factors such as personality, competence and the speed of the connection may predispose individuals to certain states, they prefer to emphasise that these states or "modes" are largely determined by the immediate context of the subject with which the user is engaged. These researchers have developed what they call a "modal" theory of website user behaviour, a typology of emotions and attitudes that allows an observer to explain a user's mood at all times in terms of one or other of these six "modes" or psychological states (three of which are positive and three of which are negative). The

ultimate purpose of this model is to provide a means of moving users from negative states such as confusion or irritation to more positive frames of mind such as enthusiasm or amusement (as depicted in Figure 2.5).

Comley and Land (2007) assert that website users who experience positive modes while interacting with a website, will, as a result, become highly engaged with the content of that website. They suggest, on the contrary, that website users who are dominated by the three negative modes depicted in the model shown in Figure 2.5 (below), are likely to experience maximum disengagement from the content of the site. High levels of engagement are indicative of high levels of user satisfaction, and high levels of user satisfaction increase the probability (1) that users will remain on the website for longer than they would remain on a website that gives them little satisfaction, and (2) that they will return to the website at some time in the future. Both these probabilities increase a website's desirability or "stickiness", which is the ultimate goal of the website designer.

Figure 2.5: Comley and Lang's six user modes of website usage



Source: Comley and Lang (2007: 4)

The three positive modes or states of mind that Comley and Land (2007) believe will produce maximum user engagement with the content of a website are:

1. a sense of being in control on a website
2. a sense of being well informed by a website
3. a sense of being amused or entertained by a website

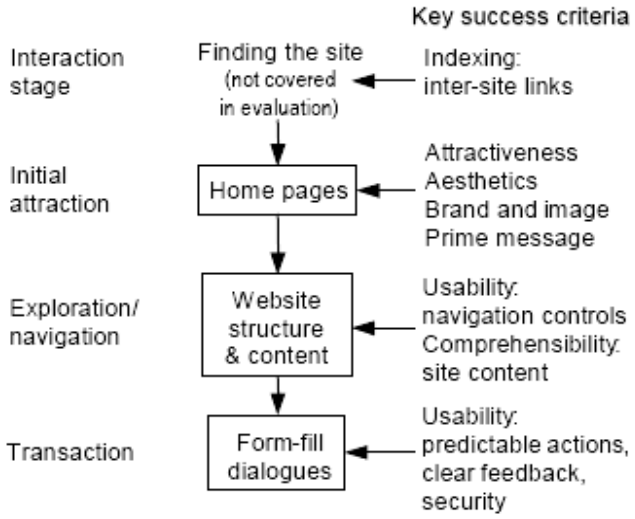
The three negative modes or states of mind that Comley and Land (2007) believe will produce maximum disengagement from the content of a website are:

1. a sense of having little focus or control
2. a sense that a website is a cause of confusion and irritation
3. a sense of being made cautious or doubtful by a website

Figure 2.5 (above) shows how these mental states can be diagrammatically arranged in opposites because the mental states or modes that they represent are psychologically different from one another.

Sutcliffe (2002), moreover, emphasises that website designers are rightly concerned with creating the kind of aesthetic appeal that will attract users. He believes that if users are repelled, offended, angered or irritated by the aesthetic factors of a website, operational usability will count for little and few users will return to the site. My own attitude is that the attractiveness or appeal of a website is a result or function of obtaining the best possible match between targeted users' habitual modes of self-expression and communication, their motivations, interests, desires, needs and requirements – and the physical design features of the website itself. What is extremely attractive and appealing to a punk-rock acidhead teenage Goth might be repellent and irritating to an elderly and conservative CEO of a global engineering company. Sutcliffe (2002) illustrates this matching principle by relating the attractiveness and usability criteria to the stages of interaction with e-commerce websites as an example. This is illustrated in Figure 2.6 (below).

Figure 2.6: Attractiveness and usability criteria during the stages of interaction



Source: Sutcliffe (2002: 1840)

Sutcliffe (2002) therefore suggests the following generic heuristics for measuring the attractiveness of website design:

- A judicious use of colour
- A selection of media to attract attention
- The use of depth of field
- A well-structured and consistent layout
- Symmetry of style and presentation
- The incorporation of unusual or challenging (but relevant) images
- The use of personality in media to attract and persuade

(Sutcliffe, 2002)

The addition of anthropomorphisising features to computer interfaces has already been discussed in some detail. While the judicious use of such features can be employed to optimise the user's experience of interaction, Walker, Sproull and Subramani (1994) warn that the careless or overenthusiastic condition of human characteristics such as faces, voices and facial expressions might well antagonise users and transform their interaction with the website into a negative experience. Walker, Sproull and Subramani (1994) further

state that the anthropomorphisation of interfaces involves at least two activities – making interfaces easier and more comfortable to use by projecting the elements of a coherent but subliminal human temperament onto the interfaces. These suggestions lead one to the conclusion that the achievement of making interactions more pleasurable for users (and therefore more profitable for the owner of the website) does not require the incorporation of every conceivable kind of technology, gadget, gimmick and online diversion. What they imply is that the "seduction" of the user is much more likely to be achieved with the use of a subtle and thoughtful approach that pays careful attention to whatever features are most likely to exert a favourable but unconscious influence over the targeted user.

Brinkman and Fine (2005) support these contentions by arguing that the traditional focus on *performance* in product design might be too narrow, and that more attention should be paid to factors such as incorporating whatever aesthetic elements are more likely to appeal to the typical user of a website. They also suggest that more attention be given to what is comforting, interesting and amusing (within reason) to a typical user (with due regard to the purpose and function of the website concerned). Brinkman and Fine (2005) argue that website designers would become far more effective if they were to pay more attention to ways of reinforcing the self-image and augmenting the self-esteem of the user for whom the website is being designed. They suggest that website designers need to become more skilled in matching what is technically possible with the emotional needs and habitual psychological modalities of the user. All these factors, they believe, can work together to produce user interfaces that are far better matched to the needs and desires of the typical website users.

Since many computer users are notoriously fickle in their online allegiances and loyalties, the probability that a website or any other medium will be able to continue to attract the same group of users if its interface is unsatisfactory with regard to content, navigation usability and aesthetic appeal, is remote indeed (Heba, 2007). An interesting but idiosyncratic approach to website design has been suggested by Heba (2007) who advocates the use of the mystical Chinese art of object placement – *feng shui* – and the use

of the principles of maximising *chi* in particular, as a set of principles for determining the correct paths of navigational flow in website design. He states that a website will function optimally if the *chi* is harmoniously related to the identity or *personality* that the website strives to portray. He notes that there are several ways of portraying identity, and that these include the use of a meaningful logo and digital branding.

Heba (2007) explains that identity in *feng shui* is established through establishing a harmonious complex of relational combinations between a person and the sun, the moon, the stars and the earth, as these are understood in Chinese mysticism. While this is unlikely to appeal to the scientific and research-based preferences of the majority of Western website designers, it offers an alternative cultural insight into the importance of trying to establish the correct *affinities* between website users and the elements that they will encounter on a website, as well as the importance of the harmonious distribution of elements in design and the way in which they relate to the other elements of the interface. Heba (2007) also explains how there are clear rules in *feng shui* for applying colour combinations to the features of a website in order to establish a clear identity or personality for the website. Without the mystical accretions of Chinese philosophy, this is precisely what Western website designers are trying to achieve. Colour is one of the most important features on any website, and combinations of harmonious colours exert a powerful and often subliminal effect on a viewer. A brief overview of the use of colours, their application to business contexts, and the emotional responses that they typically evoke, can be found in Marchetta and Reynolds (1998), and it is summarised in Table 2.2 (below).

Table 2.2: Colours, the emotions that they evoke, and their typical business application in website design, branding and self-presentation

Colour	Corresponding emotions	Their uses in business applications
Red	Aggressive, passionate, strong, vital, determined, assertive	Used for accents, bold statements and to stimulate appetite and interest.
Pink	Feminine, innocent, soft, healthy	Used for feminine associations. Also used since the 1960s as the identifying colour of

Colour	Corresponding emotions	Their uses in business applications
		gay and lesbian organisations.
Orange	Fun, cheerful, warm, exuberant	Used to highlight information, attract attention and to suggest high levels of energy.
Yellow	Positive, sunshine, cowardice, power	Used to appeal to intellectuals and for accents.
Green	Tranquil, healthy, fresh	The deeper tones of green are used to convey status and wealth. The paler tones of green are soothing (they are often used in hospitals). Green might also suggest environmental and outdoor concerns.
Blue	Authoritative, dignified, secure, faithful	Used to project a sense of fiscal responsibility and security. Blue is the most universally popular colour.
Purple	Sophisticated, expensive, royal, mysterious	Used to attract upscale, artistic audiences. Also used to suggest religious concerns (it is the priestly colour). Too much purple can easily overwhelm a viewer.
Brown	Utilitarian, earthy, "woodsy", subtle, rich, grounded	Often used to signify less important items. A good choice for environmental websites.
White	Pure, truthful, contemporary, refined	Dark colours can be enlivened when they are surrounded by white space. White can either be refreshing or sterile.
Gray	Sombre, authoritative, practical, corporate	Used to essentially conservative audiences. Gray is often the choice of people who work under a great deal of stress. It can be a good accent for neutralising bright colours.
Black	Serious, distinctive, bold, classic	Used to create dramatic effects and an excellent background colour.

Source: Marchetta and Reynolds (1998)

Colour is one of the website designer's most fundamental tools for creating an identity or personality for a website and its ability to evoke moods, attitudes and emotions makes it an essential part of the web designer's armamentarium. In addition to this, it is vital for designers of website interfaces to remember that vision is the dominant sense for sighted individuals, followed by hearing and touch. This basic physiological fact about human beings suggests how important colour is for users, and the great potential that colour and its application have for increasing the impact that the website will make on its targeted users. While organisations naturally prefer to see their corporate colours on the company

website, the implications of this are quite serious if the colours that were originally chosen to represent the organisation are unrepresentative of the company or organisation's business and mission. A good website designer will therefore be careful about incorporating a company's traditional colours uncritically on the organisation's website. While it might require a carefully constructed presentation to convince management that its traditional colours convey an image that is seriously at odds with the company's mission, most executives are willing to listen to such suggestions, and it is not uncommon these days for even very large companies (such as British Airways a few years ago) to sanction a complete overhaul of the organisation's image, branding and self-presentation. Colour is one of the most fundamental aspects of any organisation's image. If companies were more aware of the power of colour to project their business and self-concept, they would be much more circumspect about the colours that they accept for the purposes of their self-presentation.

Marcus (2001) believes that a well-designed user interface can convert a casual visitor into a potential customer, and that the culture and personality projected by that website will influence this process. He also believes that website designers should take the culture, habits and attitudes of the target audience of the site into consideration when they are designing the site. Carliner (2006) quotes Marcus as saying that an emerging trend among companies to change their corporate cultures so that they will reflect the values and practices of their clients and website users more closely. Issues such as appeal, brand, culture, identity and personality are becoming more and more important in the fields of user interface design, website design and human computer interaction studies. Tan Tsu Wee (2004) estimates, on the basis of a study carried out by Plummer (1984), that as far as brand personality, for example, is concerned, only about half of the client's perception can be controlled. The other half, he argues, is influenced by the collective values and cultural system of which the individual is a part. This confirms the earlier conclusions of Marcus (2001).

This research tends to support my assertion that websites will be far more effective if designers make them more user-centred and if they pay more attention to the following three aspects of the website itself:

1. the human personality that the website projects
2. the specific human temperament that suffuses the website
3. the cultural background mediated by user interfaces and websites

Kostov, Fuduka & Yanagisawa (2001a and 2001b) came to the conclusion that users tend to prefer graphical interfaces that reflect a greater frequency of *emotional* faces – provided that the emotions thus portrayed complement the dynamics of their own personalities and correspond to their own personal preferences. The findings of this research support the view that it is important for the designers of user interfaces and websites to pay particular attention to the incorporation of whatever design features will project the human temperament that is most likely to elicit specific emotional reactions in typical users.

Marcus and Van Dam (1991) are of the opinion that user-centred design is the key to the evolution of user interfaces because the whole purpose of a user interface is to facilitate user-computer communication by arranging the hardware, software and the linguistics of an application in such a way that it will promote a fruitful dialogue between user and computer. While human dialogue uses gestures, speech and images, such factors only make sense in the context of shared knowledge and a common set of assumptions. The rapid development of technology has made it possible for human beings and computers to share a multimedia vocabulary, common knowledge and shared assumptions. Marcus and Van Dam (1991) point out that it is important to always bear in mind that users will often prefer simpler sets of functions with good user interfaces to larger sets of functions with cumbersome user interfaces.

What this suggests is that even though the necessary technological enablers might be readily available, it is neither always wise nor necessary to utilise technological means that are too complicated and confusing to establish a ready rapport with a user. An

attractive look and feel in a user interface might well be as important for its success as is its functionality. Marcus and Van Dam (1991) quote the views of the anthropologist Claude Levi-Strauss (who called human beings "toolmakers" and "symbol makers") when they argue that the website or technological user interface might well be the most sophisticated of symbolic human structures because it minimises the distinction and boundaries between tools and symbolic content.

User interface design has made a great deal of progress since the 1980s. In this section I have described how a number of researchers have pondered the possibilities inherent in making computers more like humans. The discussion in the section suggests that website designers will be far more likely to produce powerful and effective interfaces for their clients if they deliberately incorporate the features of specific human temperaments in websites and technological interfaces. Since temperament is an inescapable part of human personality and since human beings inevitably respond to signs of personality in other human beings and even in animals, plants and in inanimate objects such as cars and computers, website designers should position themselves to exploit this oddity of human evolutionary development to the full. The following section will examine the question of website personality in greater detail.

2.7 Website Personality

Even though every feature of a website may be technically and unassailably correct and although most viewers may be pleased with the resultant effect, there will still be some users or visitors who will still feel uncomfortable with the general "aura", atmosphere or "feel" of a website. Hunter (2006) suggests that there are particular definable elements of websites that make them comfortable, attractive, interesting and "sticky". When these elements are present, a relationship is established between the user and the website. Chen and Rodgers (2006) argue that "websites have the potential to develop relationships with customers". But since some websites are so powerful that they are able to function in a quasi-human way in the relationship between website and user, it is important to consider how the elements of human temperament or personality can be exploited to define and

perpetuate a relationship with users that will be profitable to the owners of the website concerned.

Two studies undertaken by Chang, Simpson, Rangaswamy, and Tekchandaney (2002) and Chang Coupland, Simpson, Rangaswamy, and Tekchandaney (2003) produced additional evidence that people tend to treat websites as social actors and that they therefore apply multi-dimensional social attributions such as personality to websites. They also found that too much attention to the purely *functional* design elements of a website and too little attention to its human personality or temperament could actually reduce the ability of a website to develop a long-term relationship with its clients and users, and that this would be to the detriment of the company, individual or organisation who had commissioned the website in the first place.

Cober, Brown, Keeping and Levy (2004) created a model that is able to predict user attitudes and behaviours by analysing how they respond to and interact with website characteristics. They also conclude that users are initially most affected by what they call the "façade" of the site, which they define as the site's "aesthetic and playfulness features". They maintain that these aesthetic and ludic elements provoke affective reactions and perceptions in users that influence their search behaviour and attitude, and that these in turn determine the attractiveness rating of the site.

An example of a technological enabler in the design of software (or a website) is a frequently used engineering tool called ***personas*** (Feldstein and Neal, 2001). This tool enables designers to identify the most important characteristics of their users (who are the target audience of the site) and, as a result, to design a website that will accurately accommodate the needs and intentions of such users. If a company is able to accurately identify their website's target group (which might be as diverse as software engineers, philatelists, skydivers, restaurant owners, mediaevalists, vegetarians or kickboxers), and if they are able to identify the most typical temperament of the average user in that group, it will be possible to design a website that will harmonize with and complement the typical

user's temperament. This will then result in a high degree of user satisfaction. User satisfaction is the main condition for ensuring repeat visits to the site and the establishment of a long-term relationship between the site owner and users. Conscientious attention to the needs, personality and temperament of the average user of a website is the best method for ensuring that a site becomes "sticky" for the right users.

In agreement with the above, a study by Meech and Marsh (2000) addressed two specific social factors (trust and personality) in a model that they constructed with the purpose of enabling designers to personalise interfaces for e-commerce. They argued that users unconsciously personalise websites through interacting with adaptive and "intelligent" interfaces that are increasingly being implemented with software-agent enabling technologies. Meech and Marsh (2000) found that as computer tasks become more complex and more humanlike, the range of contexts to which users were required to respond included aspects of interpersonal and social communication. Meech and Marsh (2000) also assert that current users of computers in education and entertainment are expected to exhibit a high degree of social qualities and skills. They maintain that unless they are able to do so, they will not be able to maintain the kind of consistent and believable interaction with their computers that is necessary to accomplish the aims of the programs to which they are exposed. The social qualities and skills that they are expected to exhibit include a high degree of intelligence in:

- Personality
- Emotion
- Social relationships

(Meech and Marsh, 2000)

Meech and March (2000) identified plausible linkages between personality traits and user preferences. These linkages have potentially useful applications in the domain of e-commerce and in persuasive computing in particular, which can be defined as "computing systems intentionally designed to change a person's attitude or behaviour in a predetermined way" (Fogg, 1999). Research of this kind confirms that the coherent

projection of elements of human personality into an interface has the potential to increase the power of persuasive computing and to influence the behaviour of those users who are exposed to it. Meech and March (2000) conclude by saying that they believe that the ability of e-commerce (and thus, by implication, the design of websites) to establish and maintain relationships, to facilitate trust and to leverage social effects will become increasingly important in future.

