Title:

“Need for cognition” and IT user satisfaction

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Abstract

We are living in a technology filled world. Global investment in IT in 2017 was about US$3.7 trillion and it is estimated to increase into the future. This implies that there is an obligation to evaluate our IT systems more carefully and effectively to see if we are getting a good return on investment. There is a long tradition in IT evaluation mostly based on the Technology Acceptance Model and the DeLone and McLean IS Success Model. However, these models do not adequately consider individual differences in how users perceive, use and evaluate IS (or IT, we use these terms interchangeably in this report).

In other streams of research (for example in Industrial and Organisational Psychology), individual differences have emerged as worthy of serious investigation. For instance, there are many studies on individual differences in personality, motivation and ability (intelligence) and how they impact on outcomes such as job satisfaction, job performance, career success, academic achievement, subjective well-being and life satisfaction. Although most of the effect sizes are small (around r= 0.20), there are still important implications for understanding how successful outcomes are achieved.

In this study, we set out to ascertain the effect of Need For Cognition (a personality trait indicating the tendency of a person to enjoy and expend effort on thinking) on IT user satisfaction which is the proxy variable for IT effectiveness or success being studied here. The rationale is that IT users high in NFC would be more likely to have been more meticulous and careful when evaluating an IT system as compared to someone low in NFC. Also, the NFC construct has shown high reliability and validity and has already been tested for nearly 30 years.

We used the well established 18 item NFC Short Form Scale (Cacciopo et al, 1984) and developed a composite 18 item scale for IT user satisfaction. We tested the reliability of these scales with both having Cronbach Alphas of more than 0.8 which is considered high. We used a sample of Year 2 business and accounting students in Kent Business School (N=263) and invited participants to take part in the online survey (on the QUALTRICS platform) using both the scales above and a set of instructions for performing a short task using the school's website. A response rate of 26% was achieved and 68 students submitted responses which were valid.

Using statistical analyses (correlation and multiple regression), we found a small correlation (r=0.17) between NFC and IT user satisfaction. In the linear regression model, we also found that Confidence Belief and Gender were other major determinants of IT user satisfaction. Implications for IT evaluation practice are given as well as implications for work design and wider organisational practices. Limitations of the current research are listed and suggestions are given for future investigations.

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Contents

List of abbreviations

A.I.	Artificial Intelligence
ANOVA	Analysis of Variance
D&M	DeLone and McLean
DBV	Dynamic Capabilities View
ELM	Elaboration Likelihood Model
HCI	Human Computer Interaction
IOP	Industrial and Organisational Psychology
IS	Information System
IT	Information Technology
NFC	Need For Cognition
RBV	Resource Based View
SMAC	Social, Mobile, Analytics, and Cloud computing
SST	Social Shaping of Technology
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology

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Chapter 1 Introduction

1.1 New context of work, organisation and business

1.1.1 Turbulent environment

The world is experiencing change which is characterised as dynamic, complex and uncertain, which is equivalent to saying that, today, we live and work in a turbulent environment. For a business firm, all sectors of the environment – economic, regulatory, customers, competitors, technological, socio-cultural – are affected. This entails that organisations find ways of staying on top of these changes and keep themselves viable for survival or maintaining their lead over their competitors.

Even more distressing is that the pace of change is accelerating so that the need to sense the environment and respond to changes effectively is even greater. Added to this, the expectation that the firm be differentiated from its rivals means that creativity and innovation are necessary prerequisites for the current business situation on top of being efficient and effective in the ways of doing business. All this translates into the requirement for the firm to acknowledge the changes and to design and deliver new contexts, structures, processes and practices for business, work and organisation to adapt to the new environmental conditions.

The technology available for firms to use is expanding in both scope and scale and also innovations are continually being introduced at a greater pace than ever before. (**N.B. Please note that in this dissertation report, IT and IS are used interchangeably to represent a technology system)**. Not surprisingly, the IT expenditure by firms have skyrocketed. (Gartner, 2018) stated that IT expenditure 2017 was an incredible $3.7 trillion and predicted that this was going to increase even by 4.5% in 2018.

Since it started to be used in companies in the late 1950s, IT has become an integral part of work and organisational life. Most companies have at least some form of office productivity software e.g. Microsoft Office and in more recent times the wide availability of the Internet has seen the increase of communication and collaboration and tools. Enterprise systems are commonly used these days, for example, Enterprise Resource Planning , Customer Relationship Management and Supply Chain Management systems and all forms of social media (e.g. Twitter, Facebook, LinkedIn). Infrastructure services such as Cloud Computing and other Software as Service are increasing in popularity.

Selection of the right IT has always been a major difficulty for companies and this decision making process is not made easier with the growing proliferation of IT offerings on the market. As will be explained later, the selection of the IT product or service is not the only consideration. What’s more crucial is how

successfully this IT is integrated into the organisation and business to achieve the firm's objectives and goals.

In addition to selecting the right technology, implementing it successfully and getting the right use of it, the bigger challenge to compete successfully requires a digital innovation strategy (Nylén & Holmström, 2015) to achieve desired outcomes. This is both a technical as well as an organisational challenge and the latter may be a harder task than the former.
Technology has to be appropriate, yes, and it has to work as expected but it has to also to be adopted, appropriated, enacted, adapted and aligned with organisational objectives (explanations of these concepts are introduced in Chapter 2). This has more to do with the social systems, structures and processes around the technology than the material properties, features and functions of the technology.

Recognising the need to innovate implies knowing how to select the right innovation and knowing how to carry out the various stages of introducing and implementing it through to the realisation of anticipated outcomes. This is by no means a simple task. The essential activities are recognising the need to innovate and sensing and responding to information from the internal and external environment.

A key determinant of success is the level of organisational learning that is developed in the organisation and utilised for the above purpose and the leadership of change for putting proposed changes into action. Two other important attributes required are flexibility and agility for coping with changes of state in the environment and to be more effective in leveraging the resources of the organisation for achieving outcomes.

1.1.2 Management/organisational innovations

As suggested above, to complement technological innovation there ought to be corresponding business, work and organisation innovation to maximise the benefit of the change. Technical/technological innovation is not enough on its own as it is the impact on knowledge of business processes and execution of these processes that result in superior performance.
There is, therefore, the need to analyse business, work and organisation requirements both in design, implementation, adoption, use and evaluation of IT system and the important role of people within this. Ultimately, a socio-technical systems approach would be necessary to understand the full implications of technological innovation and change.

There are many examples of the latest technologies in the enterprise. Especially important are moves to adopt and capitalise on web technologies (web 2.0 and 3.0), Enterprise 3.0, A.I., the Internet of Things and the use of SMAC technologies – social, mobile, analytics, and cloud computing. These may appear to be discrete, isolated uses of technology at the moment but the full exploitation of these appear to be around the corner as applications are starting to be consolidated around industry contexts.

(Buer et al, 2018) describes the emergence of Industry 4.0 which is a smart manufacturing concept which uses Cyber Physical Systems (physical and Internet connected systems) and the Internet of Things. This started as a German government programme with the participation of academia, the private sector and the government but it is spreading to other parts of the word especially to countries like China. It also shows how technology can be married to digitalisation concepts and manufacturing philosophies like Lean Manufacturing for greater effect on outcomes.

The past two decades have seen the emergence of a number of concepts and managerial innovations, for example, new business models, management philosophies (e.g. Business Process Re-engineering, Total Quality Management, Customer Relationship Management in marketing, High Performance Teams in HRM and Service Dominant Logic in operations and service management) and innovation (open innovation (Chesbrough and Appleyard, 2007); disruptive innovation (Christensen, 2013)).

(Bharadwaj et al, 2013) discuss the main concerns for Digital Business (which is the use of the Internet for products, processes and services for conducting business) strategy. Two of the main components of this strategy are understanding how value is created and how value is captured. They also question whether IT strategy should be kept separate from (and subservient to) business strategy in such times where technology is of such key importance to the firm.

Apart from technology being considered in tandem with business when formulating strategy, the main purpose of introducing new technology in most firms is to do with improving performance and output. This can come about through automation, through facilitating input, processing or output, or through ensuring best practice in workflow systems by means of constraining activities to follow guidelines and requiring valid input and user participation. Technology can enable processes which could not happen without it. An example of this is real time collaboration and communication.

More technology may be good but there needs also to be a strategy for increasing technology acquisition and adoption. The organisation has to ensure employees use the technology more (in terms of frequency and amount of time) and make more effective use (which is appropriate and in keeping with the designed purpose of the technology, although innovative use can also be beneficial sometimes). There is also increased recognition that realising benefits from IT can be managed deliberately rather than left to emerge by chance.

1.1.3 Technology can enable and facilitate change adaptation

Technology can induce change by forcing through a work system change which then shapes how the work is conducted. An example would be an ERP system that requires rule following in the work system, thereby enforcing a particular version of “best practice” in the organisation. A more extreme version would be to re-engineer the business process through the use of

technology which then solidifies the practice after the change has been introduced. This would be more than just a technology change but a change in work practice. There are also consequences for employees as process redesign can often mean the loss of jobs.

Currently, the current fad is Digital Transformation (Digitalisation) is (Legner et al, 2017; Majchrzak, Markus & Wareham, 2016; Matt, Hess & Benlian, 2015). This is an all out rethink to digitalise business activities, processes and systems to embrace the use of digital technologies which also includes organisational change needed to make it work as a whole. The effort to go through with this is often due to external drivers and may be industry led (as in Industry 4.0 earlier). Participation is required of all parties in the initiative. The outcome is often uncertain as readiness for this kind and extent of change may not yet exist. From an employee and jobs perspective, the use of technology suggests the possibility of automation (e.g. robotics) that is likely to result in jobs being lost hence there may low acceptance of this change.
Even if the technological change is adopted, the implementation has to be carefully rolled out. As will be seen in Chapter 2, success is hard to achieve and this is contingent upon people and organisation issues as much as the nature of the technology introduced. Postadoption behaviour can be variable and the expected use may not materialise. There may also be unintended behaviour around the use of the IT system, even clear cut sabotage.