Lucente (2000) describes another enabling technology that creates *conversational interfaces* between product "experts" (i.e. e-commerce shopping agents who are knowledgeable, patient and affable) and online shoppers, and notes that such interfaces generate increased sales for the website owners who employ them. Lucente (2000) observes that the multi-model nature of the interaction and the natural human perceptions that are built into each expert's personality make these interactions especially powerful. Lucente's (2000) research confirmed that because shoppers regard these "experts" as having human personalities, interaction with them enlivens the shopping experience for users and results in increased sales. The significance of the research that I have quoted above is that more and more researchers are paying attention to the importance of the "soft" issues in the design of systems, interfaces and websites. In so doing, they enable machines such as computers to replace human operatives because these machines are able to perform whatever tasks the human operatives were performing – but only more efficiently, more cheaply and more reliably.

Kumar and Bensabat (2001) make a strong case for treating a website as a social actor. They point out that one of the major obstacles in the way of online commerce is the inability of most of the shopping sites to engage with users cognitively as well as emotionally. Kumar and Bensabat (2001) note that because online commercial enterprises are aware of the need to make online shopping experiences as satisfying and enjoyable as possible, they are going out of their way to make the online shopping transactions as meaningful, rich, satisfying and personalised as possible and that they are using web interfaces as the primary points of contact to achieve this. Kumar and Bensabat (2001)

conclude that the structure of the relationships thus formed is not dissimilar to the structure of interpersonal relationships between human beings. They also note that the success of the means of personalisation built into websites will determine the degree of confidence that users will have in the ability of websites with no direct human components to create and maintain a high level of quasi-human interactions.

Zhang, von Dran, Small and Barcellos (1999) point out that the challenge in the web environment is to identify those design features that will be most likely to attract users to the website and that will – more importantly – encourage them to return to the website at some time in the future. In their research, Zhang, von Dran, Small and Barcellos (1999) tested the assumption that it is possible to apply an analogy of Herzberg's two-factor work satisfaction theory to the web environment. Herzberg's theory describes factors whose absence leads to dissatisfaction as "hygiene factors", and factors that increase satisfaction and that are more intrinsic in nature as "motivators" (Zhang, Small, von Dran and Barcellos, 2000). Their research shows that hygiene factors are those that create and maintain the basic architecture and content of the website. While the presence of hygiene factors makes a website useful and serviceable and excites no comment, their absence would very soon become evident to a user and thus give rise to dissatisfaction, irritation and impatience. Motivating factors, on the other hand, are those that increase satisfaction by adding value to functional elements and by making as strong an appeal as possible to the aesthetic, cognitive and emotional preferences and prejudices of the user. A strong projection of the temperament of a website therefore serves to strengthen the motivating factors of a website.

Karsvall's (2002) research indicates that personality factors do indeed influence the interface design preferences of users, and he points out that research in both psychology and aesthetics has connected extroversion to the specific visual design attributes such as high colour contrasts, saturated hues and bold or sharp-edged shapes. He found that de-saturated colours, green hues and thin or rounded shapes, on the other hand, suggest introversion. His study also confirmed that users are in fact able to recognise and identify

the intended extrovert and introvert features in the interface that has been created by using elements of visual aesthetics to project the presence of a human personality onto a website.

Further evidence of the extent to which websites can be imbued with the attributes of a single human personality has been produced by Marsh and Meech (2007). They in fact speak about a website as an "interaction agent". Where this happens, a website behaves as though it were an independent "human" agent who is able to maintain a continued "conversation" with a human user because it is able to exhibit and observe the necessary social norms and skills that are mediated by agent-based technologies. These website agents have been designed to create and recognise concepts of self and other, ethics, morality and trust, and they also have both verbal and non-verbal communication skills. Marsh and Meech (2007: 3) address the ethical issues raised by this type of agent in the following words:

> Certainly, humans anthropomorphise, even expert users do this; even if they know they are talking to a computer [or a car, or a toaster]. We argue that, if this makes the interaction more comfortable, less impersonal and more worthwhile to the user, let alone potentially fun, there is no harm in that. [author's brackets]

The findings of research that have been quoted in this final section of the literature survey lead one to the clear conclusion that the concept of website personality is already a concept of fundamental importance for the science of human-computer interactions, and that a great deal of research has already been undertaken in this field. The present study aims to build on this research and make a modest contribution to this field by reaching further conclusions about how website temperament is absolutely central to the coherent projection of website personality.

2.8 *Summary*

The literature survey that I conducted in this chapter contributed to the theoretical basis of this study by describing and explaining the early pioneering work of Carl Gustav Jung in personality typology and personality theory – work that was subsequently expanded and refined not only by Jung himself, but by a number of other researchers in the field. This was followed by a description of personality theory and Jung's typology of human temperament in particular. I suggested at that point that human personalities could be divided and classified on the basis of individual temperament.

I subsequently used Jung's typology of temperaments to create a temperament characteristics questionnaire that I intended to use to identify the temperaments of particular websites. The questionnaire and the process of its creation will be discussed in detail in Chapter 3. The literature review has made it clear that there is a strong unpredictable relationship between *temperament* and *personality*. So strong is the putative link between temperament and personality that the two words are sometimes used almost as synonyms. I then addressed the topic of human-computer interactions and the potential role of personality and temperament in the facilitation of these interactions. The potential that computers have to mimic the social and psychological aspects of human communication was described as a development of the greatest importance, not only for the present research but also in the technically sophisticated fields of artificial intelligence and robotics.

In this chapter I discussed how the ability to project human temperament by means of a website is fundamentally important for the design of present and future computers and interfaces. I also examined the available literature to find out what it had to say about the possible importance of "softer" issues such as website temperament in the design and construction of websites and interfaces. The literature that I reviewed made it clear that user interface design is the field of study where most of the current research is being undertaken, and that the expectation of researchers is that such research could be enormously valuable in future applications. I also discussed website personality *per se*,

and described its importance and potential application to the concept of website temperament. Since there are indications that website personality might eventually become as complex a field of study as the study of actual human personality, I feel justified in suggesting that this present research should be able to contribute something useful to our accumulated knowledge and present understanding of this field. In the following chapter (Chapter 3), I will explain the research approach and methodology that I used in this study to answer the research questions.

3. Chapter 3 – Research Approach and Methodology

"Research is what I'm doing when I don't know what I'm doing."

– Wernher Von Braun

3.1 Introduction

The objective of this chapter is to explain the research approach and methodology that was used in this research to answer the research questions. The research is concerned with how an individual experiences and perceives the elements of a coherent human personality or temperament in a particular website and how this encourages particular responses to the website concerned. After much deliberation, I decided to implement an interpretive research approach through the application of a case study. The methods of data collection that I applied were questionnaires and personal interviews. I conducted individual interviews with each of the participants after they had completed the questionnaire.

This chapter begins with an in-depth discussion of the research objective. After that, I will define and discuss the research approach. I will then describe how I devised the questionnaire that was used in the research, and the protocols that I followed in selecting the case study data. At the end of this chapter I will provide a list of the websites that I used in this study, and will include a few typical examples for illustrative purposes. This chapter will conclude with a description and consideration of the limitations of this research.

3.2 Research Objective

eSpindle (2006) defines "research" as the process that a researcher engages in "to study and investigate for the purpose of discovering and explaining a subject, theory or event". In this study, I examined and analysed twenty different websites with the help of five

selected participants in order to establish the feasibility of imputing human temperament to websites.

The objective of this research was to carry out a study that would establish whether it is possible to ascribe typical human temperament characteristics to websites, and whether it is feasible, on the basis of such ascriptions, to conclude that particular websites project specific human temperaments.

In order to prepare the ground for this research, for the case study and for the administration of the questionnaire that followed, I undertook a literature survey of available texts with the intention of creating a strong theoretical basis to scaffold the research and its methodology. Topics that were addressed in the literature survey included:

- C.J. Jung – the foremost pioneer of the theory of personality types and typologies of human temperament in Western psychology
- Human temperament and personality, and some later developments in these fields of study that are relevant to human-computer interactions
- Anthropomorphism and the tendency of the human brain to anthropomorphize inanimate objects in the presence of humanoid cues
- The interaction between human beings and computers, and how to optimise conditions for such interactions
- Issues of user interface design
- The determination of website personality and the factors upon which such personality depends

As a complement to the literature study, I collected data by utilising an interpretive research design. This involved administering a tailor-made questionnaire to a select sample of participants and conducting a personal interview with each of them in turn after they had filled out the questionnaire. The participants were given every opportunity during a case study to express their perceptions of and emotional reactions to the sample

of websites that were selected for study. After they had completed the questionnaire, I conducted an interview with each participant in turn and (with the permission of the participants) recorded and transcribed the results. This provided a great deal of qualitative data about the reasons that the participants had for their responses to the questionnaire.

I then analysed the data that I had gathered from the questionnaire and used it, in conjunction with the data that I had gathered from the interviews, to draw interpretive conclusions from the data and thus to answer the research questions that had been formulated at the beginning of the study.

3.3 Research Question

The main research question is:

"Do websites reflect a human temperament?"

This first question was then broken down into the following two subsidiary research questions in order to simplify the subsequent classification and analysis of the data:

- **Can it be shown that websites exhibit introvert/extrovert characteristics?**
- **Can it be shown that websites exhibit emotional/logical characteristics?**

3.4 Research Approach

Gable (1994) asserts that a research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy of procedure. The following section will explain how this "arrangement of conditions" that Gable refers to was undertaken for the purposes of this study. In Table 3.1 below, Olivier (2004) tabulates information technology research methods and their application to goal categories.

● Often used
■ Sometimes used
□ Hardly ever used
○ Frowned upon

Table 3.1: Research methods for goal categories

Method	Technical	Social	Philosophical
Literature survey	●	●	●
Models	●	■	■
Languages	●	□	■
Arguments	■	○	●
Mathematical proofs	●	□	□
Prototypes	■	□	□
Algorithms	●	○	□
Surveys	□	●	■
Case studies	■	●	■
Experiments	■	●	□

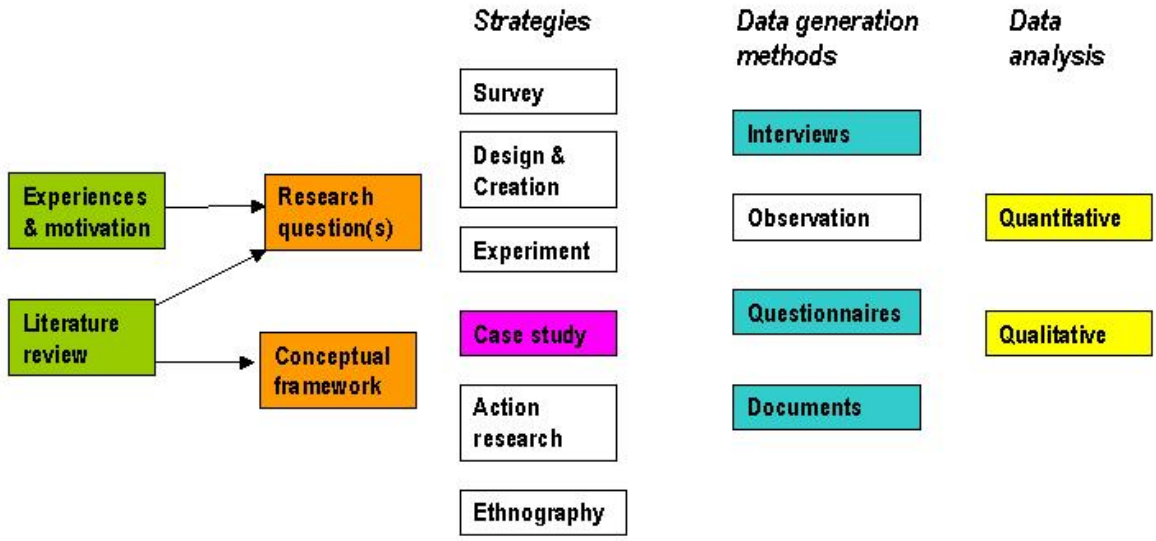
Source: Olivier (2004: 12)

Since this study focuses on the way in which websites are able to mimic human interactions, it was thought that a literature review and a case study would be most appropriate methods to apply under the circumstances. Figure 3.1 below depicts the research process that was followed in this study. It is based on the research process for maintaining consistency that was developed by Oates (2006), as cited by Byrne (2007). The research questions were formulated by combining the conclusions obtained from intense discussion and review with all relevant parties of the topics that are central to this study, with the information and conclusions obtained from the literature review.

In the process of the literature review, I consulted books, academic journal articles and proceedings of conferences, and I then used the information thus obtained to create the conceptual framework for this study. The strategy for the research was thus embodied in a case study. Data for the study was obtained from interviews, questionnaires, the perusal of relevant literature and documents, and the examination of electronic data sources and journal articles. The data collection process produced data that I was able to apply both in a quantitative context (resulting in elementary statistics and trend graphs), as well as in a

qualitative context (which resulted in the combination and interpretation of all the data that had been collected in any format whatsoever).

Figure 3.1: Research process followed



Source: Oates (2006: 33)

Caelli, Ray and Mill (2003) state that a *research methodology* "reflects the beliefs about knowledge and existence that arise from the values in the philosophic framework that is to be employed", and that *research methods* refer to "the tools, techniques or procedures used to gather the evidence". What follows below is a short description of the concepts of the research methodology and the methods that I used for the purposes of this study.

3.4.1 Qualitative and Quantitative Research

Hoepfl (1997) notes that qualitative research "uses a naturalistic approach that seeks to understand phenomena in context-specific settings". Hoepfl (1997) further defines qualitative research, as "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification". Qualitative research is usually used in those cases where the researcher wants to acquire a deep, rich and textured understanding of particular phenomena of the context in which they arise. The process of doing this allows the researcher to construct further theories that can then also be tested by means of further quantitative research.

Quantitative research is "the systematic scientific investigation of quantitative properties and phenomena and their relationships, widely used in both the natural and social sciences" (Oxford, 2001). Quantitative research is often contrasted with qualitative research in the social sciences in particular. Qualitative research uses a number of methods such as observation or case studies to generate data. These are then carefully examined, classified, analysed and interpreted in terms of the research questions that guide the research. It is during this process of classification, analysis and interpretation that the qualitative researcher identifies and clarifies underlying meanings and patterns of relationships between the phenomena that he or she has elected to study – whether they be human beings or events in the world. Although it is usual to contrast qualitative and quantitative methods of scientific investigation, it has also been argued that the two methods complement one another. It is possible even to include elements of quantitative research in what would otherwise be a generally qualitative research programme.

The difference between qualitative and quantitative research is that the latter tends to rely on data that is numerical. The researcher then applies descriptive or inferential statistical methods to analyse the numerical data. The numerical data is generated by whatever empirical experiments the researcher has implemented for that purpose. All quantitative research is guided by an initial theory or hypothesis that defines what needs to be proved. *Counting* and *measuring* are key actions in quantitative methods. Quantitative research produces data in the form of numbers, and these are then usually presented in tables, graphs or other statistical forms that suggest an answer to the main research questions and either a confirmation or refutation of the research hypothesis. The main differences between qualitative and quantitative research are set out in Table 3.2 below, and the implications of these differences are set out for the benefit of this study.

Table 3.2: Differences between qualitative and quantitative research.

Qualitative Research	Quantitative Research	Implications for this study
Qualitative research makes use of multiple realities, which can only be properly understood as a function of the socio-psychological conditions, which define its context.	Quantitative research focuses on a particular problem that that is clearly defined and studied in isolation from the larger reality from which it has been separated.	Since the websites and their hypothesised temperaments are part of a multiple reality, each participant interprets them according to his or her own frame of reference. But the meaning of the temperament projected by the website has been determined in advance by the meanings and interpretations attributed to each quadrant of the resultant temperament graph.
In qualitative research the knower and the known are interdependent and cannot usually be strictly separated for purposes of generalisation.	Quantitative researchers tend to believe in the objectivity of the reality that they study because the numerical-statistical conclusions that they reach exist in the apparent isolation from the larger semantic and existentialist contexts in which the research data and the researchers themselves are exist.	There are number of interdependencies in this study because of the convenience sampling method that I used to select the participants and the website sample. The interpretation of the websites offered by each participant also exists in the context of various interdependencies. Even though this is true of the responses and observations of the participants, there are some elements of objectivity in the classification of the websites.
Qualitative research deals in non-numerical values, and these values and assumptions mediate and shape what is understood.	Quantitative research operates on the assumption that it is usually possible to ignore the non-numerical values and questions of significance raised by the wider context of the research.	Although I have used some numerical data for purposes of summarising my conclusions, that kind of data has no statistical significance or implications. My non-numerical interpretations, on the other hand, were firmly based on the data that was generated by the case study and observations.
Qualitative research usually depends on whether or not it is possible to interpret the interplay of a network or web of multidirectional relationships	Quantitative research is usually based on being able to prove the validity of empirical causes and effects in empirical work in which causes can be statistically	Although notions of causality are inevitable in qualitative research of this kind, it is a causality that arises out of interpretations of the web of multidirectional relationships that evolve from observation of the empirical case study.

Qualitative Research	Quantitative Research	Implications for this study
and events that shape and define one another.	shown to proceed from prior events.	In this research new events arose out of circumstances of the interactions and evaluations that were made.
Qualitative research is usually *sui generis* and cannot be extrapolated or generalised to other times and places, even though they might be similar.	Quantitative research is structured in such a way that its findings can be replicated if the identical conditions of the original research are set up in another time and place.	I used only a small convenience sample for this research because it was not my intention that anyone else would be able to replicate the circumstances of this experiment in any other time or place (although it would be possible for another researcher to use the same methods that I have used to arrive at similar but not identical conclusions). Because this was qualitative research, it was also not my intention to produce results that would be statistically generalisable. If generalisability had been one of my research aims, a different study with much larger and randomly selected samples would have been needed. My research results will therefore only be valid for this study and the individual characteristics and circumstances of the research.
Qualitative research seeks to generate hypotheses from a consideration of the context in interrelationships of the phenomena being studied.	Quantitative research seeks to verify or prove a pre-existing hypothesis.	This research sought partly to discover new hypotheses (one relating, for example, to the trustworthiness of the questionnaire). But it also sought to prove the hypothesis implied by the research questions, namely, that it is possible to ascribe human temperament to a website.

Adapted from Maykut & Morehouse (1994)

The distinctions between qualitative and quantitative research that are presented by Casebeer and Verhoef (1997) with regard to the type of reasoning, type of question and type of analysis usually associated with qualitative and quantitative research respectively, are set out in Table 3.3 (below).

Table 3.3: Distinctions between qualitative and quantitative research

Concepts usually associated with qualitative method	Concepts usually associated with quantitative method
Type of reasoning	
Induction	Deduction
Subjectivity	Objectivity
Meaning	Causation
Type of question	
Open-ended	Pre-specified
Process-oriented	Outcome-oriented
Type of analysis	
Narrative description	Numerical estimation

Source: Casebeer & Verhoef (1997)

3.4.2 Mixed Method Research

Mixed method research is an approach in which quantitative and qualitative methods are integrated (Hanson, Creswell, Plano Clark, Petska and Creswell, 2005). Hanson, Creswell, Plano Clark, Petska and Creswell (2005) define it as "the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially". Hanson, Creswell, Plano Clark, Petska and Creswell (2005) note that mixed-method research has become increasingly popular in the social sciences and that it is considered to be a legitimate form of research methodology.

Gable (1994) notes that it is desirable to supplement qualitative interview data with quantitative questionnaire data for the following two reasons:

1. Such supplementation results in a contextual richness, text and depth that is valuable in theory building and interpretation.
2. Such supplementation improves the internal validity and interpretation of quantitative findings through triangulation (i.e. by supporting validity through independent non-numerical support for the statistical probabilities confirmed by the numerical data).

Quantitative data for this study, which was subsequently analysed with very basic statistical methods such as averages, was collected from the questionnaires that were administered to the participants. I also conducted individual follow-up interviews with each of the respondents and used the data from those interviews, firstly, to confirm the validity of the data collected from the questionnaire, and, secondly, to augment the qualitative data gathered in the interviews.

3.4.3 Case Study Research

Case studies allow researchers to examine phenomena in their natural settings, and they are particularly apposite for the kind of research where researchers are interested in the relationships between particular phenomena in the context in which they are situated (Pinsonneault and Kreamer, 1993). Case studies can be used for a variety of purposes that include description, exploration, prescription and theory building (Gable, 1994).

The case study for this research focused on the reactions of five participants to a select sample of twenty websites, and it make use of both a questionnaire and individual interviews for the purposes of data collection. Before I undertook the case study, I conducted a pilot study with one participant. This enabled me to identify any misunderstanding of the items in the questionnaire on the part of the participants and

also to establish what kind of inductive information the participants would need in order to complete the questionnaire.

3.4.4 Interview Research

Interview research is form of research in which information is obtained by means of questions directed to respondents. I constructed the questions so that they were open-ended. This meant that they allowed the respondents to offer whatever information they thought might be either appropriate or helpful. Palvia, Mao, Salam and Soliman (2003) state that open-ended questions are particularly useful for generating supplementary information (data) about the phenomena that are defined in the research question(s). Crouch and McKenzie (2006) assert that interviewing is one of the research methods that is most frequently used in qualitative research. They also note that since qualitative research methods have become more and more popular and are being ever more widely used, the kind of methodology in which the researcher uses an interview-based format and a small sample of respondents has become the research format of choice for a great number of researchers, especially in education and the social sciences.

"Small sample size" in research such as that which is being undertaken in this study, means a small number of respondents, often fewer than twenty. Since the participants in this study were not randomly selected from the target population, but very specifically selected on the basis of convenience, the notion of a "sample" is not really appropriate to the study. Because the participants were not representative of the target population, they were not, strictly speaking, a sample. I will therefore not attempt to generalise the results or findings of the research to a greater "population" because such a procedure would be inadmissible for research that has been structured in terms of the methods described above. My conclusion will therefore be that the results or findings of this study will be relevant only to those websites and participants which were involved in the present study.

3.4.5 Interpretive Research

According to Olivier (2004), the major goal of interpretive research is to arrive at an "understanding of that which is being studied". Olivier (2004) explains that "understanding" in this context means understanding or knowledge framed in language. Because of this, the findings of the research often depend directly on the meanings that the participants or circumstantial observers attach to what they see, hear and think as they are exposed to phenomena that are the subject of the research. Because findings in qualitative research are directly related to the meanings that people attach to them, one expects these findings to be correlated in the language of interpretation rather than in numerical or statistical quantities.

Because interpretive research rests on the assumption that our knowledge of reality is mediated by the social constructions that are created by human actors and observers, it is impossible to obtain value-free data. It is not permissible to talk about value-free data in circumstances where the researcher depends upon his or her preconceptions and assumptions to guide the research process (Byrne, 2007). And since interpretive researchers become directly involved with the human subjects who are the subject of their research, it is inevitable that they thereby change both their own perceptions and the perceptions of the subjects of research during the course of the research. The observations of interpretive researchers are therefore neither value free nor objective, nor are they meant to be. Interpretive research strives for truth through the coherence, persuasiveness and the plausibility of the linguistic propositions and presentations that represent the findings or results that have been constructed after a careful analysis and interpretation of the data.

The main aim of interpretive research is therefore to understand rather than to predict since the truth which it offers is dependent upon the understanding, assumptions and prior experience of the human beings who are involved in it and the meanings that

they attribute to the phenomena that they experience during the course of the research. It is therefore necessary for the interpretive researcher to understand both the *context* and the *process* of whatever research is undertaken. My objective in this research was to arrive at an understanding of the phenomena of websites and how they might project the elements of human temperament in the interpretations and understanding of the participants. Since the social world is never fixed or static and because all human beings perceive and understand their world subjectively, any kind of objective or generic study would have failed to reflect the experience and individuality of the participants involved in the study. I therefore made use of a subjectively selected group of websites and used the convenience sampling method for selecting participants to take part in the intervention.

3.4.6 The Questionnaire

A *questionnaire* is defined by WordWeb (2005) as "a form containing a set of questions; submitted to people to gain statistical information". I devised a questionnaire for the participants and used it to establish whether or not a trend could be identified on the basis of certain predetermined criteria. I also then applied a very basic form of statistical analysis to the questionnaire so that I would have a clearer picture of the results obtained in the data. (It has already been noted above that the application of statistical analysis in this kind of research is not undertaken for purposes of generalisation: it is only used – where it is used at all – for purposes of clarification and presentation.)

The questionnaire consisted of two sections. Each section contained twenty questions and the participants were asked to answer all twenty of the questions for each of the websites that had been selected for the study. I created the questionnaire after having examined the questionnaires that were available on the Internet for measuring human temperament. The following websites contained questionnaires about human temperament:

- http://www.humanmetrics.com
- http://www.personality100.com
- http://similarminds.com
- http://www.writing.com
- http://www.fisheaters.com

I then modified the questions that I had adapted from the questionnaires available on the websites mentioned above in terms of my understanding of the theory on temperament as described by Meyer, Moore and Viljoen (1990), Fordham (1953), Mol (2004) and Childs (1995). In addition to the above-mentioned sources, I allowed myself to be guided by the recommendations of the clinical psychologist, Peach (2007). I therefore utilised the *thesaurus approach* in the compilation of a forty-question questionnaire whose purpose was, firstly, to identify the introvert/extrovert dimension of temperament under observation and, secondly, to classify the emotional/logical component that was representative of the temperament. The questionnaire ended up by asking twenty questions about the dimensions of the observed temperament. (The complete questionnaire is reproduced in Appendix A.) The overall purpose of the questionnaire was therefore to establish whether or not a trend, pattern or agreement might be identified in the observations of the participants as they scrutinised each of the websites in the sample and answered the questions that pertained thereto.

3.5 The Process of Data Collection

The participants in the case study were selected on the basis of convenience sampling and they included both males and females. Their age distribution was as follows:

- Twenty to twenty nine years old
- Thirty to thirty nine years old
- Forty to forty nine years old

- Fifty years old or older

While some of the participants were employed in the Information Technology (IT) industry, all the participants had been exposed for a varying number of years to computers and the Internet. The sample of participants was chosen specifically to ensure variety in gender, age and level of exposure to the IT industry. This was done in order to avoid giving a particular biographical slant to the data generated by the questionnaire and the results of the interviews.

The participants completed the questionnaire in their own time after the purpose of the study and the necessary instructions had been explained to them and after they had been given opportunities to ask questions. The participants were then given time to read through the questionnaire and ask any further questions about points that they did not understand – points relating to procedure and not to the substance of the questions themselves. The participants were then given a week in which to complete the questionnaire. (The questionnaire that was used in the case study is reproduced in Appendix A.)

After each of the participants had completed the questionnaire, I made arrangements to conduct an informal personal interview with each of the participants within forty-eight hours of their completing the questionnaire. The purpose of the individual interviews was to clarify (where necessary) the responses to questions, and to obtain a general impression of what each of the participants experienced as they scrutinised each of the websites. The interviews were also an important source for the kind of qualitative data and interpretive information that could enhance the quality of data obtained from the questionnaires.

Before the formal commencement of the case study, I conducted a complete pilot study with one of the participants in order to test the comprehensibility of the questionnaire. I also used the information that I gathered during the pilot study to prepare myself for

the briefing session scheduled for the case study participants before they were allowed to complete the questionnaires. I was particularly careful to avoid any kind of leading statements that might give the participants any kind of clue about what kind of interpretation I personally might make with regard to the websites that had been assembled for their scrutiny.

I used the following five categories of frequently used contemporary websites to select the websites that I eventually used in this research:

1. Government websites
2. Bank websites
3. Online shopping websites
4. Social networking websites
5. Search engine websites

I selected *four* websites for each of the above categories of website for evaluation by the participants in the case study. These were websites that were either personally familiar to me, or else they were selected by means of a process that utilised the basis of convenience sampling.

3.5.1 Limitations of the Case Study

The main limitation of the present study is that its results are only strictly applicable to the time, place and participants described in the study. This is a normal limitation in qualitative research with non-representative convenience samples. Since the current study was conceptualized mainly as an exploratory exercise in a field in which very little research had previously been undertaken, the results that it produced were strictly applicable only to the sample of volunteers who participated in the study and the particular circumstances in which the research took place. The findings and results cannot therefore be generalised to a greater population because the sample was in no

way representative of any kind of target population. Apart from the small size of the sample and the fact that it was not representative of any larger target population, my method of selecting the websites and the participants was based purely on convenience and my own subjective criteria and needs (as they related to the purposes of the research). Because of such limitations, further studies would be needed to establish the validity or otherwise of the questionnaire as well as the usefulness and precision of the questions and the information that was sought with a larger and representative group of respondents and websites selected in accordance with statistically sound research procedures.

3.6 Website Sample

What follows below are screenshot representations (four each per category) of the websites that the participants were asked to evaluate. The websites that were selected for scrutiny were selected from the *government, bank, online shopping, social networking* and *search engine* categories, and the screenshots of the websites appear below as they looked on 22 November 2007. They were selected by means of a convenience sampling process for purposes of this research paper.

Government Websites

www.parliament.gov.za

www.labour.gov.za

www.sars.gov.za

www.dti.gov.za

Bank Websites

www.absa.co.za

www.fnb.co.za

www.standardbank.co.za

www.nedbank.co.za

Online Shopping Websites

www.incredibleconnection.co.za

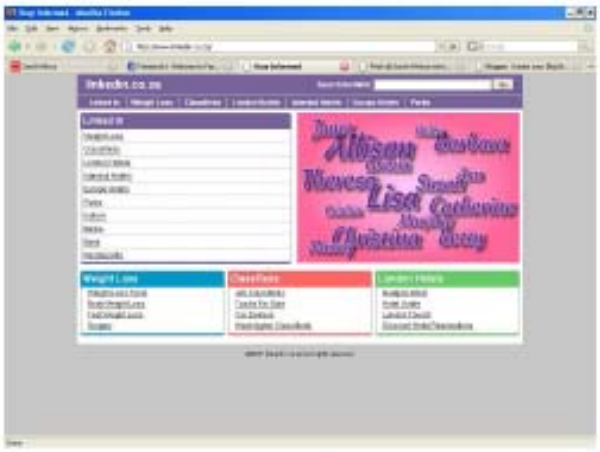
www.woolworths.co.za

www.kalahari.net

www.sterkinekor.com

Social Networking Websites

www.facebook.com



www.linkedin.co.za

www.sareunite.com

www.blogger.com

Search Engine Websites

www.google.com

www.yahoo.com

www.beaucoup.com

www.clusty.com

3.7 Summary

This chapter explained and discussed the nature of the research questions and the particular interpretive research design that was selected for this study. The interpretive research methodology used in this study made use of both qualitative and quantitative data to answer the research questions. Data was gathered by means of a case study, a questionnaire that each of the participants was required to answer, and individual interviews with each of the participants after they had completed the questionnaire. A literature survey was also conducted in order to assess the usefulness and relevance of previous research in this field to the study, and to build up a sound basis of theory for the explication of the phenomena under investigation and the interpretation of the data that emerged during the course of the research.

The data that was gathered can be classified as both qualitative and quantitative in nature since it was based on the different approaches to data collection. The questionnaire, for example, produced *quantitative* data that could be classified and analysed for the purpose of identifying the trends and concepts that are expressed by means of graphs. Because the data that was gathered from the personal and individual interviews was qualitative in nature, the meaning of this data has been expressed in the kind of expository, explanatory and interpretive statements that are conventionally used to express the meaning of quantitative data. This chapter examined the structure of the research, the precise nature of the methodology employed, the methods that were appropriate for gathering data in research of this kind and the limitations of the study. The following chapter (Chapter 4) will explain the case study, the conduct of the interviews, the results that were obtained from them, the way in which the data obtained was collated, classified and interpreted, and how the data thus collected and attested was able to answer the research questions stated in the beginning of this text.

4. Chapter 4 – The Case Study, Interviews and Results

"If men liked shopping, they'd call it research."

- Cynthia Nelms

4.1 Introduction

This chapter reiterates the research objective stated in Chapter 2. After that, it presents the results of the case study, with specific attention to the qualitative and interpretive information that was obtained from the interviews. Apart from the presentation of the research findings, it is the purpose of this chapter to present a decision about whether or not the data that was collected by means of this intervention has answered the research questions that were posed at the beginning of the study. And even though the research questions may have been answered by the data that was collected, the answer it provided will automatically be qualified by the limitations of the study that were discussed in the previous chapter. The main limitation applicable to the study is that it will not be possible to generalise the results because the inherent flaws posed by the nature of the sample make the results unamenable to statistical generalisation.

4.2 Research Objective

It was stated in Chapter 3 that the objective of this study was to establish by means of a case study based on sound theoretical propositions and a survey of the relevant literature and theory, whether or not coherent human temperament characteristics can be ascribed to particular websites in accordance with the emotional/logical and extrovert/introvert dimensions pioneered by C.G. Jung in his theory of human types. The hypothesis was that it should be possible to classify websites in terms of Jung's typology of human types in accordance with the particular qualities that they project because of their design and appearance.

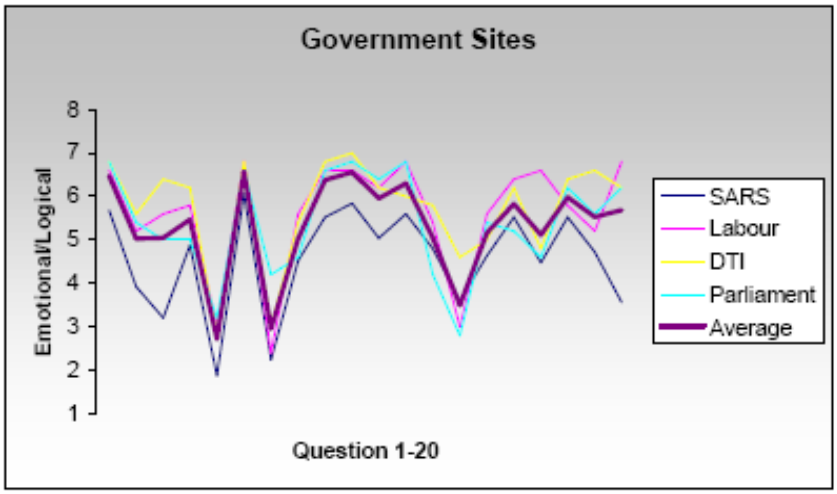
I undertook the study of the theoretical background relevant to this topic by means of a literature survey of all the factors suggested by the research objective. The results of the literature survey were presented in Chapter 2. I then undertook further qualitative research by means of a questionnaire and subsequent interviews with each individual participant in order to generate as much pertinent data as possible for later classification, analysis and presentation. The participants were given opportunities during the course of the case study to record their emotional responses and perceptions of the websites to which they had been exposed.