It is clear from the above that some kind of evaluation and conscious and deliberate benefits management is needed for ensuring that the outcomes are achieved but, even more importantly, there is organisational learning from the experience of the whole process of change.

The goal of adopting technological innovation and change is improved business performance. However, this requires both heavy organisational investment, organisation wide adaptation and IT-business alignment. For instance, technology infrastructure needs to be upgraded (Tilson, Lyytinen & Sørensen, 2010) in line with aspirations to participate in digitalised activities. These are not just cost issues but also issues of what specific knowledge is needed and how a different organisational attitude to the new environment may be developed.

The problem may thus be framed as the problem of what capabilities are needed for this transformation and where do these come from. However, this is no small problem as what is needed is not clear and will likely require sense-response and exploration-exploitation modes of behaviour. This is familiar territory to and is the main concern of business strategic thinkers.

1.2 Capabilities (dynamic) and competitive advantage

1.2.1 Strategy - Resource Based View (RBV)

Firms have always looked for ways in which they can be better than their competitors in the markets that they are in. The most common method that they have used to analyse this is SWOT (strengths, weaknesses,

opportunities, and threats) analysis with respect to internal strengths and weaknesses and external opportunities and threats. Even though, it is necessary to analyse the external environment as a first step, the internal analysis is likely to be more useful for knowing what resources to acquire and which capabilities to develop for the purpose of achieving a competitive advantage (Barney, 1995).

The resources and capabilities approach to strategic management is termed the Resource Based View (Wernerfelt, 1984; Barney, 1991; Wade and Hulland, 2004). A variant of this approach emphasised the important role of knowledge and skills (Grant,1996). The essential idea is that if the firm can acquire valuable and rare resources to produce their products and services and carry out processes, the firm can create a sustainable competitive advantage if the resources are also inimitable and non-substitutable. Capabilities and skills are developed by the firm in the course of carrying out its routines using the resources afore mentioned.

The approach allows a firm to analyse its resources and capabilities to understand which of these are distinctive and valuable and thus to focus on these ones to secure a competitive advantage over its rivals. The development and use of these capabilities will ensure a sustainable edge over their competitors if resources are assumed to be advantageous and immobile (i.e. unlikely to move easily to other firms). A good example of this is the “sticky” tacit knowledge of the firm’s employees and the organisation’s routines which differentiates them from other firms in the industry.

While the RBV is useful for highlighting the internal qualities of the firm and despite its popularity in the strategic management field, critics have pointed out some glaring defects in the approach. Just to pick out one of these, among a number of criticisms (Priem and Butler, 2001) pointed out that RBV is essentially a static theory which speaks of resources but does not explain how they came to be developed or why, which leads us neatly to the next theory.

1.2.2 Dynamic Capabilities View

As the name suggests, the Dynamic Capabilities View propounds on the firm’s adaptability to the changing environment (and also the ability to change its environment) over time. Although the view has been mostly associated with David Teece (Teece, Pisano and Shuen, 1997; Teece, 2007) and is seen as an extension to RBV, it has been developing over twenty years or so in the management and economics literature and is built on many theories before it. The main idea is that unlike the RBV which deals in static capabilities derived from resources, here, firms develop, over time, capabilities which serve to help the firm steer its way through a changing environment. In other words, dynamic capabilities are above operational capabilities and determine which capabilities are necessary for the firm to develop and use.

(Teece, 2007, p1319) states that sustainable competitive advantage “requires unique and difficult-to-replicate dynamic capabilities. These capabilities can be harnessed to continuously create, extend, upgrade, protect, and keep

relevant the enterprise's unique asset base… dynamic capabilities can be disaggregated into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets."

The relevance of the DCV is that is that in dynamic turbulent environments, dynamic capabilities are what would be required to stay competitive. There is a learning component here, where the organisation develops the right capabilities for long term survival and success. There have been criticisms of DCV for not spawning empirical studies based on it but (Wang and Ahmed, 2007) have provided some examples of it being used for analysing the US metal-working sector after World War 2. (Lo and Leidner, 2018) recently reported on her study of two dynamic capabilities - Absorptive capacity and Strategic agility which might be the mechanistic link between IS strategy and IS performance.

1.2.3 Microfoundations of dynamic capabilities

While the DCV is usually applied at the level of the organisation, in recent times there has been increasing calls for analyses at lower levels, for example, at the level of the individual. It is by no means suggested that we should abandon organisational analyses – we still have to pay attention to aggregate level phenomena. It's just to respond to critics that DCV is not able to explain how the organisational capabilities come about. By introducing the notion of microfoundation, this becomes more possible. The analogy that is applicable here is the micro-macro distinction in economics. It is sensible and desirable (though not easy) to be able to bridge the two levels of analysis. This is often by means of reduction. "By reduction is here understood the process of explaining a particular phenomenon in terms of more fundamental phenomena" (Foss, 2011; p1415). Other examples are (Sambamurthy et al, 2003) with digital options and (Yeow, et al, 2018) on aligning with digital strategy.

1.3 IT capabilities

1.3.1 Types of IT capabilities

IT is said to confer competitive advantage, although IT assets by themselves, are unlikely to be sources of advantage as these IT assets can be easily acquired by other firms. This is where IT capabilities come into the picture.

(Bhatt and Grover, 2005) identify value, competitive, and dynamic capabilities as three distinct types of capabilities in this regard.
An example of value capability is the investment in IT infrastructure
A competitive capability would be IT management which includes two capabilities:

1) IT business experience -

The extent that IT groups understand the business and is able to integrate business and IT strategy

2) the relationship infrastructure
the extent to which there are positive relationships between IT and business managers

A dynamic capability is the organizational learning (absorptive capacity), which involves accumulation, sharing, and application of knowledge.

(Bharadwaj et al,1999) similarly categorised IT capabilities as:
IT business partnerships,
external IT linkages,
business IT strategic thinking,
IT business process integration,
IT management, and
IT infrastructure

1.3.2 Competitive advantage, Performance, Exploration-Exploitation

(Aral and Weill, 2007) explain variation in performance as due to differences in firms' IT investment allocations and their IT capabilities.

(Benitez et al 2018) pointed out the role of information technology in opportunity exploration and exploitation of the firm's capabilities – namely, the effective use of IT infrastructure and the IT-enabled business flexibility.

(Pavlou and El Sawy, 2006) studied IT leveraging success in the case of new product development.

(Leonardi, 2007) showed how the information that is created, modified, transmitted, and stored through using IT leads to organizational change .

(Mata et al, 1995), using the RBV, explained the importance of managerial skills in achieving competitive advantage.

(Powell and Dent-Micallef,1997) emphasised the importance of human, business, and technology resources in competitive advantage.

(Ravichandran, 2018) looks at the relationships between IT competence, innovation capacity and organizational agility

(Santhanam and Hartono, 2003) tested and found that firms with better IT capability had better sustained firm performance when compared to average industry performance.

1.4 Individual differences

In this section, we look at whether there is evidence that individual differences in mental (cognitive) ability/intelligence, motivation and personality matter to job performance or to job satisfaction. We will revisit individual differences in Chapter 2 when we consider motivated cognition.

1.4.1 Ability

Salgado et al (2003) in a large scale meta-analysis of tests of General Mental Ability and specific cognitive ability (i.e., verbal, numerical, spatial, and memory) across the EU, found that performance in these tests were very good predictors of job performance and training success. These tests were mainly used for job selection purposes.

Campbell and Wiernik (2015) explain that individual work role performance is the definitely the most important variable to be measured in Organizational Psychology and Organizational Behaviour and they go into detail about many aspects of measurement and organisational practice in the US which is helpful for first time researcher.

1.4.2 Motivation

Van Iddekinge et al (2018) found that ability was more important to training performance and to performance on work-related tasks in laboratory studies than motivation. However, ability and motivation were more or less equally important to job performance.

1.4.3 Personality

Lado and Alonso (2017) investigated the dependent variables: overall job performance (OJP), task performance (TP), and contextual performance (CP) for a job with low level of complexity (defined here as the degree of information processing required by the tasks). They found that, of the Big Five personality dimensions, conscientiousness and emotional stability were predictors of the three measures. Extroversion predicted OJP and TP. agreeableness predicted CP.

1.5 Rationale, purpose, aims, goals and objectives of dissertation

Before going into details in the coming chapters, it is beneficial to start by laying out the reasons and motivation for this research. Apart from intellectual curiosity about the topic, this research should also be relevant and important to managers and decision-makers everywhere, Despite the context of the research, it is not ultimately confined to those involved with the use of IT but is applicable to any work which requires cognitive effort.

1.5.1 Rationale and purpose

The main rationale for the research is that, as explained above, IT has now become very pervasive at work, in organisations and an integral part of society. To realise value from IT users must first use IT frequently and for longer but at the same appropriately and effectively as a means of justifying a huge capital outlay. We are aware of the impact of individual differences when it comes to job performance. This effect should also be explored in the use of IT. Whilst there have been some work in this area and this is increasing in the last few years, the amount carried out in the direct area of IT evaluation is small.

The standard IT evaluation models assume that all users process information in the same rational way but, as will be seen later, those high in NFC do not process information in the same manner as those in NFC or do not always do it in the same mode. Clearly, this has consequences for the conclusions when it comes to using and evaluating an IT system.