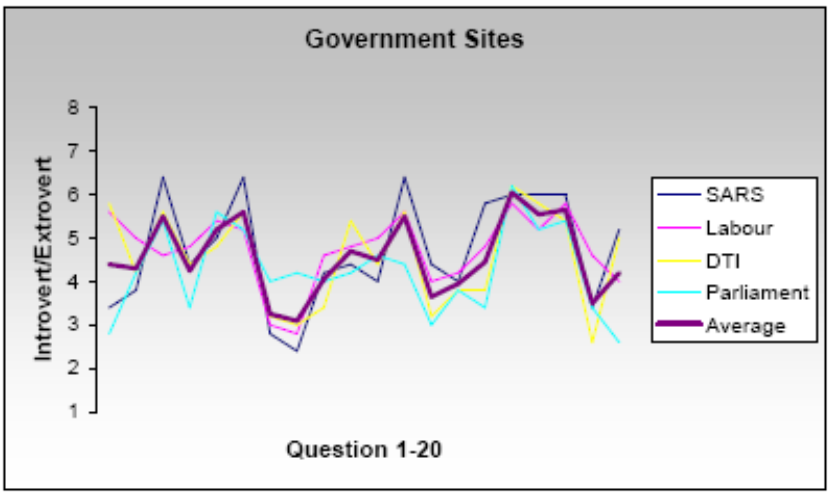
I analysed the data from the questionnaire by using some very basic statistical processes such as the calculation of averages for the different scenarios. This resulted in quantitative data that I used to construct graphs that reflect observable trends. I used the data that I had gathered from the interviews to enhance, support and add richness to the data that I had gathered from the questionnaires. This process of triangulation enabled me to present the data in its final form.

4.3 Interpretation of Research Results

4.3.1 Website representations in terms of website category, per dimension of temperament, based on averages per question for all respondents

Figure 4.1: Average participant reaction to the temperament characteristics of the government websites





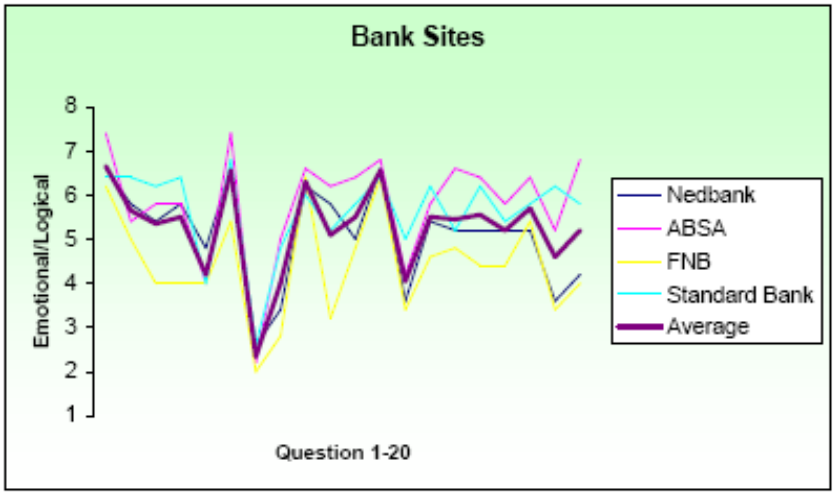
The graph (above top) that shows the emotional/logical dichotomy reveals that the participants identified the government websites on average as revealing a more logical than emotional temperament over the twenty questions for each dimension. The graph (above lower) that indicates the introvert/extrovert dichotomy shows that the participants identified these websites on average as revealing a temperament that is more extroverted than introverted. Additional data from the interviews show that the participants thought that the government websites were *colourful but uninspiring* and not as user-focussed as the commercial sites. Because of this, the participants felt that the government sites were *dry* and *boring*. One of the participants summed up the general feeling about the government sites rather amusingly when he said that they were "…dull and boring [– like an] accountant wearing a Hawaiian shirt".

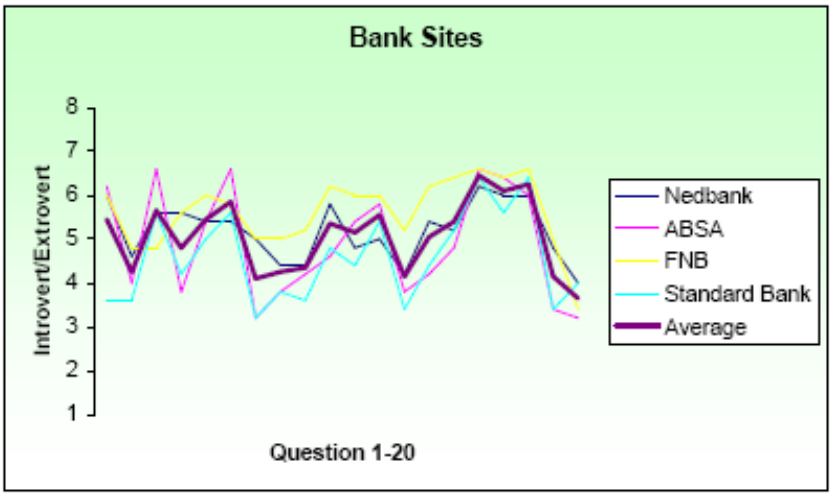
Some of the participants in the interviews felt that the sites were either lacking in important information or that the sites were actually "hiding" necessary information. Others were of the opinion that the sites were not regularly updated and that there were documents that were missing from the sites. One of the participants felt that it was impossible to complete a transaction successfully online (the site in question was eGovernance) and found this frustrating. She felt that it would still be necessary to queue for hours to complete the desired transaction and this made the website totally useless in her estimation. She was also of the opinion that the site was not being used efficiently to communicate with its target audience. One of the participants was so

repelled by the government site www.dti.gov.za that he became quite angry and frustrated. Another participant described the site as portraying "a loud, bombastic person with no substance", and she felt that contact with the site was a horrible and acutely frustrating experience.

This kind of strong emotional reaction illustrates how the wrong temperament in a website design (as in "a loud, bombastic person with no substance") can have a decidedly negative effect on a user, and how important it is to make the temperament of a website harmonious with its purpose right from the beginning. The websites www.labour.gov.za and www.parliament.gov.za elicited the most positive feedback from the participants, who described them variously *as more personal, pleasing to the eye, straightforward, calm, providing the necessary information* and *having an attractive navigation layout*. These descriptions, both positive and negative, can be translated into the terminology of human temperaments, and they indicate the kind of temperament that the users experienced as more acceptable and helpful.

Figure 4.2: Average participant reaction to the temperament characteristics of the bank websites



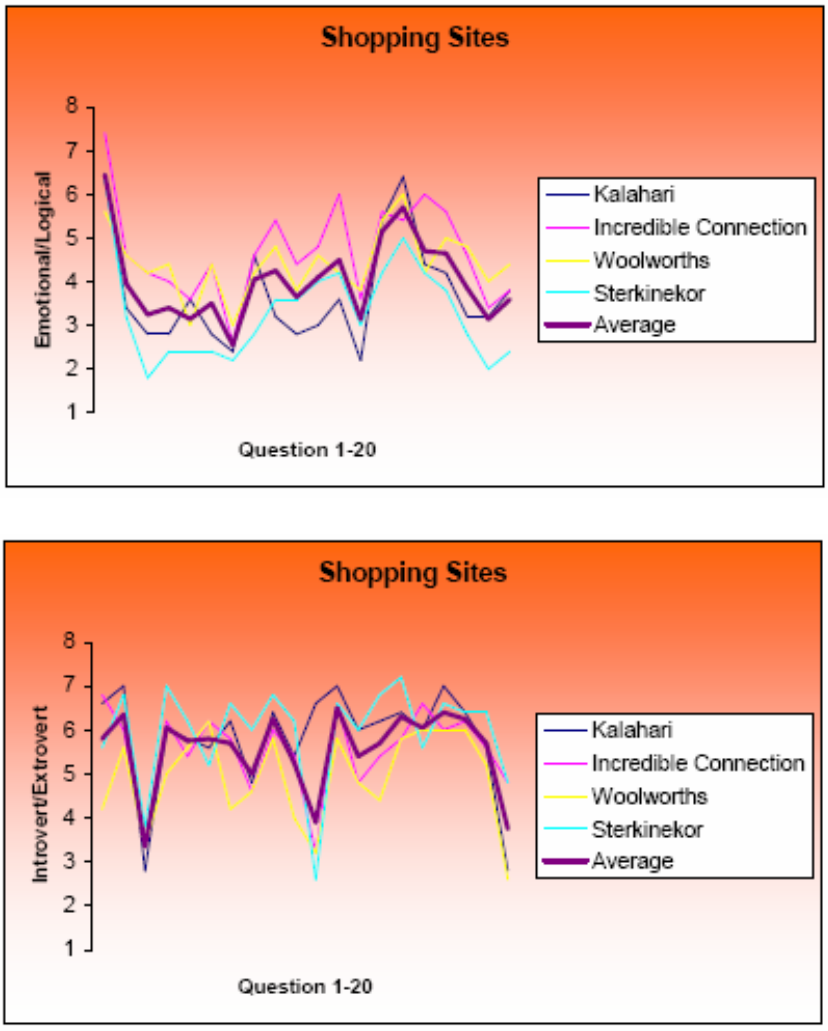


The graph that portrays the emotional/logical temperament dichotomy for the bank websites indicates that the participants felt that these websites were more *logical* in temperament. The participants reacted in more or less the same way in terms of responses to all of the bank sites that were analysed. The graph that depicts the introvert/extrovert dichotomy shows that the bank websites have a tendency to display a slightly more *extroverted* temperament in the estimation of the participants. The data from the interviews show that there were broadly two sets of opinions among the participants in their preferences for the banking websites. One group of participants preferred the www.fnb.co.za website which they described as *more arty, playful, soft on the eye, spontaneous, helpful and friendly*. The other group preferred the www.absa.co.za website, which they described as *structured, logical, more secure, functional, user friendly, easy to use* and *straightforward*, even though sometimes *a bit boring*. The dominant temperamental characteristics of the banking websites were therefore divided in the opinion of the participants between an emphasis on friendliness and playfulness and helpfulness, amenability and dullness. All of them, however, agreed that all the banking websites were *logical* – a desirable temperament trait for a banking site.

Additional data accumulated in the interviews reveals that all the participants felt that it was important for the bank websites in particular to express the temperamental characteristics of *safety, security* and *efficiency*. Some of the participants noted that they reacted positively to the repetition of the banks' corporate colours on their websites.

They felt that this created a feeling of reassurance in the user because a bank's corporate colours on its website symbolises its commitment to the discipline and formality that one expects to encounter in a banking environment. One may therefore add *discipline* and *formality* to the temperamental characteristics that the participants expected the banking websites to project to their users.

Figure 4.3: Average participant reaction to the temperament characteristics of the online shopping websites



The dominant reactions of the participants showed that they identified the online shopping websites as projecting the more *emotional* side of the emotional/logical temperamental dichotomy. Their reactions also reveal that they characterised the online shopping sites as projecting a highly extroverted temperament in terms of the introvert/extrovert temperament dichotomy. Additional data gathered from the

interviews shows that a primary temperamental characteristic of all of the online shopping websites was *efficiency*. The participants identified this quality because each website required users to log in and to state their business immediately and because each of them also presented their products in an efficient and alluring manner.

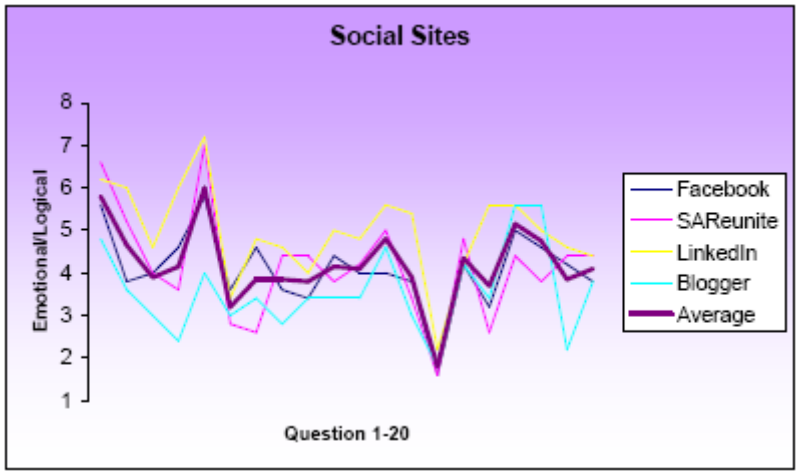
Most of the participants liked the online shopping sites because they identified them as *very appealing* and *interesting*. The participants were particularly attracted to the www.kalahari.net and the www.sterkinekor.co.za websites because they experienced them as *fun, exciting, interesting* and *encouraging a person to shop*. These descriptions can be translated into the temperamental characteristics of the sanguine personality. One participant described the www.sterkinekor.co.za website as *slick, unconventional, entertaining* and thought that it would make *an excellent sales person* – a job typically suited to a person (or website) of sanguine temperament. Another participant characterised the temperament of this website as being identical to that of a successful film star – *flashy, well spoken, glamorous, sophisticated* and *professional*.

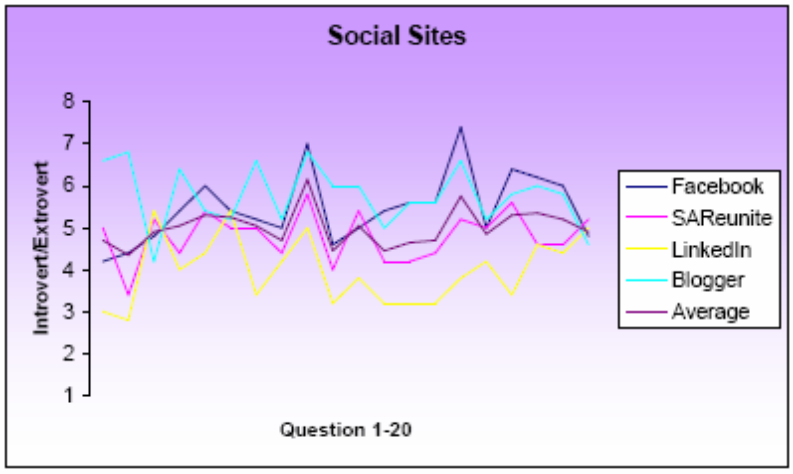
But some of these online shopping sites were described by the participants as projecting the temperamental stereotype of the *rather dull salesperson* because they listed their products and services and very little else. One of the participants thought that the Woolworths site (www.woolworths.co.za) did not project the temperament and image that the stores themselves project and that there was a discontinuity between the Woolworths site and the live experience of their departmental stores. Participants also mentioned *the feeling of security* created by the guaranteed procurement processes of these sites as a positive temperamental characteristic. They also felt that the online shopping sites had all used colour very efficiently on their sites and that this had contributed to the *alluring* and *enticing* temperamental atmosphere of these sites.

One of the participants describes the www.kalahari.net site as a very *clever* site. He also described it as his favourite site because of the temperamental characteristic of *organised chaos* that the website portrayed. This, in his opinion, was an amiable

characteristic that somehow conveyed the feeling that the website *knew its clients* and was *familiar* with their particular needs and desires. These descriptions can be translated into the temperamental characteristics of *friendliness* and *concern about the other*. It is important to note that all the participants valued the functional speed of all the websites as characteristics of the greatest temperamental importance. They noted, for example, that although www.sterkinekor.co.za is a very busy site, its graphics and animations load very quickly. This ability to cope with user traffic indicated to participants the temperamental characteristic of the *efficiency* of the technology that supported the website, and it was generally described in positive terms by all the participants.

Figure 4.4: Average participant reaction to the temperament characteristics of the social websites





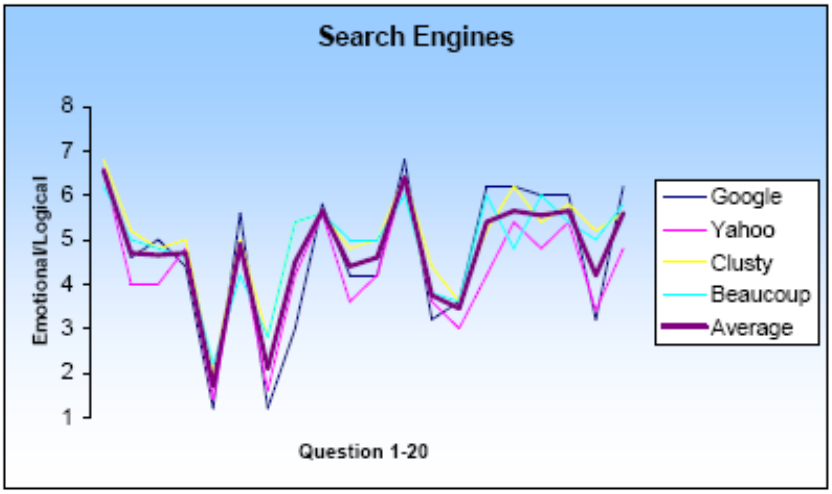
In the eyes of the participants, the social websites tended to project more emotional temperamental qualities and this is shown (above top) on the graph that depicts the emotional/logical temperament dichotomy of these websites. In general, also, the social websites were classified as projecting more extraversion on the graph that depicts the introvert/extrovert dichotomy. A greater measure of variation was also observed in the pattern of answers to questions about this group of websites. Some of the participants pointed out in the interviews that the social websites had made them feel *restricted* and *blackmailed* because all these websites first required users to register before they could actively participate in and interact with website content. This, they felt, might create indirect opportunities for later SPAM attacks. In contrast to this, those participants who were regular users of social websites experienced these websites more positively. In spite of their positive reactions to these websites, the latter group of users all revealed completely different reactions to the websites, even though website functionality remained constant for each user.

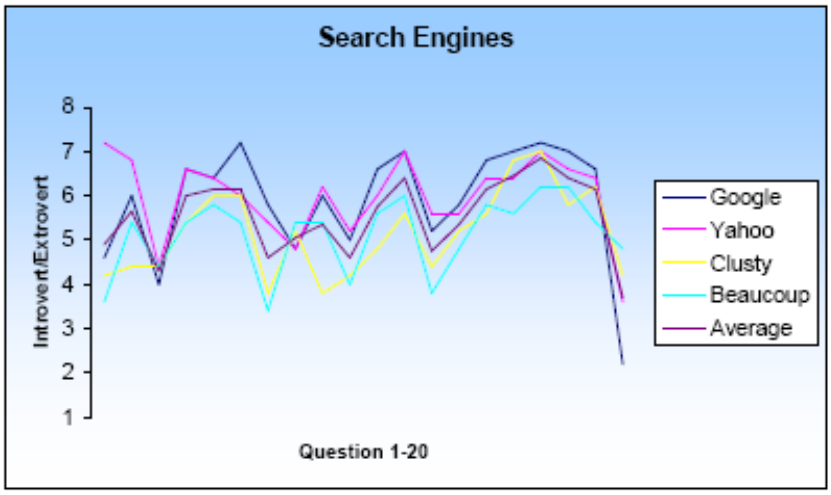
The participants characterised the www.blogger.com website as having *a hobbyist feeling* with useful features such as the wizards that made the website *interesting* and *easy to use*. The www.blogger.com website was described by participants as *more flashy* and *inviting* than the others, possibly because it is designed to attract a target market of teenagers. These descriptions can be directly translated into the sanguine temperament type in the temperament typology of C.G. Jung. The www.facebook.com was also a favourite among participants, mainly because they experienced its interface as *enjoyable*. The participants expanded on their descriptions of this website in the interviews and thought that it might be more enjoyable because (1) it offered so many opportunities for interactivity, and (2) because the minor applications that the website offered to its users for entertainment and enjoyment made it overall more effective. These descriptions of the website could be translated into temperamental terms such as *communicative, entertaining* and *fun*. Facebook also offers a facility that permits direct communication between users. This is a feature that the participants found useful and

important and it can be translated into the temperament terms of *outgoing* and *communicative*.

While it was the general opinion of the participants that the social sites were an effective means of bringing people together, they were generally disappointed with www.sareunite.co.za because it required users to make a payment before they could make contact with the other members on the site. This made the participants feel that they had been *cheated*. A few of the participants also judged this website to be *too neat* and *too structured*. They also thought that it was *too clinical* for a social networking site. In contrast to this, they experienced the other social websites as *more people-orientated* and *more inviting*, partly because they projected a feeling of warmth (which they attributed to an appropriate use of colour).

Figure 4.5: Average participant reaction to the temperament characteristics of the search engine websites





The average attribution of temperament for the search engine websites in terms of the graph that shows the emotional/logical temperament dichotomy tends very slightly towards *logical*. In the opinion of the participants, these same websites project a *more extroverted* temperamental character, and this is shown on the graph that depicts the introvert/extrovert temperamental dichotomy. In this category are websites; most of the participants expressed a strong preference for Google (www.google.com). This was because this website impressed participants as making the most efficient use of technology. (Because it loads so quickly, it is in fact often used for secondary applications such as testing Internet connectivity.) The participants appreciated the website's *lack of clutter*, and experienced this as a positive temperamental trait because it enabled users to concentrate on the actual business in hand (the search) without extraneous interruptions or diversions, and also because, in the opinion of the participants, the website *always produced useful information* (which translates into the temperament characteristics of *efficiency*). The participants described the Google website globally as *straightforward* and *answering what it has been asked*.

Both the www.yahoo.com and www.google.com websites were judged, by the participants, as having a professional image and as being *very neat* and *sleek-looking*. They felt, however, that the www.yahoo.com website was the more inviting of the two because of its useful features such as links to current news. They also felt that Yahoo was the *less robotic* of the two websites. Some of the participants noted that, in their

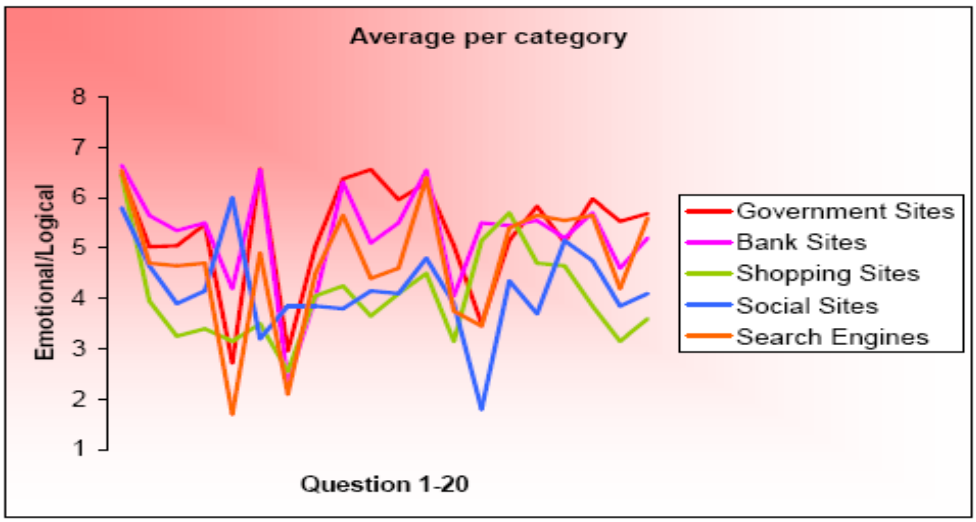
experience, the www.google.com, www.yahoo.com and www.clusty.com returned almost identical results (websites). The exception to this similarity of functionality was their depiction of Yahoo (www.yahoo.com) as having a *more playful* image – which one participant described as *a slightly silly "techie" having fun*.

The www.beaucoup.com website was experienced negatively by nearly all the participants because they felt that its interface was *not sufficiently slick* and *far too cluttered with irrelevant information*. They also described the fonts as *too small* and they felt that users would be disturbed by the fact that the search engine did not utilise the full area of the screen – a configuration that resulted in a *poor presentation* of its returns. This reaction from the participants emphasises the importance of technical efficiency as well as the supreme importance of implementing efficient webpage design principles in the creation of a site so that the emotional reaction that users have toward the website will always correspond efficiently to the website's purpose and intention.

Apart from the reactions listed above, it is interesting to note that the participants all felt that the www.clusty.com and www.beaucoup.com websites were *unattractive* and that the combination of colours that had been used was *unpleasing to the eye* with the result that both these websites were condemned as looking *cheap*. The resultant image, they felt, was one of a website that *does nothing to promote itself* or promote " stickiness". They felt this so strongly that they characterised the www.beaucoup.com in the individual interviews as *misleading* and *deceptive* because of (what they called) "its illogical method" of positioning the returned search results at the very bottom of the page while displaying the "paid for" advertisements at the top of each page.

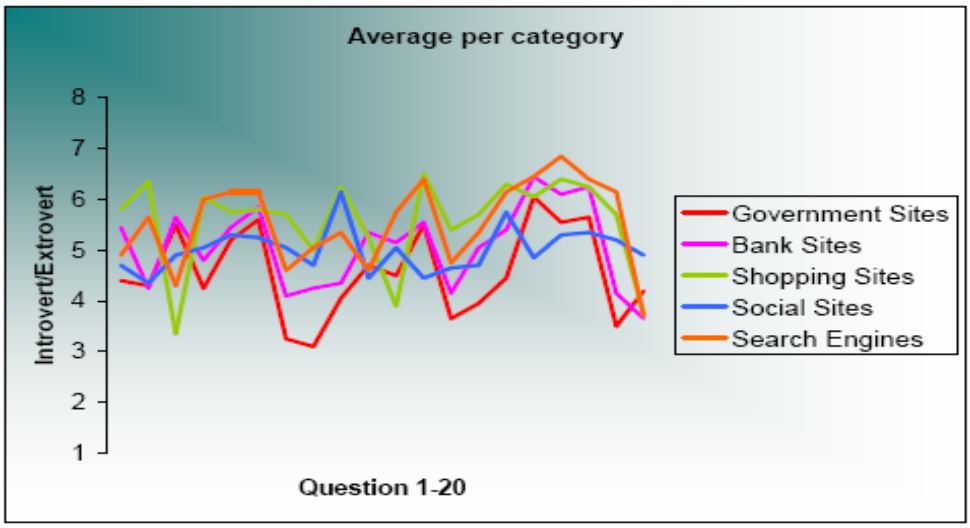
4.3.2 Comparison representations by category of websites per temperament dimension using the average per question over all respondents

Figure 4.6: Comparison of the five categories of websites in terms of the Emotional/Logical dichotomy



On the emotional/logical temperament dimension the online shopping websites display the most emotional trend of all the website categories, followed by the social websites and then the search engine websites. The bank websites and government websites displayed a more logical profile.

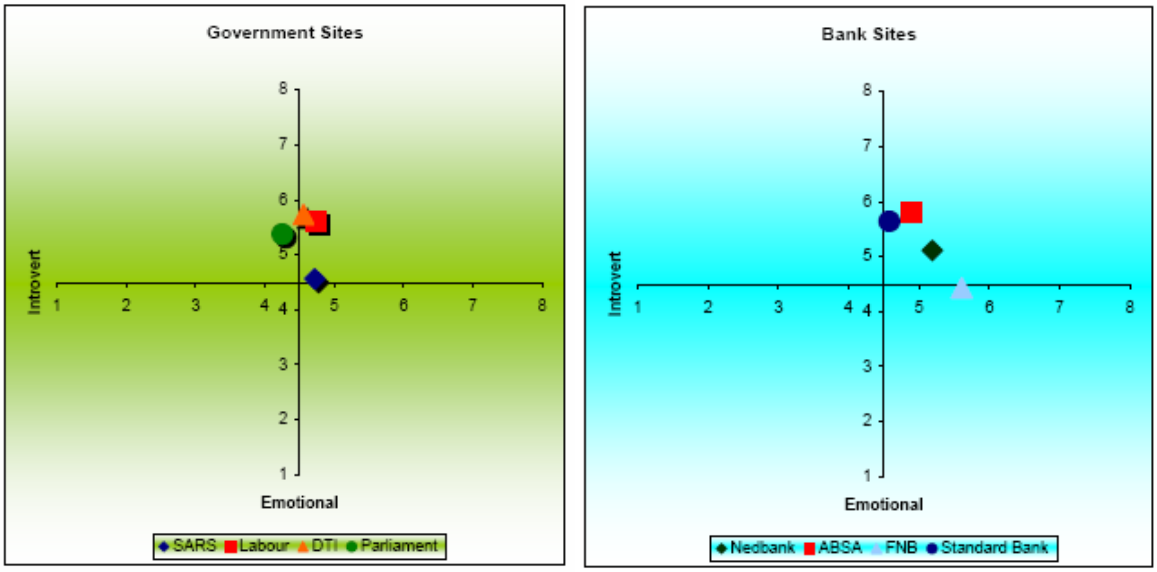
Figure 4.7: Comparison of the five categories of websites on the Introvert/Extrovert dimension



All of the website categories tend toward projection of a more extroverted temperament on the introvert/extrovert dichotomy scale, with the shopping websites and the social websites projecting the highest degree of extraversion among the five categories.

4.3.3 Website temperament by category based of the average for all respondents over all twenty questions per questionnaire

Figure 4.8: Scatter charts indicating the temperament that the participants assigned to each individual website in the government and bank website categories



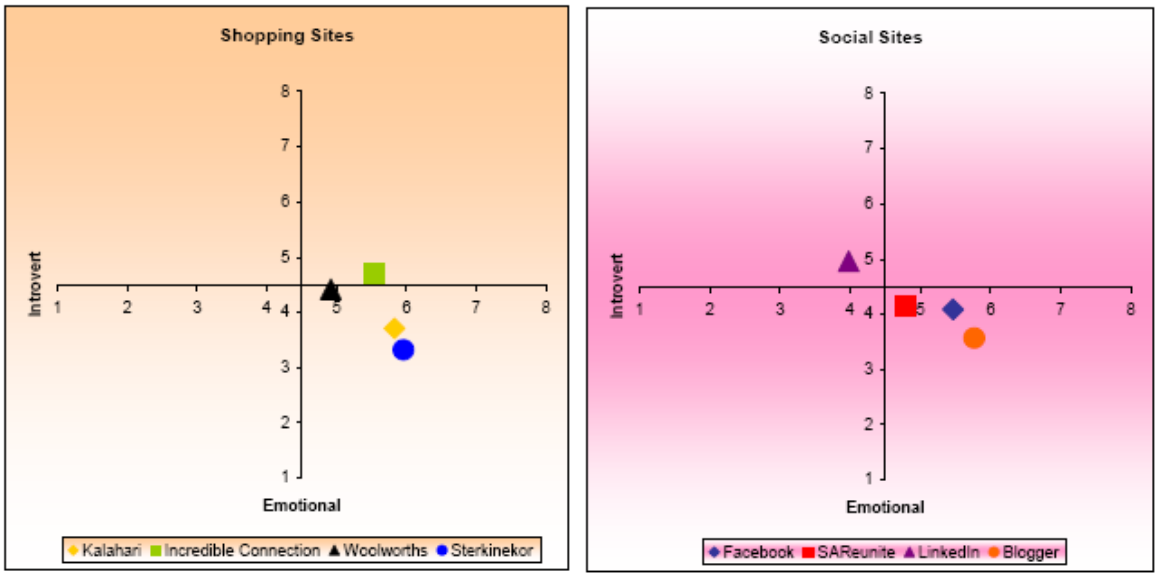
When one analyses the responses of the participants, one sees that they assigned a similar temperament to all the government websites and that the www.labour.gov.za and www.dti.gov.za were, in their view, almost identical to one another. All of the government websites were identified as projecting a more choleric temperament, an assignation that makes sense when one thinks of temperamental similarities among well-known politicians such as George Bush Snr, Robert Mugabe, Margaret Thatcher and P.W. Botha.

The participants also assigned a more choleric character to the banking websites, although with slightly more variations. This is probably a highly appropriate temperament for a bank website if one considers that most banks prefer to project a temperamental image that emphasises their desire to be dependable, trustworthy, strict (security), serious and so on.

Table 4.1: Summation of the kind of temperaments assigned by participants to the government and bank websites

Government website	Temperament
www.SARS.gov.za	Phlegmatic
www.labour.gov.za	Choleric
www.dti.gov.za	Choleric/Phlegmatic
www.parliament.gov.za	Choleric/Sanguine
Bank website	**Temperament**
www.nedbank.co.za	Choleric
www.absa.co.za	Choleric
www.fnb.co.za	Sanguine/Choleric
www.standardbank.co.za	Choleric/Phlegmatic

Figure 4.9: Scatter charts indicating the temperament that the participants assigned to each individual website in the online shopping and social website categories



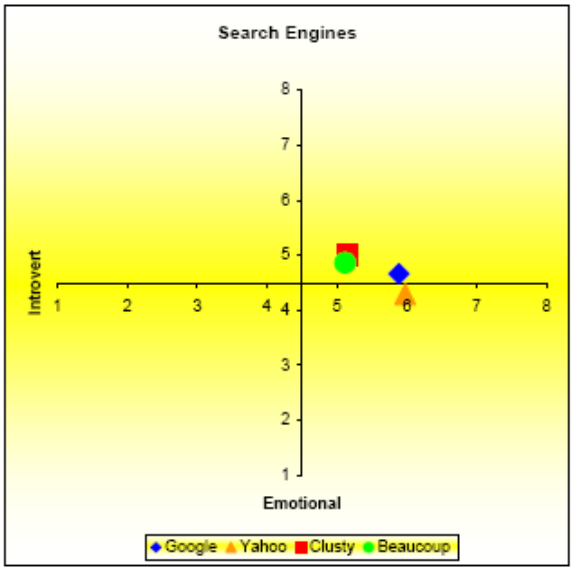
The participants mostly assigned a sanguine temperament to the online shopping websites, with some variations in their reactions to the www.woolworths.co.za and www.incredibleconnection.co.za websites. Since these websites have been designed to persuade visitors to buy, it makes sense that they should be as extroverted, emotional, friendly and inviting as possible.

The participants also identified the social websites as having mostly a sanguine temperament. This also makes sense because these websites have been designed to encourage participation, and social engagement and frequent activity. The exception to this categorisation was for www.linkedin.com, which is a more formal site. The fact that it is more restrained and formal makes sense because this website was designed for the exchange of information in a business and professional environment whereas the other three websites in this category were mainly designed to promote sociability.