The purpose of the research is, therefore, to address this research gap by making a starting contribution with a simple website evaluation study in a university environment which is easier to control and manage than a project undertaken in an unfamiliar context and environment. The mode of research (online web survey using QUALTRICS) was chosen for its convenience for running the survey as well as to manage the data obtained from it on a longer term basis.

1.5.2 Aims, goals and objectives – research questions

The aims of the research are to discover the extent that the construct Need For Cognition can explain the variance in User Satisfaction in a website evaluation task. Two scales are used. One is the 18 item Scale developed by (Cacioppo et al, 1984). This has been used for a number of years and its validity and reliability have been well proven. On the other side, the scale used for IT user satisfaction is based on a number of instruments already well established IT evaluation research field.

Need For Cognition is becoming a more popular research topic but there have not been as many investigations in IT evaluation as there have been in political communication, advertising and marketing and media use. However, things are picking up and recent investigations have explored related areas such as intellectual curiosity, motivated cognition and even mindfulness. The topic of Need For Cognition is potentially useful also for education where the issue of getting and keeping engagement is highly important.

The goal of the research is to initiate a stream of research on individual differences and how these may affect the practice of IT evaluation. The objectives are to understand the nature of the construct Need For Cognition and be able to apply this understanding sufficiently to be able to take proper action also in number of different fields of endeavour beyond IT evaluation (e.g. in education).

The main research questions are:

Q1: Is there association between NFC score and IT user satisfaction score and what is its sign?

Q2:What is the size of this association?

Q3:How does this association compare with other well known independent variables like Gender, Self Concept and Self-efficacy?

(N.B. More detailed research questions are posed at the end of Chapter 2, after a review of the relevant literature)

This is an exploratory study (albeit with some confirmatory checks) and is meant to be the start of the journey of investigation. It should be borne in mind that both humans and organisational life are highly complex and a simple reductionist research technique which uses an unwieldy, blunt instrument, is unlikely to provide adequate answers. An approach like this, however, can provide some hints for how to proceed in a future project, nevertheless.

1.5.3 Structure of the dissertation

Bearing in mind the aims and objectives described above, it will be helpful to provide an explanation of how the dissertation report will unfold. The genre conventions of such a report dictate that the structure of the dissertation will be as follows:

Chapter 1 introduces the context and topic of the research. The current business environment is described as dynamic, turbulent and complex. Technology is seen as an enabler of change and of being able to assist in matters such as productivity and efficiency if it is used correctly or imaginatively. Some currently popular management concepts and theories have been used to understand and explain business and organisational conditions and what we could do about them. The idea of dynamic capabilities is helpful in understanding chaotic business conditions and how firms can sustain a competitive advantage here. Microfoundations provide clues as to how these dynamic capabilities might work (i.e. mechanisms), two of which may be absorptive capacity (the abililty of the organisation to learn continually) and agility (adaptability to changing environment). The importance of individual difference is highlighted with examples of how the key differences (ability, motivation and personality) affect job performance at the individual level.

Chapter 2 reviews the relevant theories on technology and organisation before explaining in more detail some models of IT evaluation that have been tried before.The importance of knowing the social side to IT is that the use of IT is always in a social context so that whether in design or in implementation and usage, this should be understood clearly and thorough for effective change to happen. The IT evaluation process is shown to be fraught with problems as values, assumptions and beliefs and interests get in the way of “objective” judgement. A socio-technical approach seems the most effective in getting IT

adoption right and encouraging employees to use the IT system and obtain the desired results (importantly in the post-adoption phase).

Chapter 3 describes the methodology used for the research. The survey method is used for this study as it is tried and tested and yields data which can be easy analysed. It is suitable as a starting point for later work which may require thicker, richer qualitative data from more in-depth participative research techniques. The ease of access in terms of conducting the research was the key consideration for choosing this method of research. Obviously, this has implications for how generalizable the findings are but as a first step this research design may be justified.

Chapter 4 presents the results of the research investigation. The data is fed into IBM SPSS25 and the appropriate statistical checks were made. Statistical techniques are used to detect patterns in the data. Issues of outliers, non-response and response bias were dealt with and the standard reliability and validity checks were carried out. Results and analyses were compared to those obtained elsewhere, not only in the field of IT evaluation but also in many other diverse fields. Issues of interpretation were carefully handled and recourse was made to other researchers and authors who were experts in this area for their opinions and recommendations.

Chapter 5 discusses the analyses and interpretations of the results. It considers also various limitations of the research to do with theory, methodology and practicality and suggests how these may be overcome or reduced in importance. Furthermore, a future research agenda is provided to cover the gaps in the research. Looking at the current research activity in this area, there appears to be a number of research streams which are related to NFC. For example there is one using the Needs Affordances and Features framework which could potential include NFC and also System 1 and System 2 cognition which is similar to Central vs Peripheral processing that NFC pioneers use.

Chapter 6 concludes with a summary of the main findings and looks at the practical implications for organisations. Knowing organisational issues in depth will help to understand better the right course of action and to much more appropriately use knowledge to carry out changes for sustainable and competitive organisations. The people factor is as important as the technology (the use of the sociomateriality concept is appropriate here) in enacting change. The work system has to be considered as where the change has to be embedded in its proper context.

In this chapter, we have introduced the problem context and the motivation for the research. We have explained the rationale and purpose of the investigation, the main research questions and the sequence of chapters and the overall structure of this report. The next chapter goes into the details of the intellectual history and context for this investigation.

Chapter 2 Literature review

This chapter looks at the context of the research investigation in a broad sense and traces the intellectual history of IT evaluation. It starts with social and organisation theory and then narrows down to focus on specific areas of knowledge regarding evaluation, cognition and motivation.

2.1 Technology and organisation

2.1.1 Sociotechnical systems thinking vs technological determinism

Scientific Management (or Taylorism, as it was the name it was known by its critics) was in its heyday in the 20th Century. With this factory philosophy, technology was a means to an end. Although it was used heavily, there was not much thought given to the influence of technology over the work system and the power over employees derived from this. Technology was merely instrumental in getting the work done. Technology was regarded as neutral in this sense.

The Hawthorne Experiments in the 1930s at Western Electric in Ohio, USA showed the importance of the social dimension – employees appreciated the attention given to them by their employers and productivity seemed to rise as a result of this. Even so, there was not yet a clear understanding of the social being as important the technical in the context of work systems.

Beginning in the 1950s, the postwar reconstruction of Britain saw the rapid rise of power generation and the need for increased supplies of coal. In a famous study on the longwall coal getting technique, it was found by (Trist and Bamforth,1951; Emery and Trist,1965) at the Tavistock Institute in London study work systems that the new technique/technology had social consequences and employees were consequently not happy with the change. This was a landmark moment and the ideas and discoveries have carried on from that time especially in research and studies of Applied Ergonomics (Mumford, 2006, Eason, 2001). Even more importantly, the fusion of the social and technical proved to be an important approach to effective design (Baxter and Sommerville, 2011; Dallat et al, 2018; Doherty and King, 2005; Doherty et al, 2006) and the understanding of technological and organisational change (McLeod and Doolin, 2012; Whyte, 2010) and systems thinking (Waterson et al, 2015).

2.1.2 Social Shaping of Technology (SST)

As mentioned earlier, in the earlier part of the 20th Century technology was considered to be the driver of societal change (this was called “technological determinism” or the “technology imperative”). There was no organisational choice involved when technology is introduced and when implemented, the consequences were inevitable. However, in the late 1960s and early 1970s this idea came under fire from acolytes of the social construction of reality theory (Berger and Luckmann, 1967). This theory where reality was a product of the mind of the social scientist became quite influential in starting a whole

new school of social constructivists who applied this thinking also to technology in society (Social Construction of Technology) (Bijker et al,1987; Winner, 1993; MacKenzie and Wajcman, 1999) and to scientific knowledge(Sociology of Scientific Knowledge).

The movement above shows the limits of technological determinism and is useful for understanding social-IT interactions. It shows the importance of social context and the influence of social forces. It also shows the unpredictability of development paths and outcomes when introducing a new technology (e.g. the development of the bicycle or the typewriter keyboard) due to the dynamics of interaction of people and technology. It leads to better understanding that social acceptance and social control of technology in society and organisation are sociological in nature and not just driven by the materiality of the technology (Doherty et al, 2003).

2.1.3 Structuration Theory

Sociologists have long wondered whether structure determines social action or the other way round. Giddens' solution (Giddens, 1984; Jones and Karsten, 2008) suggests that each determines the other. Action creates structure and then this structure further constrains action in cycle. This is very similar to institutionalism where historically actions create institutions these institutions constrain future actions (Orlikowski, 1996; Barley and Tolbert, 1997; Zammuto et al, 2007). The reason why it is important to understand structuration is that social action is necessary to create change and the change creates structure that will promote or inhibit future change actions. With technological change, once the IT system is adopted, it needs to be accepted and structural changes will have to be aligned with how the management see the technology to take hold in the organisation. Ultimately, work changes result, from adaptive work practices with the technology, in an improvement in business performance.
DeSanctis and Poole (1994), using Adaptive Structuration Theory, describe how better understanding of appropriation and alignment of technology in organisations. A newer version of this theory (Adaptive Structuration Theory for Individuals) (Schmitz et al, 2016) is analyses the use of malleable technology (e.g. smartphones) in the workplace.

2.1.4 Sociomateriality

Sociomateriality goes beyond structuration theory and explains that the social and material aspects of IT are constitutively entangled so that one cannot be analysed without consideration of the other at the same time. Materiality means what persists through time. It is often the physical but can also be any kind of artefact such as an idea. The main claim that sociomateriality makes is that technology is enacted in organisation practice and is not just social or material components. Both the social and material are important. For example, the shaping of technology by groups should be studied without forgetting that technology has materiality and technology artifacts should be studied as equally important.

(Leonardi, 2013; Leonardi and Barley, 2010; Orlikowski, 2007; Orlikowski, W. J. 2010; Orlikowski, and Iacono, 2001; Orlikowski and Scott, 2008)

2.1.5 Features and Affordances theory

The concept of affordance was introduced by (Gibson,1977; 1979) to bridge the objectivity-subjectivity divide in psychology in an approach known as Ecological Psychology. As such, Gibson regarded affordances as "actionable properties between the world and an actor (a person or animal)…and are relationships" This is an interesting concept that does away with the separation between the world and the actor and sees them in an interactive relationship. It became modified and adapted later for use in the Human Computer Interaction (HCI) field by (Norman, 1999) whose main concern was with design principles and with understanding usefulness and usability.

Transferring this to organisation studies, (Majchrzak and Markus, 2012) explain that the concept of technology affordance "refers to an action potential, that is, to what an individual or organization with a particular purpose can do with a technology or information system; technology constraint refers to ways in which an individual or organization can be held back from accomplishing a particular goal when using a technology or system."

Sociomaterial studies have to include the study of affordances and constraints to have a better grasp of what IT features translate into in the use of an IT system. The user has needs and the IT system provides affordances and constrains through the availability of IT features.

2.2 Technology and the problem of evaluation

2.2.1 Why evaluate?

Evaluation in any field of investigation is complex and problematic (Jones and Hughes, 2001). The reason is obvious as judgements of success depend commonly held beliefs, interests, values and assumptions to base the judgements on. This is on top of the different conceptions of what success is in the first place and what measures can be devised to measure the extent or degree of success.

Although, performance, usage and user satisfaction are three common foci of evaluations, the notion of success of an IS is invariably contested (Cecez-Kecmanovic et al, 2014). It depends on whose interests and values dominate the discussion and whose goals are prioritised. (Irani, 2002). Despite all this, it is necessary to go through this exercise as the ability to conduct an effective IT evaluation can be considered a kind of dynamic IT capability which can confer a sustainable competitive advantage to the firm concerned. Developing this capability would help the firm to select the right technologies and also learn how to implement and use these well to get the benefits sought (Farbey et al, 1999; Serafeimidis and Smithson, 2000; Palvia et al, 2001; Seddon et al 2002;Klecun and Cornford, 2005)

Also, from a pragmatic perspective, IS evaluation can give credit for success achieved, boost morale and constitutes valuable feedback for learning and improvement. However, there are also commonly failures as well as successes (Yeo, 2002)

2.2.2 When to evaluate

Evaluation can be undertaken ex ante or ex post (Kumar, 1990; Gwillim et al, 2005) or on a continuous basis (Remenyi and Sherwood-Smith,1999).
Ex ante evaluation can be at the design stage to form ideas or to get opinions to guide the design. It can also be at any of the following stages (i.e. development and implementation) as well to get some feedback on how well the ideas would be received.

Evaluation can also be on a continuous basis such that there are no distinct start and end points.

Benefits management is about deliberately trying to realise benefits from the IS investment and is more a management approach than technology project (Coombs, 2015; Doherty, 2014; Doherty et al, 2011; Breese et al, 2015)
Failures and successes should be investigated for organisational learning purposes (Dwivedi et al, 2015)

2.2.3 Contested and conflictual; existence of resistance and inertia

IS evaluation is contested and conflictual due to value clashes, socio-political and ideological differences and domination (Symons,1991; Knights,1995; Smithson and Hirschheim,1998; Serafeimidis, and Smithson, 2003). Divergent goals are often being pursued with different visions, expectations and motivations.

Two common problems encountered are:

1) Inertia where users are happy with existing arrangements, in their comfort zone and would prefer not to change or else they would like to protect their positions.
2) Resistance where the users may feel that has been a breach of psychological contract and feel let down and therefore resist any change (Doolin, 2004; Rivard and Lapointe, 2012; Laumer and Eckhardt, 2012)

Evaluation needs social capital for it to be successful (Newell et al, 2004).

2.2.4 Difficulties with IS evaluation

Over many different studies it has been found that IS evaluation can be difficult if:

The input - outcome effect is distal rather than proximal and indirect rather than direct or the effect might involve intervening variables.
Measurement systems (e.g. accounting rules) may also cause problems.

Inappropriate measures may have been used.

The recognition method and timing of recognition may also be problematic.

There may be a time lag for the outcome or effect to occur.

The duration of the effect occurrence may be long and difficult to assess.

External conditions may have changed and internal conditions may have changed.

In addition there may be:

heterogeneity of interests values assumptions expectations

incommensurable measures

divergent expectations

vested interests in the outcome of the evaluation

2.2.5 Needs sensitive approach

It has been found across many studies that a sensitive approach is needed due to possible adverse/harsh implications or blame assigned to particular individuals or groups.

Some other possible problems include the following:

IS evaluation tends to be avoided due to potential embarrassment.
Some may argue that if the investment is already committed (sunken costs) there is no need for an evaluation.
Dishonesty or withdrawal cannot be ruled out when participants give views or opinions or withhold them.
Participants may tailor their behaviour to the evaluation tool straitjacket.
The form of the evaluation may be restrictive.
Some questions were not asked.
There are consequences for some users/developers/managers for failure or even success.
There may be loss of face, reputation or power for some staff.
There may be dismissal of staff.
There may be a withdrawal of resources, staff, assets as a result of success (e.g. staff reduction because of doing well).
There may be disruption to operations due to the conduct of the evaluation.
The cost may be too high.
The time needed for evaluation may not appear to be justified.
Other resources may be needed.

2.3 Models of IT evaluation

Since the mid to late 1990s, the search for the value of IT has focussed on first on productivity and economic value and then broadening out the search to include other measures of value to the organisation.

2.3.1 IT Business Value

Much of IT evaluation has been aimed at finding the return on investment in IT or the impact of IT on business performance in economic terms (Barua et al, 1995; Melville et al, 2004; Kohli and Grover, 2008; Schryen, 2013) and mostly involves ex post evaluation. The consensus is that IT does create value but the proviso is that it should be complemented with management and organisational upgrades (Mithas et al, 2011; Quaadgras et al, 2014) as well to make the improvement in performance happen.

Business value also can manifest itself in many ways, not just in profitability. There could be improvement in, for example, in processes such as Supply Chain Management. IT value can also be measured at different levels, from individual to group to organisation or even inter-organisational. Numerous factors mediate the IT investment and the value achieved from IT, such factors as usage, process change, process performance improvement and more information sharing. The actual causality is difficult to prove definitively. It may be argued that with the increasing amount of digitalisation in today's business and organisational activities, the value of IT becomes correspondingly greater as IT is embedded in work and business practices more and more and is an essential foundation for the conduct of business.

2.3.2 Strategic IT

Business - IT Alignment or alignment between IT and Business means the linking IT planning and business planning [Some writers distinguish between the terms IS, IT and Information Management but in this dissertation we consider these to be synonymous for purposes]. In other words, this means considering both IT and business decisions at the same time and with equal weighting for most part. For the most part this alignment works well (Sabherwal and Chan, 2001) and results in an advantageous position for the firm. However, as was pointed out earlier in the section on dynamic capabilities, what is strategic about IT is not the possession of IT assets themselves but how these assets are appropriated and converted into resources and capabilities within the firm in unique ways. This explains the findings that the business value of IT is derived from the complementarity of IT capabilities and organisational capabilities and results from Strategic Agility and Absorptive Capacity as microfoundations, more than just the IT assets/resources alone.
IT resources include "physical IT infrastructure components, technical and managerial IT skills, and knowledge assets" (Coltman et al, 2015; p91). Linking business and IT requires a shared understanding of the strategic nature of IT which is not often found in many organisations. IT governance mechanisms (on infrastructure, processes, architecture) must also work effectively for IT to be strategic.

2.3.3 User satisfaction as proxy for success

The “IT User Satisfaction” construct in IT evaluation is often used as a proxy for “success”. This seems to be a simple and straight forward way of measuring success. However, the main drawback is that the chain of events “satisfaction - attitude – intention – behaviour (use) - success” is not always realised so the successful behaviour is not guaranteed even if the satisfaction score is high. However, Wixom and Todd (2005) show how this chain could be possible by using beliefs about system features such as reliability instead of satisfaction with reliability which could then translate into attitudes which then form intention to use and finally to behaviour. So user satisfaction could be regarded as an attitude about certain system objects e.g. reliability which then solve the problem mentioned earlier.