Table 4.2: Summation of the kind of temperaments assigned by participants to the online shopping and social websites

Online shopping website	Temperament
www.kalahari.net	Sanguine
www.incredibleconnection.co.za	Choleric/Sanguine
www.woolworths.co.za	Sanguine/Choleric
www.sterkinekor.co.za	Sanguine
Social website	**Temperament**
www.facebook.com	Sanguine
www.sareunite.co.za	Sanguine
www.linkedin.com	Phlegmatic
www.blogger.com	Sanguine

Figure 4.10: Scatter chart indicating the temperament that the participants assigned to each individual website in the search engine websites category



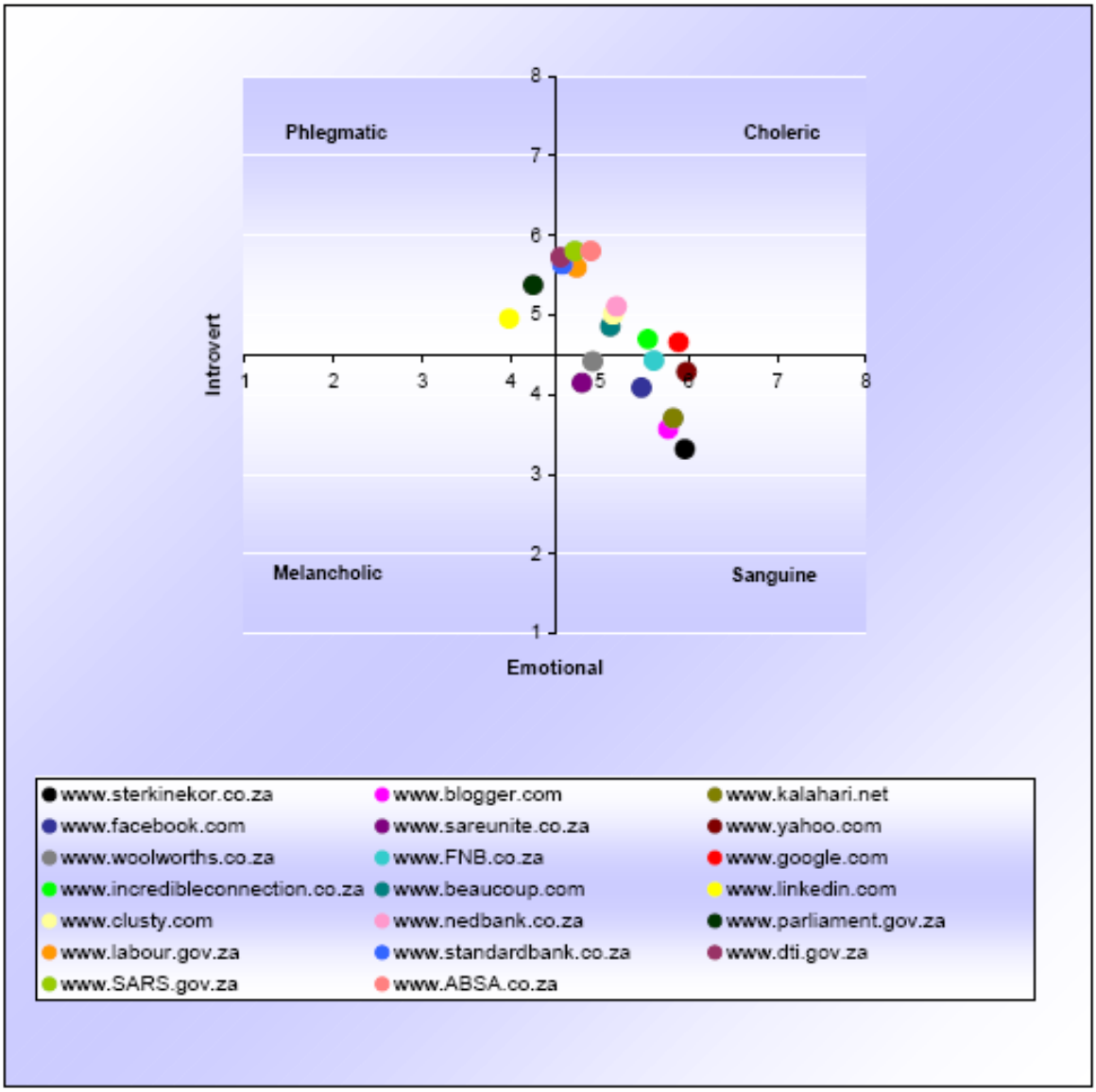
Because search engines were mainly used for academic purposes before the Internet boomed, one might expect such sites to project the characteristics of a formal and businesslike temperament, as www.clusty.com and www.beaucoup.com indeed do. But ever since the exponential explosion in the number of Internet users, the temperament of the average user has become rather more different from what it was when it was mainly academics that used the Internet. The needs of the typical Internet user has, in my opinion, influenced the design of search engines such as www.google.com and www.yahoo.com and made them more *friendly* and *approachable*.

Table 4.3: Summation of the kind of temperaments assigned by participants to the search engine websites

Search engine website	Temperament
www.google.com	Choleric/Sanguine
www.yahoo.com	Sanguine
www.clusty.com	Choleric
www.beaucoup.com	Choleric

4.3.4 Website temperament based of the average of all respondents across all twenty questions per questionnaire

Figure 4.11: Scatter chart mapping the participants' assignations of temperament to each individual website for all of the websites used in the research



The participants assigned an extroverted temperament to almost all the websites with the exception of www.linkedin.com and www.parliament.gov.za. Since it was the online shopping websites that projected the most extroverted and most emotional characteristics, one may conclude that they project a sanguine temperament. If one considers that human beings with a sanguine temperament are more likely to excel in professions such as public relations, marketing and sales, this finding coincides with what one might intuitively expect to find.

One might also expect the government departmental websites such as www.SARS.gov.za, or example, to project a temperament that is more serious and formal than that projected by the www.parliament.gov.za website whose goal it is to be as accessible and user-friendly as possible, not only to average South African citizens but also to potential overseas tourists who are considering South Africa as a possible travel destination.

When one examines the bank websites, they do indeed seem to project an image of what one might expect a typical bank manager to look like – neat, formal, courteous and ready to do business. It is therefore fitting that the participants characterised the bank websites as having a choleric tendency. There was, however, some variation in the way that the participants characterised the temperaments that are projected by the social websites. This variability is entirely appropriate if one considers that these websites attract users for an entirely different purpose.

One may make the same observation about the search engine websites. It is also clear from the differences in the temperaments that were assigned that some of these sites target mainly academics and researchers (www.clusty.com) while others (www.google.com and www.yahoo.com) are designed to attract a more general public and even children.

It became apparent from the supplementary data gathered in the interviews that those websites to which the participants assigned a more sanguine temperament were the websites that were the most popular among the participants. Since a person would normally react to another person with a sanguine temperament in the same way, one is able to confirm that there is a high degree of consistency between the participants' assignment of temperament to websites in the way in which it is possible to classify human beings in terms of the temperament theory of C.G. Jung. The participants noted in the interviews that the government websites generally project a strongly

bureaucratic image (one of the participants associated Jacob Zuma with the personality portrayed by these websites). Since most of the government websites were identified as projecting a choleric temperament, their identifications seem, in this instance, to be highly applicable and plausible since most politicians display temperamental characteristics that one might associate with the choleric temperament.

With the exception of the www.fnb.co.za website, which they characterised as more choleric or sanguine, the participants identified the bank websites as projecting a more conservative temperament, i.e. a typically choleric one. While they identified the online shopping websites as mostly having a marketing and sales approach, all the participants in the interviews identified the www.sterkinekor.co.za site as their personal favourite because it perfectly represented, in their opinion, the power inherent in making an optimal use of technology on a website. And so all the participants reacted positively towards that website. Each of them praised the www.sterkinekor.co.za website and some of them explained how impressed they had been by the fact that a designer could apply technology in such a way on a website that it could result in a good user experience. These enthusiastic reactions confirmed my existing belief that the effective use of technology in the design of a website is supremely important for eliciting a good user experience. Some of the participants also commented on the attractiveness of the website (its "look"), and how the correct application of colour and animation had contributed to the overall effect and good functionality of the website.

In contrast to the good feelings created by the online shopping websites and by the Ster Kinekor website in particular, some of the participants in the interviews characterised the social websites as projecting a temperament that was *rejecting* and *conducive to a feeling of uncertainty*. This was a surprising finding because, with the exception of www.linkedin.com, all the websites in the sample were identified by the data gathered from the answers to the questions as projecting a mainly sanguine temperament – the temperament that is normally associated with people who are popular and fun to be

with. My conclusion was that these negative feelings had been induced by the condition imposed by the websites that required users to sign up (register) and pay a certain amount online before they could enjoy the advantages of these websites. Since the participants were not in a position to do this during the experiment, they concluded, on the basis of their feelings, that the websites concerned were *rejecting* and *unfriendly*.

4.4 The Current Research in the Light of Information Gathered from the Literature Review

4.4.1 Carl Gustav Jung – The Pioneer of Personality Types

My familiarity with the theory of temperaments of C.G. Jung and its ensuing typology of personality types inspired me to find out whether this theory, which is normally used as a basis for the classification of human behaviour, could be applied to inanimate entities such as websites. The results of the study give a strong indication that it is possible to classify nonhuman entities such as websites on the basis of Jung's typology of human temperaments, and that this has important practical consequences for the design of websites and the reasons why human beings react to websites favourably or unfavourably.

4.4.2 The Human Temperament and Personality

I used Jung's typology of human temperament and the personality theory that it implies as the basis for creating a questionnaire that could be used to identify the introvert/extrovert and logical/emotional dimensions of the websites that were included in the research sample. This resulted in a research tool that I was able to administer to participants who are able, as a consequence, to determine, with a large degree of success, the temperament, and by implication, the personality of the websites concerned.

4.4.3 Anthropomorphism

I noted in Chapter 2 that Agassi (1973: 87) defined anthropomorphism as "an inveterate tendency to project human qualities into natural phenomena – consciously or not". The effect of the basic human tendency to anthropomorphize phenomena is clearly visible in the current research because the participants experienced little difficulty in identifying websites in terms of the human temperament, which they projected, as the data from the answers to the questions in the interviews clearly demonstrate. The participants not only ascribed temperament to websites to which they were exposed; they also described the particular feelings and emotions that their interaction with the websites induced in them. In so doing, some of the participants went so far as to attribute purely human characteristics (such as friendliness and antagonism) to the websites themselves.

4.4.4 The Interaction between Humans and Computers

If the growth of technology continues unimpeded into the future, and there is no reason to suppose that it might not, human beings will inevitably be required to interact more and more with computers and with the Internet in particular in the normal course of their lives. Because of the large number of people using websites and surfing on the Internet, the actual design of websites will become more and more important – if only to minimise irritation, confusion, ignorance and antagonism on the part of multiple users. The sheer volume of transactions even now being conducted on a daily basis on the Internet makes it imperative for website designers to be able to create websites that will facilitate rather than hinder and impede the progress of users. The results of this intervention have demonstrated that even the websites of highly regarded institutions and businesses can create unintended positive and negative emotions in users. Since it goes without saying that a user who is irritated and antagonised will be less likely to achieve the result for which he or she consulted the website in the first place, the importance of appropriate design features on a website cannot be overestimated. From data gathered from the interviews, it is clear that users

quite naturally prefer to enjoy efficient, productive and meaningful interactions with those whom they encounter, even when those with whom they need to interact are machines and not human beings. The case study provided useful data about the effect that their interactions with the websites had on the participants. I was able to determine their reactions to the websites on the basis of the emotional reactions (pleasure, irritation, appreciation, alienation, amusement and so on) that the websites induced in the participants and the very human feelings towards the websites that were, as a consequence, induced.

Swinth and Blascovich (2007) define social presence as "the actual, imagined or implied presence of another". The fact that the participants responded with strong human emotions to the differences in the websites confirms my original hypothesis that human beings respond to websites in exactly the same way as they would respond to other human beings who display similar characteristics. On the basis of the experience of the participants that is described and analysed in this research, it becomes feasible to suggest that human beings in general respond to websites as though they are a social presence, and that their responses are determined by their perceptions of the human temperaments that they (mostly unconsciously) assign to such websites. Since the responses of people (on the evidence produced by this research) is identical (whether it be directed towards another human being or toward a website), it is possible (on the basis of these results) to confirm the hypothesis that people who use websites and the Internet react to such locations *as though they were other human beings*, and that the design of the website concerned modifies and determines the reaction of the website user in a positive or negative way.

Shechtman and Horowitz (2003) asked the question: "How is interacting with computer programs different from interacting with people?" Since the research results of this intervention confirm that users clearly perceive the elements of human temperament in websites, it is possible to confirm that the human-computer interactions are in essence identical to human-human interactions in terms of the

emotional responses elicited in the user. In other words, human beings react emotionally and intellectually to websites as though they were real and living people.

In Chapter 2, I advanced the idea that people will on the whole prefer to interact with others who are similar to themselves in personality. If this is true, most people would find interaction with a computer or a website with a similar personality or temperament more satisfying than an encounter with a computer or website that projected a completely different personality from themselves. Since the research makes it clear that it is possible to identify a website's temperament and thus its personality, future research might confirm or disprove the assumption that users prefer to interact with websites that are similar to them in temperament by testing the satisfaction levels induced by the interactions between users of various defined temperaments and a range of selected websites with clearly projected temperaments and personalities.

4.4.5 User Interface Design

Factors such as design and style are becoming more and more important in the design of interfaces and computers. This importance goes beyond current trends and fashions in aesthetics and is based on the need to make websites as "sticky" as possible in an environment where more and more of them are competing for user attention. Evidence for the truth of this statement may be found in the number of comments that participants made about the look and feel of the websites that they examined in this intervention. This tends also to confirm my earlier statement that *sight* is the most important sense in sighted individuals.

I noted in Chapter 2 that the *usability* of a website will be greatly influenced by the mood and the quality of the interaction that a website engenders in a user. Data from the interviews show that participants stated more than once that *the perceived usability* of websites profoundly influenced their experience of those websites, and that this factor was especially important in their selection of their favourite websites.

This research gives a clear indication that website users experience strong feelings and emotions or psychological states while surfing the Internet. The research presents some clearer indications that it was the temperaments that these websites projected that had an influence on the participants' emotional reactions to the websites.

In Chapter 2, I suggested that the best way of making interactions more pleasurable for users would not involve merely packing a website with as much technology as it could hold. My suggestion there was that, by paying careful attention to the appropriateness of the temperament that a particular website projects, it would be possible to achieve an appropriate level of "stickiness". This hypothesis is based on the assumption that website users are influenced mainly by the way in which they react to the human temperament that they unconsciously perceive in the website itself. If this is true, and the results of this research seem to indicate that it is, it is of paramount importance for web designers to understand the dominant temperament of the users who will utilise a particular website and the kind of temperament that will induce a favourable reaction in them and therefore maximise the "stickiness" of the website itself. If a website designer is able to maximise the fittingness of the match between the temperament of the average user and the kind of temperament in a website that will exert the most favourable effect on such users, then it should be possible for designers to create websites that are optimally effective and unlikely to irritate or antagonise those for whom they are designed. Proof for these statements can be found in the results of the present research and especially in the ability of participants to identify the different temperamental characteristics that were projected by websites from similar categories.

This research also provides evidence that although one might ask participants to disregard the performance of the physical technologies embedded in a particular website, it is actually impossible for users of websites to detach themselves *emotionally* from the effects (whether good or bad) of any accompanying technology. This indicates

how important it is for website and interface designers to make correct choices about the technology that is used to support the function of particular websites.

4.4.6 Website Personality

The interactions that people have with one another evoke certain emotional reactions and feelings. These feelings are based on the responses of people to the personalities of those with whom they interact. Because the participants in this study displayed clear and definite emotional reactions and feelings to the various websites that were used for the testing of the hypothesis in the present research, I have come to the conclusion that websites do indeed project humanlike temperaments and, by implication, personalities. This is partly due to the fact that human beings tend to understand and make sense of their environment through a process of anthropomorphisation – of seeing human characteristics and personality in any inanimate object that projects the elements of human temperament.

4.5 Summary

In the beginning of this chapter, I reiterated the research objective and then reported on the results of the case study that was conducted through the application of a questionnaire to a sample of participants selected on the basis of convenience. The results of the case study enabled a few significant concluding remarks. The participants identified the online shopping websites as the ones that projected the most extroverted and strongly emotional characteristics. They identified the bank websites as projecting an essentially conservative temperament that corresponded to the nature of the services and business conducted by banks and that approximated, in human terms, to the personality of a bank manager.

I was surprised by the fact that some of the participants felt that the social websites projected a "rejecting" personality and that they created a feeling of uncertainty and mild confusion – hardly characteristics that one would intuitively expect to be

associated with sites that had been designed to be extremely enticing and alluring in temperament. Because search engines were in the past used mostly for academic purposes, one would expect such sites as these to project a more formal and businesslike kind of personality. The participants experienced the modern search engines in the sample as easier to use, more efficient than they had expected, and even (somewhat paradoxically) more light hearted than they had expected. The participants experienced most of the government websites as inefficient, ineffectual, boring, antagonising and (in short) a waste of time.

In my conclusion to this chapter, I have examined the ways in which some of the most significant findings from the literature survey, the results of which were described in Chapter 2, correlated with the findings of this research. In the next chapter, Chapter 5, I will conclude a study by summarising the findings, evaluating the research study, and make suggestions for possible future research.