Despite the problems outlined above, the user satisfaction is even more important today as we are more and more concerned with the experience and perception of the user (subjective impressions with emotional qualities concerned with the system ability to meet needs and wants of the user) and with issues of usability, aesthetics and accessibility on top of evaluating a system’s “objective” performance. Bailey and Pearson (1983) provided an early sample of 39 factors that could affect satisfaction and proceeded to devise a scale for measuring user satisfaction which Ives et al (1983) and Doll and Torkzadeh (1988) further refined. The list of variables - content, accuracy, format, ease of use and timeliness - has been used in countless scales since then. Also, the instrument developed by Doll and Torkzadeh had adequate reliability and validity and was short, easy to use, and can be employed for both research and practical investigations

2.3.4 Popular models used

Technology Acceptance Model

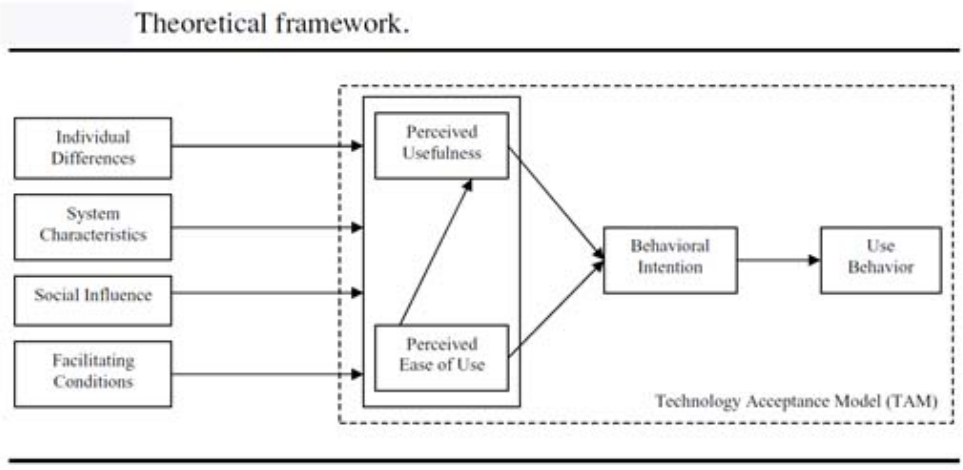

Fig 2.1 Technology Acceptance Model (Venkatesh and Bala, 2008; p276)

IT implementations do not a high success rate. Only about 25% are successful according to traditional criteria like being delivered on time and within budget (Legris et al, 2003). This has led to the popularisation of models of evaluation that may help with understanding reasons for this low performance rate whilst

being itself easy to use. The most used model for evaluating IT systems that has emerged so far is the Technology Acceptance Model (TAM) which was introduced by Fred Davis in his PhD thesis in1986 and published as an article in (Davis, 1989) and also in later publications (Davis et al,1989; Davis et al, 1992).

The central ideas of the theory are based on the Theory of Reasoned Action (Ajzen and Fishbein,1977) and the Theory of Planned Behaviour (Ajzen,1991). The theory (see figure) states that external factors influence the user's perceived ease of use which then influences user's perceived usefulness which then leads to beliefs and attitudes which translate into behavioural intention and then the use behaviour itself. In addition to being popular, it appears to be moderately effective with (Legris et al, 2003) claiming that 40% of the system's use is explained by this model. Later versions of TAM have added more variables to the basic model (Burton-Jones and Hubona, 2006).

Further, (Venkatesh et al, 2003) introduced a Unified Theory of Acceptance and Use of Technology (UTAUT) (see figure 2.2) by incorporating 8 different evaluation models: "the theory of reasoned action, the technology acceptance model, the motivational model, the theory of planned behavior, a model combining the technology acceptance model and the theory of planned behavior, the model of PC utilization, the innovation diffusion theory, and the social cognitive theory". ..which outperforms the eight individual models with an adjusted R^2 of 69 percent (Venkatesh et al, 2003, p425).

UTAUT

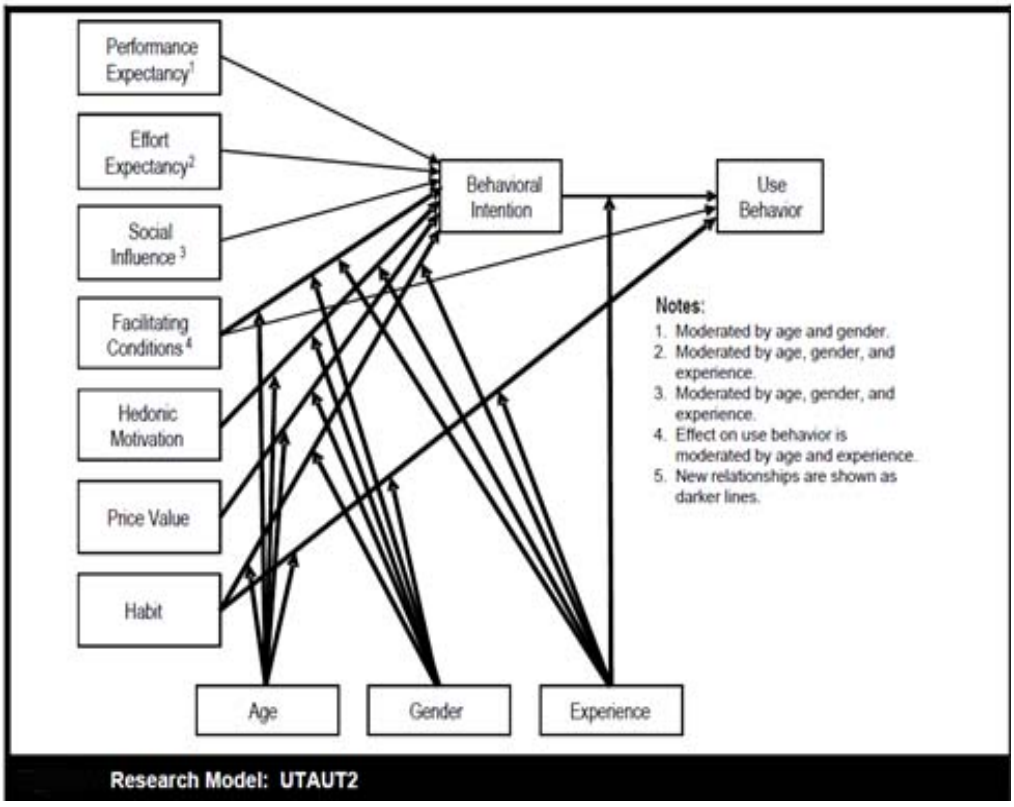

Fig 2.2 UTAUT2 (Venkatesh et al, 2003; p160)

DeLone and McLean (D&M) IS Success Model

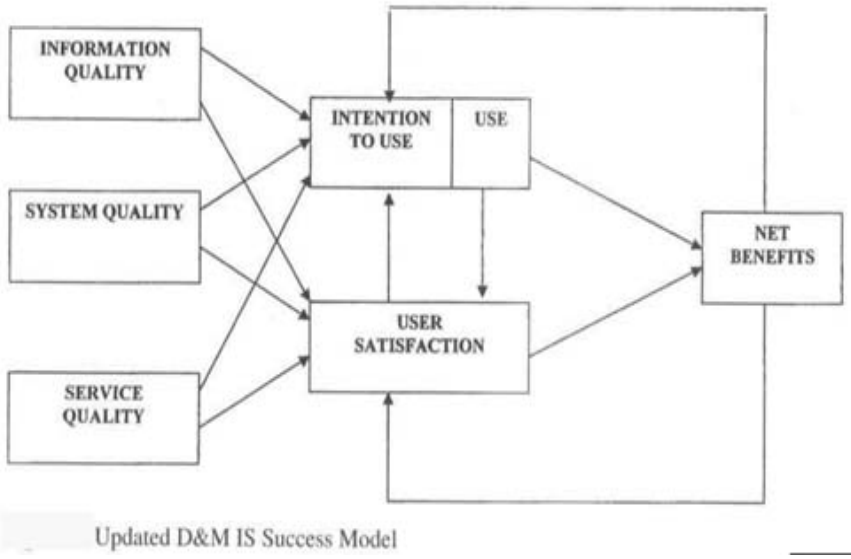

Fig 2.3 Updated D&M IS Success Model (DeLone and McLean, 2002; p24)

In 1992, DeLone and McLean (1992) put together the DeLone and McLean IS Success Model (see figure which is the updated version of the model) based on Communication Theory. Measurement of success is problematic , not least because the notion is ambiguous and unclear. Nevertheless it is necessary to assess the efficacy and value of a system for reasons we outlined in section 2.2.4. The model is based on theoretical and empirical IS research undertaken in the 1970s and1980s. “In the (original) D&M IS Success Model, "systems quality" measures technical success; "information quality" measures semantic success; and "use, user satisfaction, individual impacts," and "organizational impacts" measure effectiveness success” (DeLone and McLean (2003, p10). “Service Quality” was added to the 2003 version of the model as shown above. Other updates are found in the following: (Petter et al, 2012; Petter et al, 2013) The model is intended to be both a causal model (for example, B follows A) as well as a process model (for example, A causes B). Individual impacts lead to organisational impacts; system quality, information quality, service quality lead to intention to use, use, user satisfaction and so on. An indication of the model’s success is that the model has been adopted as a common framework for reporting and comparing IS success or effectiveness research work so it has helped to make it easier to compare different research findings.

2.3.5 Relevance of individual differences

There has been interest in the role of individual differences in the adoption, use and impact of IT since the late 1970s. For instance, Zmud (1979) proposed three categories of individual-difference variables: demographics, personality, and cognitive style. There could arguably be more categories - ability (intelligence) and motivation spring readily to mind – but this was a good starting list.

Since that time, other researchers have picked up on this strand of research (e.g. Igbaria and Parasuraman, 1989; Agarwal and Prasad, 1999; Compeau et al, 1999; Burton-Jones and Hubona, 2005). Burton-Jones and Hubona (2005), in particular, make a strong case for continuing to research this area as they found differences in frequency and volume of IT use not predicted by TAM.

Meanwhile, in the strategy literature, microfoundations are now currently receiving a lot of attention and dynamic managerial capabilities is an area of interest. This shift of focus from the organisational level down to the individual leaves room for more studies on individual differences (heterogeneity at the individuallevel) and how they can impact not only IT use but also on job performance and job satisfaction. This has implications for human capital (for example, training, coaching and mentoring) and also how to plan development paths for individual workers.