5. Chapter 5 – Evaluation and Conclusion

"Reasoning draws a conclusion, but does not make the conclusion certain, unless the mind discovers it by the path of experience."

- Roger Bacon

5.1 Introduction

For the purposes of this study, I examined and described the following academic topics because they had a direct bearing on the hypotheses, conduct and results of this research: C.G. Jung and his theory and typology of human temperament, a more general examination of some aspects of human temperament and personality, the notion of anthropomorphism and how human beings habitually but mostly unconsciously make use of it to understand their environment, the modem consequences of interactions between human beings and computers, the importance of user interface design and the decisive consequences of understanding website personality for achieving the goals and aims of website construction.

Apart from the literature study, I also conducted an interpretive case study by means of a questionnaire that I had constructed on the basis of my findings in the literature survey as well as individual interviews with all the participants. I analysed the resultant data from the questionnaires and used it in conjunction with the data that I had obtained from the interviews to arrive at the interpretive conclusions that I reported in Chapter 4 (above).

In this chapter I will summarise and evaluate the research, locate the contribution made by this study in its context, and answer the research questions by using the conclusions suggested by the analysis of the data. I will then make some suggestions for possible further research and suggest ways in which future research might confirm

and expand upon the findings that have been suggested by the answers to the research questions.

5.2 Summary of research

One may assume that when Jung defined his theory and typology of humans, he probably did not entertain the thought that his theory might one day be profitably applied to the interactions between human beings and sophisticated humanoid machines. One may also assume that those who invented and refined computers had little idea of how completely human lives would become intermeshed with machines and with the personal computer in particular, although early writers of science fiction such as Jules Verne and H.G. Wells were prophetic in their fictional accounts of the effect that future machines would have on the fate of human beings. But with the exponential development of computer technology, the social context in which humans live and work has been so totally transformed by the increasingly sophisticated capacity of these machines that we nowadays tend to react to them (albeit unconsciously) as though they were other living human beings – and it is this observation about the human-machine interactions that formed the basis for this research.

Although the personal computer as a stand-alone machine might never have come to influence the habitual ways in which human beings react to such a great extent, it was the creation and subsequent refinement of the Internet (and all that this implies) that has more fundamentally and radically changed the nature of our consensual human reality in ways that could scarcely have been imagined even a few decades ago. It is the Internet that now allows users to engage in research, shopping, banking – and even the conduct of their social lives. As these influences are become more and more pervasive in our lives, researchers have begun to take note of the extent of the influence that these machines have on ordinary human life. This has led to a situation in which it is now a matter of the greatest importance that the various kinds of technology and the

interfaces by means of which we interact with machines and with one another should function with optimal efficiency and smoothness. Since those who use interfaces on the Internet are spending more and more time interacting with computers and websites both in the line of pleasure and at work, we have now arrived at the situation in which it is not only our comfort as users that is at stake, but also our mental health and psychological equilibrium. While the ill effects of poorly designed technological equipment and interfaces is beginning to be better and better understood, it is still not altogether clear how the increasing levels of intensity generated by more and more time spent online may affect the long-term physical and mental health of human beings. Because of all these problems, the designers and marketers of new technological equipment are paying more and more attention to the problems inherent in designing interfaces that will increase the pleasure and efficiency of online activity and the use of technology. The ultimate aim of research into these problems is not only to increase the safety, well-being and mental health of the people who use these machines, but also to increase the profits of those who are involved in the design of new technologies.

The social and technological environment in which we live has evolved so rapidly that the efficient design of technology and interfaces ideally requires input from specialists qualified in fields as diverse as technologists, psychologists, sociologists and specialists in human behaviour, pathology and related fields. Since we already live in a world where this technology is a reality, it is only prudent for researchers and the organisations that they represent to invest the needed time and energy in those fields of study that will enhance their products and ensure that they will not, either deliberately or inadvertently, damage those who use them on a regular basis.

In this study I have attempted to make a modest research contribution to one of the important realities of the technological society in which we all live and to arrive at the provisional understanding of why it is possible for inanimate technologies to exert such a decisive influence on our mental and physical health and well-being.

5.3 Evaluation of Research Done

For the literature survey, which is described in Chapter 2, I consulted whatever available resources such as books, academic journals, articles and conference papers were relevant to my purpose. I structured the literature review around specific concepts in order to find information that I needed. The literature survey was intended to fulfil the purposes listed below. Each bulleted item is followed by my own supplementary remarks. The purpose of the literature survey was therefore:

- **To show that the author was aware of existing work in area of the research topic**

Human temperament and personality have been studied for decades and in great detail by many authors and researchers. More recent studies have looked at the role of anthropomorphism in human perception and have examined the psychological effect that it exerts on human beings as they interact with machines. Human-computer interaction is a very wide subject. For the purposes of this research, it was important for me to acknowledge that there are many different ways in which the theory of human-computer interaction can be applied in practice because the concept of personality as it pertains to human-computer interaction already exists in this field. The most important area in which this research has been applied is in the field of interface design and psychology, and the psychological factors that have a bearing on technology have already been the subject of many research studies. As is already the case with user interface design, the concept of a website personality and its implications have been examined by a number of commentators, especially from the point of view of technology.

- **To place the author's research in context of what has already been published**

Although a number of studies have already been undertaken in the fields related to the objectives of the present research, I could find very little that dealt specifically with the

topic as I had formulated it. Both Chang, Simpson, Rangaswamy, and Tekchandaney (2002) and Meech and Marsh (2000) have carried out a significant amount of research into the topic of how websites function as social actors and the implications of this knowledge for website and interface design. While the concept of website personality has therefore already been studied and while a large amount of evidence has already been advanced to support just such a hypothesis, no researcher has before now examined how websites may be classified in terms of the temperament that they project on the basis of the Jungian typology of personality types, and the implications that this has for website designers.

- **To give indications of how other theories may be related to the topic that the researcher is studying**

The fields of study that are most relevant to the present research are largely those in areas such as artificial intelligence. Researchers such as Moon and Nass (1996) in particular have carried out research that is relevant to the topic of this study. Other relevant theories that support the study are those of Marchetta and Reynolds (1998), which investigated the significance of human emotions for the interface design process. Marcus (2001) has done a great deal of research into how the correct application of emotional dynamics can exponentially increase the "stickiness" of websites.

- **To suggest theories that might explain the data that has been gathered**

Jung's typology of temperamental types and its subsequent application and expansion in psychology and other fields is the key to comprehending what current research is trying to achieve. A proper understanding of this theory enabled me to create the tools that I used in the conduct of this research. It was also the basis for my understanding and interpretation of how the participants reacted to the websites in the sample. Apart from this theory, there is a whole body of theory that has been created by researchers into human-computer interaction and user interface design that gave me the necessary understanding to make meaningful interpretations of the data that I had gathered by means of the case study.

- **To enable subsequent researchers to understand the field of study as a whole and the place of the present research in that field**

My reason for including such a wide selection of subjects in the literature survey was to understand the larger implications of the study in its setting. My own contribution has been both introductory and provisional, and there are many possible directions that future research into this topic may take (as has already been explained in section 5.4). One thing that anyone familiar with this field soon notices is that the topic of human-website interaction is one of great complexity, and that human emotions, psychological states and social responses play a far greater role in these interactions than any superficial examination might lead one to expect.

The justification for choosing particular participants and websites for this case study and the subsequent limitations inherent in such choices, were explained in some detail in Chapter 3. The research strategy in the case study was mostly exploratory and interpretive, and a self-administered questionnaire and semi-structured interviews were used to generate data that could be supported to a limited extent by means of triangulation. The questions in the questionnaire were mostly of the closed semantic differential scale type, with the exception of an open question at the end of each section of the questionnaire that was designed to allow the participants to supply whatever supplementary information and comments they wished to make. The questionnaire is contained in Appendix A. Chapter 3 described how the questionnaire was pre-tested and piloted before the actual research commenced.

The limitations of the study prevent any generalisation or extrapolation to similar situations because the results are interpretive and applicable only to the conditions that were applicable in this research. But within the confines of those limitations, definite trends were noticed and interpreted by means of the graphs presented in Chapter 4. The findings (with all their limitations) indicate that the field of research which studies the phenomenon of how particular websites project elements of the human personality

and temperament and how human beings respond automatically to these for better or for ill, is a promising field that has important commercial, individual and organisational implications.

5.3.1 Contribution

Possibly the most useful contribution made by this study is to excite interest in how (because of the habitual anthropomorphising tendencies of human perception) human beings react to the perceived personality that is projected by a website or interface as though it were another living human being. Once this process is clearly understood (and the present study makes a modest contribution to that knowledge), it will be possible to design interfaces and websites that almost totally match the temperaments and personalities of the target market of human users for which they are designed. Although it will never be possible to arrive at a complete match and correspondence between user and interface because of the vagaries and variations of human personality and responses, it should be possible to design websites and interfaces that are almost totally harmonious with the personalities and temperaments of their users. Although a great deal is already understood about how a website is able to project all the elements of a human personality (and thus be mistaken by the human mind for another living human being), a great deal of research is required in this field to make this body of knowledge more systematic and complete. The present study contributed to the accumulated knowledge of how websites project facsimiles of human temperament and thus deceive their users (on an unconscious level) into believing that they are actually human beings.

The other contribution that the study made was to emphasise the fact that if a website designer has a clear understanding of the target group of users and how they habitually think, feel and respond to various stimuli, it should be possible to predict how the average user will react to certain stimuli on a website that needs to be designed. This obviously has important applications, not only in business and

industry, but also in other important fields such as security, defence and education. This research has emphasised the importance for a website or interface designer of having a clear understanding of emotions, attitudes and prejudices of the target group in order to increase website "stickiness" and user satisfaction. Website and interface designers currently take far too much cognisance of the aesthetics of the design at the expense of the appropriateness of the design to the target user group. The present research contributes to raising awareness of how knowledge of the target group and the careful application of such knowledge are as important as the aesthetic principles that inform the design.

5.3.2 Answers to Research Questions

The objective of this research was to conduct a study to establish if typical human temperament characteristics can be ascribed to a website, in accordance with the emotional/logical and the extrovert/introvert dimensions, and, as a result of that, whether it is possible to ascribe a specific human temperament to websites.

A careful analysis and classification of the data gathered by means of the questionnaire and interviews make it clear that there is a trend that indicates that this might indeed be possible. Although it is not possible to present these conclusions on the basis of statistical or mathematical processes (because of the limitations of the study), it is possible to set out an interpretation of the relevant data against the background of theory presented in Chapter 2. What is evident from the results (although only in the form of the trends that were observed in a small sample and not in the form of statistically significant results), is that human beings do in fact attribute human characteristics to non-human objects such as websites. What observation of the participants of this study made clear was that, in some circumstances, people will not only assign elements of personality to website, but will actually react to a website as though it were a human being with a particular kind of personality in their attempt to arrive at some understanding the nature of a specific website.

What follows here are the research questions (in bold) and an explanation of the extent to which they were answered by the results of the research. Firstly, the main research question:

Do websites reflect a human temperament?

From the results that were described and depicted in graph form in section 4.3.3 of Chapter 4, it is apparent that it is indeed possible to identify a specific human temperament in particular websites. In addition to being able to identify individual website temperaments, it was also possible for the participants to identify thematic similarities in the groups of websites that were presented to them. The results made it clear that websites of similar functions and type tend to display similarities in the kind of metaphorical human temperament that they project. What follows here are the subsidiary research questions and answers to those questions.

- **Can it be shown that websites exhibit introvert/extrovert characteristics?**

The research results presented in Chapter 4 show that each website did indeed exhibit unique characteristics in terms of introversion and extraversion. Apart from their individual characteristics, websites in the same category tended to exhibit similar trends with regard to their degree of introversion and extraversion. The graphs that depict these results in graphic form are presented in sections 4.3.1 and 4.3.2 of Chapter 4.

- **Can it be shown that websites exhibit emotional/logical characteristics?**

The results presented in Chapter 4 show that, for all the websites that were tested, it was possible to identify unique characteristics that translated into either emotional or logical dimensions. As with the introvert/extrovert dichotomy, the results provided the

basis for grouping the websites in terms of their emotional and logical characteristics. As with the introvert/extrovert dimension, the graphs that support this conclusion are presented in sections 4.3.1 and 4.3.2 of Chapter 4.

5.4 Further Research

As stated in Chapter 3, in the discussion of the research approach and methodology, the study conducted was exploratory and the interpretation of the results was intended to be applicable to the current study and not to be generalised to a greater population. Some of the limiting factors of the study conducted were stated as the small sample size, the selective group of respondents and the subjective manner of website selection.

Because of these limitations, further studies would be needed to establish the validity of the questionnaire. A larger group of randomly selected participants should also be used in conjunction with a statistically selected group of websites to enable empirical research data to be collected. Another larger, statistically randomised study might result in statistically significant quantitative data that could be used for statistical evaluation to prove the interpretive conclusion of the current study.

In addition to the above suggestions, it was also suggested in Chapter 4 that a further study could be done where both the participants' and the websites' temperaments are determined and where the interaction between the different participant temperaments and the website temperament is studied.

5.5 Summary

In Chapter 1 the reader was introduced to the concept of human temperament as pioneered by C.G. Jung and its possible application to the Information Technology environment. This was followed by a problem statement which gave rise to the question of whether a specific human temperament can be assigned to a website. Chapter 2 elaborated on the concepts first introduced in Chapter 1 by offering a

background study and a literature survey. The purpose of this chapter was to guide the reader through those parts of the literature that were relevant to this research and to the answering of the research questions. It also served the purpose of preparing the reader to understand the rationale behind the case study that constituted the empirical research component of this study. Chapter 3 explained the way in which the problem was approached, the specifics of the methodology that informed the conduct of the case study, and the kind of data that was collected from the questionnaires in the individual interviews with participants. Chapter 4 provided details of the case study research and the findings and interpretations that were made on the basis of the data collected from the questionnaires and the interviews.

This chapter commenced with a summary of the research. This was followed by an evaluation of the research, the extent of its contribution to the accumulated knowledge in this field, and the possibilities for further research inherent in this topic. The research provided evidence that the participants were able to identify specific trends in the kind of temperaments that the websites projected. Although this study offers no hard statistical or empirical evidence to confirm that people do react to the perceived temperamental type of a website, it provides a great deal of preliminary evidence to suggest that it is very likely that they do. Any future study that is able to eliminate the limitations inherent in the methodology and findings of this study should be able to prove more strongly that websites do project human temperaments and that this is a fact of fundamental importance in the design of websites and interfaces. It was suggested in this study, on the basis of information obtained from the literature study, that the human mind displays a habitual anthropomorphising tendency as part of its unconscious but inbuilt strategy to make sense of the environment in which the human organism finds itself. This habitual anthropomorphising tendency is probably the basis of the human tendency to be able to identify the elements of human personality in websites and other inanimate objects, and it should be possible to devise further empirical research and methodologies that are able to provide strong evidence to support this assumption. Any conclusions that extend the modest claims made in this

study can only be proved by larger and statistically sound studies of randomly selected populations. One of the most interesting findings offered by this study were the participants' observations from the individual interviews that provide evidence that human beings do tend to react emotionally to websites as though they were living people of their own distinctive temperaments – however unlikely this hypothesis may seem to the casual and uninformed observer.

The objective of this research was to conduct a study to establish whether or not human temperament characteristics could be ascribed to websites. This was found to be possible within the limitations of the study because the participants in the study were able to identify the human temperaments of websites and allocate specific human temperament accordingly.

6. References

1. AGASSI, J. 1973. Anthropomorphism in science. *Dictionary of the History of Ideas: Studies of Selected Pivotal Ideas*, 1973: 87-91. [Online]. Available: http://www.tau.ac.il/~agass/joseph-papers/anthro.pdf [06 August 2007].

2. ALLPORT, G.W. 1937. *Personality: A psychological interpretation*. 1st ed. New York: Henry Holt and Company.

3. AMERICAN *Heritage Dictionary of the English Language*. 2007. 4th ed. Boston: Houghton Mifflin Company.

4. BOEREE, C.G. 1997. *Carl Jung*. [Online]. Available: http://webspace.ship.edu/cgboer/jung.html [22 March 2007].

5. BRINKMAN, W. & FINE, N. 2005. Towards Customised Emotional Design: An Explorative Study of User Personality and User Interface Skin Preferences. *Proceedings of the 2005 Annual Conference on European Association of Cognitive Ergonomics*, September 2005: 107-114.

6. BRITANNICA. 2006. *Concise Encyclopedia*. Chicago: Encyclopedia Britannica, Inc.

7. BYRNE, E. 2007. *IS research overview*. Class notes. 18 May 2007.

8. CAELLI, K, RAY, L. & MILL, J. 2003. 'Clear as mud': Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods*, 2(2): 1-24.

9. CARLINGER, S. 2006. About designing, trends, culture differences and myths: An interview with Aaron Marcus. *Information Design Journal*, 14(3): 199-206.

10. CASEBEER A.L. & VERHOEF, M.J. 1997. Combining qualitative and quantitative research methods: Considering the possibilities for enhancing the study of chronic diseases. *Chronic Diseases in Canada,* 18(3). [Online]. Available: http://www.phac-aspc.gc.ca/publicat/cdic-mcc/18-3/d_e.html [18 November 2007].

11. CHANG, J.E; SIMPSON, T.W; RANGASWAMY, A. & TEKCHANDANEY, J.R. 2002. *A good website can convey the wrong brand image! A preliminary report*. eBusiness Research Centre, Pennsylvania State University, University Park, PA.