2.4 Need For Cognition construct

2.4.1 Explication

"Need For Cognition" has been defined as the "an individual's tendency to engage in and enjoy effortful cognitive activity" (Cacioppo et al 1984, p306). Putting it in another way, (Furnham and Thorne, 2013) consider NFC as "a motivation for cognitive challenge"(Fleischhauer et al, 2010; Hill et al, 2013) distinguished NFC from Intelligence but the NFC scale was correlated with Openness, Emotional Stability, and goal-oriented traits (Personality traits) but NFC was distinct from Personality (Furnham and Thorne, 2013)

Why is NFC important? The reason is that it determines how much cognitive effort will be expended. Most importantly it determines the cognitive processing mode employed and even decides how cognitive attention is allocated for a task.

To show the diversity of application of the NFC construct, (Furnham and Thorne, 2013; p230) lists the domains where NFC has been studied:
Health, false memory, learning and problem solving, ethnic prejudice, paranormal beliefs, advertising, lucid dreaming, intellectual task performance, decision making and website evaluations.
Since that list, another area where interest seems to be growing is education where NFC is known to play a part in student engagement initiatives through its dimensions of curiosity, perseverance, effort and complex problem solving.

2.4.2 Origins, lineage and applications

"Need For Cognition" was first used by Cohen, Stotland,and Wolfe (1955) when the psychology of needs was in its heyday, especially with the success of Maslow's Hierarchy of Needs (Maslow, 1970) being in everyone's minds at the time. He defined it as the "individual's tendency to organize his experience meaningfully" (Cohen, Stotland,and Wolfe,1955; p291).

However, the main inspiration for the construct was actually the achievement motivation construct (McClelland, Atkinson, Clark and Lowell, 1976). Cohen quickly dropped the name and it was much later in the early 1980s when it was picked up by Cacciopo and Petty (1982) who reconceptualised it away from early motivation psychologists with their language of energy and drive reduction. It now took on the form of a trait or disposition to engage in and enjoy thinking (Cacioppo et al,1986; Cacioppo et al,1996). The construct also became part of a larger theoretical framework, Elaboration Likelihood Model (Petty and Cacioppo,1986) with applications in advertising research concerning recall of messages (Cacioppo et al,1983).

(Lord and Putrevu, 2006) identified four dimensions of the NFC construct — the enjoyment of cognitive stimulation, preference for complexity, commitment of cognitive effort, and the desire for understanding. Individuals higher in NFC are more likely to attend to deeper levels of argument, be less concerned with aesthetics and be likely to use critical thinking.

Early work using the NFC construct in the area of advertising investigated the processing of advertising messages and how persuasive they were perceived to be (Petty and Cacioppo,1986).

2.4.3 User satisfaction connection

The NFC construct was envisaged to be domain free and was assumed to be generally applicable to various settings and situations. This does not mean that specific types of NFC cannot be explored. The connection with IT evaluation is that evaluation requires the use of cognitive processing and NFC predisposes IT users towards more elaborate processing (high in NFC) or simplified heuristic processing (low in NFC).

The general framework for understanding and explaining the use of NFC is the Elaboration Likelihood Model (Petty and Cacioppo,1986). High NFC individuals were likely to use elaborate processing before forming attitudes. An example given was voting behaviours of high voters were found to correspond better with their attitudes than those with low NFC.

Transferring this to the IT evaluation task, dual mode processing (Petty and Cacioppo,1986) may be used – a central vs peripheral route where the central involves more elaborate cognition and the peripheral more intuitive and heuristic cognition. Also, since NFC is predispostion towards cognitive motivation, IT users with high NFC are likely to expend more effort in the process than those with low NFC.

The amount of effort expended in evaluation will also vary between those with high vs low NFC as well as what attention is focussed upon (central vs peripheral messages) and the level of critical thinking (higher or lower level of cognition).

2.4.4 Development of the Long form and Short form scales

The original scale used was a Long form 34 item scale (Cacioppo and Petty, 1982).Its factor structure has been analysed and found to be unidimensional by (Cacioppo et al., 1984) and most other researchers (e.g. Sadowski and Gulgoz, 1992) since then. There was also short form 18 item scale developed (Cacioppo et al, 1984) and this was found also to be unidimensional by Sadowski (1993).The reliability of both of the scales has been tested with the Cronbach Alpha coefficients found to range between .75 and .90.

(Cacioppo et al., 1984) addressed the order effect of the Long form scale questionnaire and chose to reverse score some items to reduce response bias. In other words, the scoring was modified so that the polarity of the "right" answers was not so obvious for some items on the scale. This seems to have worked quite well.

The scale has proved very popular and has been translated into German, Turkish, Spanish, French and Chinese language versions. The Need For Cognition scale (especially the Short form) has been used in the many and diverse areas of research mentioned earlier with great success and reliability (Cronbach Alpha measuring mostly .90 and above).

2.4.5 Previous research in NFC and IT evaluation

To demonstrate the use of NFC in an IT context, some examples of research investigations are given below.

In a study on website design and evaluation, (Martin et al, 2004), it was found that individuals high in NFC evaluated more favourably, high verbal complexity and low visual complexity designs as against the opposite for low NFC individuals who favoured the aesthetics over the content of the message.
(Amichai-Hamburger et al, 2007) studied Internet use and especially the preference for interactivity. Individuals low in NFC preferred more interactive websites but the results were mixed for individuals high in NFC who were expected to explore more of the websites features and content and stay longer on the websites but did express a clear preference for interactivity.

Smartphone adoption was investigated in (Cho and Park, 2013). They found that perceived usefulness was had a stronger influence on behavioural intention (to adopt) for high-NFC people, whereas perceived ease of use were stronger for low-NFC people. This may be due to information processing differences among the potential adopters and the amount of effort the potential user might be willing to expend in the evaluation and the attention paid to particular features over others.

2.5 NFC in user satisfaction evaluation

2.5.1 Determinants of user satisfaction

According to the account given above, user satisfaction is caused or follows on from quite a number of factors. It's difficult to decide which factors should be in the model and which should be left out. It would be tempting to include everything that counts but this would result in an unwieldy model that may be very insightful.

Both the Technology Acceptance Model and the D&M IS Success Model have been shown to be effective in accounting for the variance in Success scores and so have been utilised to select the appropriate variables for this study.
The assumption made by the model above is that user individual differencesdo not have to be included in their models as they are more concerned with the actual perception and consequences of these than on what the antecedents are. The flaw in this reasoning is that the perceptions are themselves affected by personal factors such as disposition to think and this does matter as the evaluation exercise itself requires understanding of this aspect of the behavioural tendency and has to account for it. It's similar to saying that a view comes is a view from somewhere a and so the context and circumstances need to be taken into consideration.

2.5.2 Role of NFC

In both Technology Acceptance Model and the D&M IS Success Model, person who does the evaluation is assumed to be a neutral, rational, willing, knowledgeable and adequately competent participant. This is not often the case - or at least, sometimes, it's useful to know how participants differ. Especially, since we are trying nowadays to serve a customer of one (i.e. we individualise our offerings to the customer) there is utility in understanding how customers vary.

The reason for studying NFC in IT evaluation is that useful insight to the heterogeneity of users can be gleaned from this. More specifically we can learn something about the preferences for ways of cognitive processing of IT users and this information can then assist in interpreting the results of the evaluation. It can also be used to target more precisely activities to do with product/service design, development and implementation for particular kinds of users or adopting a more customer-centric approach to IT product development or services according to the NFC score the IT users have and also the kind of support needed.

The Short form scale developed by Caccioppo et al (1984) is a well respected instrument and has had good reports on its reliability and validity for the time that it has been available for use.

2.5.3 Working theory

The theories used in this investigation are an amalgamation of the ones previously used in IT evaluation, namely Technology Acceptance Model and DeLone and McLean IS Success Model which were themselves based on earlier theories (TRA, TPB and Communication Theory).
The external factors are:

Facilitating conditions: this covers everything that helps with the use of the IT system – user training, guidance, encouragement, leader endorsement, peer norms

System characteristics – sociomaterial features and IT functions and affordances

Task characteristics – the nature of the task

Use context – the work system and general context

The mediator components are:

Individual differences – the well known variables here are intelligence (ability), personality and motivation. NFC is the focal variable here and is an example of a cognitive motivation trait. It is difficult to know what interactions there might be between these three well known individual difference variable and is beyond the scope of this research to delve into this in sufficient depth.

Black Box – this contains unknown mechanisms for generating user satisfaction from features and affordances of the IT system and their associated sociomaterial contecxt, conditions, situation and environment. This may include perception of ease of use and usefulness (and their antecedents) used in TAM and System Quality, Information and Service Quality used in the D&M IS Success Model after being filtered through the lens of NFC.

User satisfaction – this is the output of the model.

2.5.4 Research model

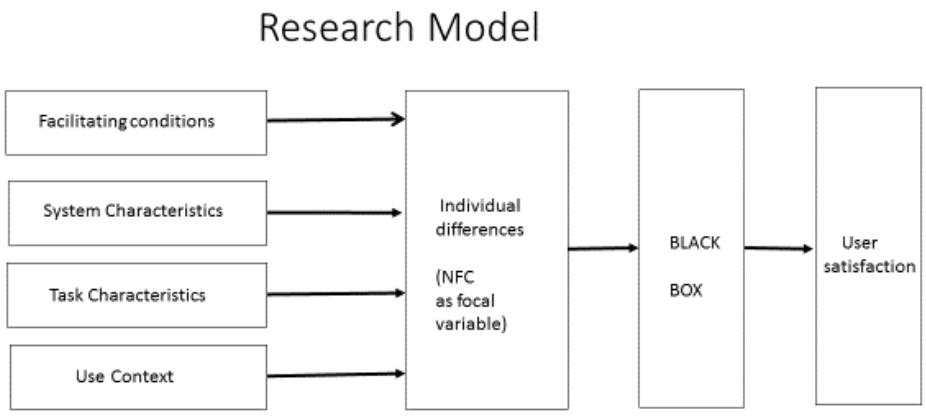

Fig 2.4 Research model adopted for this study (the author, 2018; adapted from Davis, 1992 and DeLone and McLean, 2002)

In this research investigation, the measuring instrument is used at the end of the chain of factors depicted above and having passed through the filter of individual differences including the focal variable of NFC score.