12. CHANG COUPLAND, J; TEKCHANDANEY, J.R.; RANGASWAMY, A. & SIMPSON, T.W. 2003. *Websites as personalities and playgrounds: Their effects on brand image*. eBusiness Research Centre, Pennsylvania State University, University Park, PA.

13. CHEN, Q & RODGERS, S. 2006. Development of an instrument to measure website personality. *Journal of Interactive Advertising*, 7(1): 47-64.

14. CLELAND, K. 2007. *Talk to me: getting personal with interactive art*. [Online]. Available: http://research.it.uts.edu.au/creative/interaction/papers/interaction04_43.pdf [06 August 2007].

15. CHILDS, G. 1995. *Understand your temperament*. 3rd ed. Sussex: Rudolf Steiner Press.

16. COBER, R.T; BROWN, D.J; KEEPING, L.M. & LEVY, P.E. 2004. Recruitment on the net: How do organisational website characteristics influence applicant attraction? *Journal of Management*, 30(5): 623-646.

17. COCKTON, G. 2002. From doing to being: bringing emotion into interaction. *Interacting with Computers*, 14(2002): 89-92.

18. COMLEY, P. & LANG, J. 2007. *Website design is about understanding the user. How a model theory of user experience can help develop winning websites*. [Online]. Available: http://www.virtualsurveys.com/news/papers/paper_12.pdf [03 October 2007].

19. CRAWFORD, C. 2003. *The art of interactive design*. 1st ed. San Francisco: No Starch Press.

20. CROUCH, M. & McKENZIE, H. 2006. The logic of small samples in interview-based qualitative research. *Social Science Information*, 45(4): 483-499.

21. DE KERCKHOVE, D. 1991. Communication arts for a new spatial sensibility. *Leonardo*, 24(2): 131-135.

22. ENCYCLOPEDIA of Small Business. 2002. Farmington Hills: The Gale Group, Inc.

23. eSPINDLE Learning. 2006. 2nd ed.

24. FELDSTEIN, M. & NEAL, L. 2001. *Designing usable, self-paced e-learning courses: A practical guide*. [Online]. Available: http://elearnmag.org/subpage.cfm?section=tutorials&article=24-1 [08 March 2007].

25. FOGG, B.J. 1999. Persuasive technologies: Introduction. *Communications of the ACM*, 42(3) March 1999.

26. FORDHAM, F. 1953. *An Introduction to Jung's Psychology*. 3rd ed. New York: Penguin Books.

27. FOURNIER, S. 1998. Consumers and their brands: Developing relationship theory in consumer research. *Journal of Consumer Research*, 24(March): 343-373.

28. GABLE, G.G. 1994. Integrating case study and survey research methods: an example in information systems. *European Journal of Information Systems*, 3(2): 112-126.

29. GOMEZ-GAUCHIA, H, DIAZ-AGUDO, B & GONZALEZ-CALERO, P.A. 2006. *Automatic personalization of the human computer interaction using temperaments*. [Online]. Available: http://gaia.fdi.ucm.es/grupo/publications/2006-flairs-hgomez.pdf [12 March 2007].

30. GRAZIANO, W.G; JENSEN-CAMPBELL, L.A. & SULLIVAN-LOGAN, G.M. 1998. Temperament, activity, and expectations for later personality development. *Journal of Personality and Social Psychology*, 74(5): 1266-1277.

31. HALL, C.S. & NORDBY, V.J. 1973. *A primer of Jungian psychology*. UK: New American Library.

32. HANSON, W.E; CRESWELL, J. W; PLANO CLARK, V.L; PETSKA, K.S. & CRESWELL, J.D. 2005. Mixed methods research designs in Counselling Psychology. *Journal of Counselling Psychology*, 52(2): 224-235.

33. HEBA, G. 2007. *Particle Physics, Frank Lloyd Wright and Feng Shui: A walking tour through spatial web design*. [Online]. Available: http://www.stc.org/confproceed/2001/PDFs/STC48-000134.PDF [02 October 2007].

34. HEETER, C. 1992. Being there: The subjective experience of presence. *Presence: Teleoperators and Virtual Environments*, 1: 262-271.

35. HOEPFL, M.C. 1997. Choosing qualitative research: A primer for technology education researchers. *Journal of Technology Education*, Fall 1997, 9(1): 47-63.

36. HUDLICKA, E. 2003. To feel or not to feel: The role of affect in human-computer interaction. *International Journal of Human-Computer Studies*, 59(2003): 1-32.

37. HUNTER, A. 2006. *Web personality: creating and keeping one*. [Online]. Available: http://www.usq.edu.au/users/huntera/personality.htm [12 March 2007].

38. IMSDB, 2008. *Internet movies scripts database*. [Online]. Available: http://www.imsdb.com/scripts/Matrix,-The.html [12 May 2008].

39. JUNG, C.G. 1923. *Psychological types*. New York, NY: Harcourt Brace.

40. KARSVALL, A. 2002. Personality preferences in graphical interface design. *ACM International Conference Proceeding Series*; 31: 217 – 218.

41. KEIRSEY, D. 1998 *Please Understand Me II: Temperament, character, intelligence*. 2nd ed. Del Mar: Prometheus Nemesis Book Company.

42. KOSTOV, V, FUDUKA, S & YANAGISAWA, H. 2001A. Development of man-machine interfaces based on user preferences. *Proceedings of the 2001 IEEE International Conference on Control Applications*, 2001: 1124–1128.

43. KOSTOV, V, FUDUKA, S & YANAGISAWA, H. 2001B. Towards personalized adaptive user interfaces. *Design & Systems Conference*, 2001(10): 181-184.

44. KRAUT, R; KIESLER, S; BONEVA, N; CUMMINGS, J; HELGESON, V. & CRAWFORD, A. 2002. Internet paradox revisited. *Journal of Social Issues*, 58(1): 49-74.

45. KUMAR, N. & BENBASAT, I. 2001. Shopping as experience and website as a social actor: Web interface design and para-social presence. *Twenty-Second International Conference on Information*

Systems. [Online]. Available: http://dvda.cqu.edu.au/david-jones/Reading/ICIS_2001/01RIP07.pdf [02 October 2007].

46. LEINER, B.M; CERF, V.G; CLARK, D.D; KAHN, R.E; KLEINROCK, L; LYNCH, D.C; POSTEL, J; ROBERTS, L.G. & WOLFF, S. 2000. A Brief History of the Internet. {Online]. Available: http://www.isoc.org/internet/history/brief.html [24 January 2008].

47. LIN, C & McLEOD, D. 2000. Temperament-based information filtering: A human factors approach to information recommendations. *IEEE International Conference on Multimedia and Expo*, 2000(2): 941-944.

48. LUCENTE, M. 2000. Conversational interfaces for e-commerce applications. *Communications of the ACM*, 43(9): 59-61.

49. MARCHETTA, L. & REYNOLDS, M. 1998. Colour for technical documents. *Intercom*, 4: 14-20.

50. MARCUS, A. 2001. *Cultural dimensions and global web design: What? So what? Now what?* [Online]. Available: http://www.amanda.com/resources/hfweb2000/AMA_CultDim.pdf [26 February 2007].

51. MARCUS, A. & VAN DAM, A. 1991. User-interfaces developments for the nineties. *Computer*, 24(9): 49-57.

52. MARSH, S. & MEECH, J.F. 2007. *Agent-adaptive web sites: the introduction of socially adept agents to adaptive eCommerce web architectures*. [Online]. Available: http://scholar.google.co.za/scholar?q=%22socially+adept+agents%22+marsh&hl=en&lr=&btnG=Search [13 September 2007].

53. MAYKUT, P. & MOREHOUSE, R. 1994. B*eginning qualitative research: A philosophic and practical guide*. UK: Taylor & Francis Ltd.

54. MEECH, J. & MARSH, S. 2000. Social Factors in E-commerce Personalization. *Proceedings of CHI 2000 Workshop on e-Commerce*, April 2000. [Online]. Available: http://www.cs.unb.ca/~bspencer/NECAA/Papers/marsh.doc [02 October 2007].

55. MEYER, W.F, MOORE, C. & VILJOEN, H.G. 1990. *Persoonlikheidsteorieë. Van Freud tot Frankl*. 2nd ed. Isando: Lexicon Uitgewers.

56. McISAAC, M.S. & GUNAWARDENA, C.N. 1996. *Handbook of research for educational communications and technology: a project of the association for educational communications and technology*. New York: Simon & Schuster Macmillan: 403-437.

57. MOL, A. 2004. *Let's both win*. 1st ed. Cape Town: Struik Christian Books.

58. MOON, Y. & NASS, C. 1996. How "real" are computer personalities? Psychological responses to personality types in human-computer interaction. *Communication Research*, 23(6): 651-674.

59. NASS, C; MOON, Y; FOGG, B.J; REEVES, B & DREYER, C. 1995. Can computer personalities be human personalities? *Conference on Human Factors in Computing Systems,* May 1995: 228-229.

60. NASS, C. & MOON, Y. 2000. Machines and mindlessness: Social responses to computers. *Journal of Social Issues*, 56(1): 81-103.

61. NASS, C, STEUER, J. & TAUBER, E.R. 1994. Computers are social actors. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* April 1994: 72-78.

62. OLIVIER, M.S. 2004. *Information technology research. A practical guide for Computer Science and Informatics*. 2nd ed. Pretoria: Van Schaik Publishers.

63. OXFORD. 2001. *Oxford Paperback Dictionary Thesaurus & Wordpower Guide*, New York: Oxford University Press.

64. OXFORD Dictionary of Sport Science. 2007. 3rd ed. New York: Oxford University Press.

65. PALVIA, P; MAO, E; SALAM, A.F. & SOLIMAN, K.S. 2003. Management Information Systems Research: What's there is a methodology? Communications of the Association for Information Systems, 11(16): 1-33.

66. PEACH, C. 2007. *Interview with C. Peach* (Centurion), 10 June 2007.

67. PICARD, R.W. 1997. *Affective computing*. Cambridge: The MIT Press.

68. PINSONNEAULT, A. & KRAEMER, K.L. 1993. Survey research methodology in management information systems: An assessment. *Journal of Management Information Systems*, 10(2): 75-102.

69. PLUMMER, J.T. 1984. How personality makes a difference. *Journal of Marketing*, 57(1): 1-22.

70. PREECE, J, ROGERS, Y. & SHARP, H. 2002. Interaction design: Beyond human-computer interaction. 1st ed. New York: John Wiley & Sons.

71. ROGET'S II: The New Thesaurus. 1995. 3rd ed. Boston: Houghton Mifflin Company.

72. ROTHBART, M.K, EVANS, D.E. & AHADI, S.A. 2000. Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology*, 78(1): 122-135.

73. SHECHTMAN, N. & HOROWITZ, L.M. 2003. Media inequality in conversation: How people behave differently when interacting with computers and people. *Proceedings of the SIG CHI conference on Human factors in computing systems*, 5(1): 281-288.

74. STEVENS, A. 2003. *Jung: A very short introduction*. Audio book 1st ed. Oxford: Oxford University Press.

75. SUTCLIFFE, A. 2002. Assessing the Reliability of Heuristic Evaluation for Website Attractiveness and Usability. *Proceedings of the 35th Hawaii International Conference on System Sciences*, 7-10 January 2002: 1838-1847.

76. SWINTH, K.R. & BLASCOVICH, J. 2007. *Perceiving and responding to others: Human-human and human-computer social interaction in collaborative virtual environments*. [Online]. Available: http://www.temple.edu/ispr/prev_conferences/proceedings/2002/Final%20papers/Swinth%20&%20Blascovich.pdf [01 October 2007].

77. TAN TSU WEE, T. 2004. Extending human personality to brands: The stability factor. *Brand Management*, 11(4): 317-330.

78. TEGLASI, H. 1998a. Temperament constructs and measures. *School Psychology Review*, 27(4): 564-585.

79. TEGLASI, H. 1998b. Temperament and personality theory: The perspective of cognitive-experiential self-theory. *School Psychology Review*, 27(4): 534-550.

80. WALKER, J.H, SPROULL, L. & SUBRAMANI, R. 1994. Using a human face in an interface. *Conference on Human Factors in Computer Systems*, 24-28 April 1994: 85-91.

81. WEIBEL, P. 1990. *Virtual worlds: The emperor's new bodies.* [Online]. Available: http://www.aec.at/en/archiv_files/19902/E1990b_009.pdf [06 August 2007].

82. WORDWEB, 2005. *WordNet Database Thesaurus*. Princeton University.

83. ZHANG, P; VON DRAN, G.M.; SMALL, R.V & BARCELLOS, S. 1999. Web Sites that Satisfy Users: A Theoretic Framework for Web User Interface Design and Evaluation. *Proceedings of the 32nd Hawaii International Conference on System Science*, 5-8 January 1999.

84. ZHANG, P; SMALL, R.V; VON DRAN, G.M. & BARCELLOS, S. 2000. A Two Factor Theory for Website Design. *Proceedings of the 33rd Hawaii International Conference on System Science, 6-9 January 2002.*

7. Appendix A – Questionnaire for the Study of the Existence of Human Temperament in Websites.

This questionnaire has been prepared for a mini-dissertation required towards the completion of the **MAGISTER OF INFORMATION TECHNOLOGY**.

The questionnaire is to be used to gather information with regards to how websites are perceived by individuals and if this results in the portrayal of a temperament by the website.

I _____ hereby voluntarily grant my permission for participation in the study as explained to me by **Annatjie Theron.**

The nature, objective, possible safety and health implications have been explained to me and I understand them.

I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.

Signed: _____ Date: _____

Witness: _____ Date: _____

Researcher: _____ Date: _____

Upon signature of this form, you will be provided with a copy.

Thank you for your participation!

7.1 Questionnaire Guidelines:

a. The participant's responses are for research purposes only and his/her identity will be kept confidential.

b. If so required, the results of the questionnaire and study will be provided to participants on demand.

c. The participants are encouraged to discuss any issues related to the questionnaire with the author.

d. Please note that there are **20** (Twenty) questions per section and that both sections need to be completed for all **20** (Twenty) websites.

e. Please relate your answers to the emotional reaction you are experiencing during evaluation of the websites.

f. Please note that you will be required to have an interview with the author regarding your responses to the questionnaires within 1 (One) week of completion of the evaluations.

g. Please indicate your answers by **X**

7.2 Participant details:

Name:_____

Contact Details:_____

_____

_____

Please indicate the number of years you have been using the Internet:

< 1 Year		> 1 Yr but < 5 Yrs		> 5 Yrs but < 10 Yrs		> 10 Yrs	

Gender and Age

Female	
Male	

Age (in years)	20-29		30-39		40-49		50 +	

Do you currently or have you in the past worked in the IT industry?

Yes		No	

Please indicate as to what extend you find the following websites to adhere to the following statements:

7.3 Section 1

Logical/Emotional Dimension Questions

Website URL:			1	2	3	4	5	6	7	8	
1	Access to information is…	Highly structured									Unstructured
2	Interaction with site is…	Free-flowing									Controlled
3	The site appears to be…	Animated									Analytical
4	The site interaction is experienced as…	Strict									Playful
5	Site security (resistance to access) is…	Low									High
6	The main theme of the site is…	Entertainment									Functionality
7	The layout of the site is…	Helpful									Unavailing
8	The site design is…	Unconventional									Conventional
9	The site influences you…	Factually									Conceptually
10	The site makes you feel…	Attached									Indifferent
11	The site layout is…	Informal									Formal
12	The site conveys information…	Subjectively									Objectively
13	This site creates a feeling of…	Warmth									Frigidness
14	This site has a main focus towards…	Product									People

15	The site is…	Unforeseeable									Predictable
16	The site appears to be…	Sentimental									Unemotional
17	Navigation on this site relies on…	What you intuitively feel									What you perceive
18	Interaction with this site requires…	Reasoning									Aesthetic abilities
19	The design of the site is…	Innovative									Traditional
20	The appearance of this site is…	Intellectual									Passionate

A. Which one of the four websites above did you like best?_____

B. Why do you say so?_____

_____

_____

_____

_____

7.4 Section 2

Extrovert/Introvert Dimension Questions

Website URL:			1	2	3	4	5	6	7	8	
1	The colours used on site are mostly…	Bright									Subdued
2	The site appears…	Restricting									Inviting
3	The site interacts with the user in a way that is…	Authoritative									Submissive
4	The site is experienced as…	Stimulating									Dull
5	The site is being experienced as…	Amenable									Cranky
6	The sites organisation can be described as…	Disorganised									Practical
7	The site has a feeling of being…	Spontaneous									Reserved
8	The site appears to be…	Coaxing									Monitory
9	The site portrays an image of being…	Social									Unsociable
10	The styling of the site is…	Timid									Bold
11	The site has a general feel that can be described as…	Depressing									Cheerful
12	The site is in general experienced as…	Accessible									Inaccessible

13	The site is received as…	Intense									Indifferent
14	The tempo of the site is…	Active									Passive
15	The site evokes…	Apathy									Participation
16	The site appears…	Realistic									Delusive
17	The site is found to be…	Effective									Ineffective
18	The site is transcending as…	Inefficient									Efficient
19	In relation to other sites, this site is…	Interactive									Isolated
20	The site can be viewed as mostly…	Brassy									Soothing

A. Which one of the four websites above did you like best? _____

B. Why do you say so? _____

_____

_____

_____

_____