2.5.5 Research questions and hypotheses

To sum up the aims of this research:

Research question 1
How internally reliable is the “Need For Cognition” short form scale (Cacioppo et al, 1996, p. 253)? This is to confirm the conclusions of Cacioppo et al, (1984) and Sadowski (1993) in the particular context of this study.

Research question 2
How internally reliable is the “IT user satisfaction” scale developed for this website evaluation?

Research question 3
What is the relationship between “Need For Cognition” and “IT user satisfaction” constructs as measured by the scales employed?

Research question 4
To what extent does the variable “Need For Cognition” determine “IT user satisfaction” (the effect size) and how does this compare with the effect of the variables “gender”, “programme of study”, “perceived confidence with IT” and “perceived competence in using IT”?

The observations and analyses of the study below are at the level of the individual IS user.

The observations and analyses are on a single unit (the individual IS user).

The contribution of this research is that this is an under-researched area. There appears to be a continuity in the research stream building from the TAM model and DeLone and McLean model filling in the gaps left by these two models. IT user satisfaction is important as it is well known to be an important predictor of IS use (and continued use) and success in terms of organisational impact.

Deriving from the developments above, the hypotheses developed for this current research are as follows:

H1: There is high internal reliability (Cronbach Alpha of over 0.75) for the “Need For Cognition” short form scale

H2: There is high internal reliability (Cronbach Alpha of over 0.75) for the “IT user satisfaction” scale used for the website evaluation

H3: There is a small positive correlation (r between 0.1 and 0.20) between the “Need For Cognition” score and the “IT user satisfaction” score

H4: The relative importance of NFC is moderate compared with other variables in the model of determinants of “IT user satisfaction” e.g. “gender”, “perceived confidence with IT” and “perceived competence in using IT”.

In this chapter we have explained the various traditions for studying technology, organisation and individual differences ending with the specific hypotheses to be tested. This is essential in gaining a better understanding of the nature of technology and how individuals interact with it in an organisational and work context. This will also prove beneficial in envisioning and planning for the implications of changes when it comes to implementation of technological innovation and the continuance and effectiveness of technology use post-adoption. The next chapter details the methodological considerations relevant to the research as well as the precise steps taken in the conduct of the research and the measurement scales used.

Chapter 3 Research methodology

3.1 Assumptions of research

3.1.1 Philosophy

It is important to be clear about the philosophical assumptions underpinning any research investigation. This is because there are consequences of these assumptions in the choices to be made in the framing of research questions, the design and methodology of the research and also for how the findings are interpreted ultimately.

Philosophical considerations have to do with what exists (ontology), how we attain knowledge of something (epistemology) and what we value (axiology). Ontology is said to be prior to epistemology as logically we have to derive our epistemology from what ontology we commit to in the first place. There are two main schools of thought: realist and idealist with a third critical realist gaining in popularity over the last 20 years. Realists believe that there is a world independent of us while idealists believe that the world only exists as our ideas. Critical realism takes a position in between. There is an objective world out there. Some of it is inaccessible to us and the causal forces which act upon us (which can be actualised or not) can be physical as well as non-physical, for example, ideas or thoughts.

Epistemological positions for realism and idealism entail positivism and interpretivism respectively. Positivism is the scientific approach which relies on an objective world, takes a foundationalist/objectivist stance and has the aim of explaining and predicting and discovering causal laws especially in the natural world. Interpretivism has the aim of understanding and interpreting phenomena and experience and takes a subjectivist/relativist stance.

According to Becker and Niehaves (2007; p198), Chen and Hirschheim (2004) undertook an empirical study that analysed eight major IS publication outlets between 1991 and 2001 "…the examination of 1893 papers published in the American or European journals revealed that, at a methodological level, quantitative methods dominate US research on IS (71%), while 49% of papers published in the European journals apply qualitative methods. At the paradigmatic level, the vast majority (89%) of the US publications are characterized by a positivist paradigm. Although European journals also mainly publish research based on positivist principles (66%), they tend to be much more receptive to interpretivist research (34%) than US journals."
What the above shows is that the use of positivist paradigms which include realist ontology and epistemology is quite dominant in the US in IS research (approximately 90%). In Europe this is still the major proportion but it is down to about two thirds of the total.

3.1.2 Paradigms

Research paradigms embody approaches to the study of the natural and social world. These paradigms contain fundamental beliefs about the world and our ability to know about it. The table below is a useful summary and clear explanation of the main “schools of thought” about philosophy and axiology and the corresponding methodology that is associated with each school relevant to research endeavours.

In addition, there is also another paradigm which has been termed “critical” which has been identified by (Myers and Klein, 2011; p17) to be “concerned with social issues such as freedom, power, social control, and values with respect to the development, use, and impact of information technology” which had already been classified by (Orlikowski and Baroudi 1991) as a separate paradigm of IS research from “positivist” and “interpretivist”. It has also been called “transformative” as it seeks to uncover power and domination and oppression in organisations.

Critical realism has been heavily promoted recently (Dobson, 2001; Smith, 2006. Mingers, et al, 2013) as being a solution to a number of ontological problems, mostly to do with causation where the use of mechanisms in Critical Realism appears to enable explanations of reality of not just in the physical world (as in science) but also of the social (as in structuration and sociomateriality) as well. In other words, it is a neat package for studying and explaining IS research phenomena.

Epistemologically, positivists seek to come up with law-like geneneralisations using hypothetico-deductive reasoning and testing of theories, verifying or falsifying statements about reality. The aim is to predict, explain and control nature. An objective value free account is the goal of research. On the other hand, interpretivists seek understanding by observing interactions and trying to see how subjective meaning is constituted in this interaction. This kind of research is usually conducted in the field and by taking the subject’s perspective and experience as primary data. Cultural and contextual circumstances are given their due importance as well as the settings of the study. This is unlike the positivist paradigm whether the findings are taken to be generalizable everywhere and are supposed to be value free.

Table 3.1.1 Research paradigms (Wahyuni, 2012: p70)

	Research Paradigms			
Fundamental Beliefs	*Positivism (Naïve realism)*	*Postpositivism (Critical Realism)*	*Interpretivism (Constructivism)*	*Pragmatism*
Ontology: the position on the nature of reality	External, objective and independent of social actors	Objective. Exist independently of human thoughts and beliefs or knowledge of their existence, but is interpreted through social conditioning (critical realist)	Socially constructed, subjective, may change, multiple	External, multiple, view chosen to best achieve an answer to the research question
Epistemology: the view on what constitutes acceptable knowledge	Only observable phenomena can provide credible data, facts. Focus on causality and law-like generalisations, reducing phenomena to simplest elements	Only observable phenomena can provide credible data, facts. Focus on explaining within a context or contexts	Subjective meanings and social phenomena. Focus upon the details of situation, the reality behind these details, subjective meanings and motivating actions	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology: the role of values in research and the researcher's stance	Value-free and etic Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Value-laden and etic Research is value laden; the researcher is biased by world views, cultural experiences and upbringing	Value-bond and emic Research is value bond, the researcher is part of what is being researched, cannot be separated and so will be subjective	Value-bond and etic-emic Values play a large role in interpreting the results, the researcher adopting both objective and subjective points of view
Research Methodology: the model behind the research process	Quantitative	Quantitative or qualitative	Qualitative	Quantitative and qualitative (mixed or multi-method design)
Based on Saunders et al.(2009, p.119),Guba and Lincoln (2005), and Hallebone and Priest (2009)				

3.1.3 Methodology

Once the paradigm for the research has been decided, it is then necessary to choose a suitable research design and research to fit the nature of the

research questions, the investigation setting and context and organisational access conditions. The table below shows the options available for use:

3.1.4 Research Methods

There is then the need to decide whether a one method (mono-methodology) is used or a combination (pluralistic methodology or mixed/multi-methodology) and how this combination is structured and implemented. The purposes that might motivate the use of a mixed approach are well enumerated listed in the table below (Venkatesh et al, 2013; p26).

Table 3.1.2 Purposes of Mixed Methods Research (Venkatesh et al, 2013; p26)

Purposes of Mixed Methods Research*			
		Prior IS Research	
Purposes	Description	Examples**	Illustration
Complementarity	Mixed methods are used in order to gain complementary views about the same phenomena or relationships.	Soffer and Hader (2007)	A qualitative study was used to gain additional insights on the findings from a quantitative study.
Completeness	Mixed methods designs are used to make sure a complete picture of a phenomenon is obtained.	Piccoli and Ives (2003) Hackney et al. (2007)	The qualitative data and results provided rich explanations of the findings from the quantitative data and analysis.
Developmental	Questions for one strand emerge from the inferences of a previous one (sequential mixed methods), or one strand provides hypotheses to be tested in the next one.	Becerra-Fernandez and Sabherwal (2001) Ho et al. (2003) Grimsley and Meehan (2007)	A qualitative study was used to develop constructs and hypotheses and a quantitative study was conducted to test the hypotheses.
Expansion	Mixed methods are used in order to explain or expand upon the understanding obtained in a previous strand of a study.	Ang and Slaughter (2001) Koh et al. (2004) Keil et al. (2007)	The findings from one study (e.g., quantitative) were expanded or elaborated by examining the findings from a different study (e.g., qualitative).
Corroboration/ Confirmation	Mixed methods are used in order to assess the credibility of inferences obtained from one approach (strand).	Bhattacherjee and Premkumar (2004)	A qualitative study was conducted to confirm the findings from a quantitative study.
Compensation	Mixed methods enable compensating for the weaknesses of one approach by using the other.	Dennis and Garfield (2003)	The qualitative analysis compensated for the small sample size in the quantitative study.
Diversity	Mixed methods are used with the hope of obtaining divergent views of the same phenomenon.	Chang (2006)	Qualitative and quantitative studies were conducted to compare perceptions of a phenomenon of interest by two different types of participants.

*Adapted from Creswell (2003), Greene et al. (1989), and Tashakkori and Teddlie (2003a, 2008).

**Many of these examples can be placed in multiple purpose categories. For example, although Bhattacherjee and Premkumar's (2004) paper is placed in the corroboration/confirmation category, it can also be placed in the expansion category because the authors noted that, in addition to confirming the findings of the quantitative study, the purpose of the qualitative analysis was to "possibly gain additional insights into the nature and causes of the hypothesized associations" (p. 246).

The choice of methodology is based on the research goals and the usefulness of the methodology in successfully answering the research questions stipulated there. The preciseness of the questions will determine the utility of specific methods and also whether a mixed methodology is needed.

Alongside the decision above is also the decision regarding whether it is appropriate to mix paradigms (e.g. positivist and interpretivist) and hence to decide whether to collect quantitative data (e.g. from survey responses) or qualitative data (e.g. from interviews) or both.

As (Venkatesh et al, 2013; p26) shows, there are advantages in choosing a mixed approach. A common reason is for corroboration and confirmation or the triangulation approach which can involve the use of different research methods or of different data sources and informants for checking results.

The drawback to using a mixed methodology is the skills demand might be higher. Researchers are usually not evenly skilled in quantitative and qualitative data collection and usually have a strong preference for one or the other. In theory triangulation should provide rigour in cross checking results, however it can sometimes confuse matters if the results from different methods are incompatible or contradictory. Added to this, the beliefs, values and assumptions of the paradigms are quite different and incommensurable such that the paradigms talk to each other at cross-purposes. For instance, the interpretivist paradigm assumes that subjectivity is most important and understanding the individual context and experience is the key objective but the positivist paradigm is interested in generalisation to the population from individual measurements.

3.2 Research approach and strategy chosen

3.2.1 Research tradition: IS positivist methodology

(Chen and Hirschheim, 2004) reported that in the IS field, the dominant kind of empirical research is positivist research which makes up 81% of published research. Survey research is the most widely used method (41%), with case studies have gaining ground at 36%. There are others (in the minority) like laboratory experiments, field experiments, ethnography, phenomenology, action research and design science research which have their adherents and may be particularly appropriate for some purposes and settings.

In IT evaluation, survey research methodology is the most popular choice and both the TAM and D&M IS Success Models adopted this effectively. The reason for this is that their research models are variance models where variables are characterised as independent variables and a dependent variable (user satisfaction, use, or success). In this research, the dependent variable is IT user satisfaction and the main independent variable is the Need For Cognition. Survey research methodology is the clear cut choice in this situation and for this kind of investigation.

Also, one of the great advantages of the survey method is that it is very well established, having had a long history and tradition of use and is very well understood. Therefore, there are numerous sources for help and guidance on how to conduct surveys and analyse results which also give advice on how to avoid major and the most common errors (e.g. Pinsonneault and Kraemer,1993; Biemer, 2010).

The main drawback of a survey approach is that it doesn't offer the participant an opportunity to provide a thick, rich description of his/her experience which could provide an insider's view of the topic being investigated. The richness of the data could resolve ambiguities in the meaning of explanations offered by

the participants. Set against this, the survey approach is a neat, simple format that can be efficient in terms of time and cost to carry out and would be more straightforward to analyse to get clear results although the interpretation of the results may be more difficult without the rich, personal, situational and contextual information. There is, however, still the need for rigour in the use of this method as much as for interpretivist methods and the main objective is to generalise the findings to the population rather than to understand the user's experience or perspective.

3.2.2 Research approach – IT user satisfaction and Need For Cognition studies

The research approach adopted follows the format of previous IT user satisfaction studies i.e. survey research. This is useful because the methodology used earlier can be studied and learnt from to ensure precautions are taken in design and conduct of the investigation.

(Burton-Jones and Lee, 2017) usefully remind us that in measurement, success is down to both shared meaning of definitions and accuracy of measurement in the world. They explain that measurement is made up of two parts – the operationalisation of the construct (i.e. translating theoretical construct into operational terms) that needs shared agreement and the measurement accuracy of that operationalised construct which reflects the true value in the world (as would be expected with a positivist paradigm).

In this research, the operational definitions are as used in the extant research literature in both the IT user satisfaction and the Need For Cognition domains. This means that the main reliability and validity concerns are to do with the accuracy of measurement from the "real world".

Nevertheless, the usual careful attention to rigour is needed to ensure that the results are credible and trustworthy. Detailed descriptions will be given of the design and procedures in this research study to ensure transparency so that this study could be replicated to confirm its results desired.

As characterised in (Pinsonneault and Kraemer,1993), this study is about the relationship between variables, most importantly between two variables: Need For Cognition and IT user satisfaction. According to the authors, the question of whether a cross-sectional study is more appropriate or a longitudinal is one of the most critical to answer. In this particular research, a cross-sectional study is appropriate as an initial attempt to measure the association between the two variables. With regards to the purpose of the research, the authors also maintain that surveys are not always the best method for all kinds of research questions and that definitely "…surveys are less appropriate than other methods such as case studies and naturalistic observation when detailed understanding of context and history of given computing phenomena is desired" (Pinsonneault and Kraemer,1993; p78).

3.2.3 Research strategy – Online survey of student population

An online survey was developed using the QUALTRICS web-based platform. The platform is supported by the University of Kent and so this was the best choice (compared with, say, SurveyMonkey). It is easily accessible by students and offers good data management functions such as downloading to SPSS file format for easy analyses.

Various methods have been used for surveys the most common being mail, email, telephone (voice), text messages and the web. The advantages of using the web are the ease of setting up, low cost, ease of delivery of the survey to the respondent, ease of data entry (as mentioned above). However, as pointed out in (Fan and Yan, 2010), the response rate is often 11% lower than the other traditional methods, which can cause problems in terms of (non-response) bias in the sample. They also gave ways to increase likelihood of participation such as having interesting topic and content, contacting them in a more effective way rather than a blanket email, for example, and also using reminders. The task should also be straightforward and not require too much effort or time.

For easier accessibility and to increase likelihood of getting enough participants, the student population was taken as the pool for drawing a sample. However, as reported in (Porter and Umbach, 2006), there is quite a lot of heterogeneity in the response rates for student surveys across country locations as well as institutions. One finding was that the characteristics of the student - high performing students were found to be more likely to respond to surveys than lower ones. In other words, the easier accessibility may have to be traded off against a low response rate.

Also, it was hoped that if students knew the researcher personally, they might be more willing to participate. Thus, the survey was open only to two groups of students:

1) the researcher's seminar class students on CB733 Business Ethics (Stage 2 Module 2016 for Business students) who were offered the survey in Autumn Term 2016 (a total of 123 students)
2) all students who took the researcher's CB314 Mathematics and Statistics (Stage 1 Accounting and Finance Module 2015), who by this time were in Stage 2, who were offered the survey in Spring Term 2017 (a total of 140 students)

3.3 Survey research design and processes

3.3.1 Instrument design

In designing the research instruments, the literature on the topics of Need For Cognition and IS/IT user satisfaction was drawn upon for the items to be included in the scales and the order of inclusion of these items. The aim was to have a short form scale that would have only 20 - 24 items and only take about 10 to 20 minutes to complete. The aim was for an easy to use instrument

that would be brief, easily comprehensible, require minimal explanation and can be self-administered, for example, on an online platform, with little or no support necessary.

The Short form scale (Caccioppo et al, 1984) (see Appendix) used for the measurement of the Need For Cognition construct fits this requirement and is used exactly as is presented in the article mentioned above. It was felt that since the scale had already been well tested and validated and found to have high internal reliability, there was no necessity to alter it. The reverse scoring of some items was kept to help avoid response bias. This seemed to have worked well in past studies. It has succeeded even in non-English speaking countries having been translated into a number of different languages, namely German, French, Turkish and Spanish.

The IS/IT user satisfaction scale (see Appendix) adapted items from scales used for this purpose previously, going all the way back to (Bailey and Pearson, 1983; Ives et al,1983; Doll and Torkzadeh,1988; Melone,1990) and including more recent reviews of the IS/IT user satisfaction construct (e.g. Griffiths et al, 2007) which conclude that the construct is a complex one and needs careful examination when analysing and using it in practice.

Both TAM and D&M IS Success Model make use of this construct in testing their models. In both these models, user satisfaction is not the ultimate goal but a means to getting the right behaviour (IT use) which would lead to use, user satisfaction leading personal impact and then onward to organisational net benefits. In other words, satisfaction is a proxy for success which derives from the chain of events that start with user satisfaction being attained.

3.3.2 Research design and data collection procedures

As mentioned earlier, the research framework and design is based on well known IS evaluation studies of the past . The plan was to measure the two constructs using a sample from a reasonably accessible population, in this case, students in Kent Business School. As the research intent is that this be an exploratory study, the issue of generalisation of the findings to the population at large is less critical. Also, the IT system chosen to be evaluated was the website for Kent Business School which should be familiar to students at the school. It is an easily accessible IT system that can serve as platform for the IT task given to the user. The website had been redesigned and relaunched at the end of April 2017. This study (starting from October 2017) should give useful evaluation for the improved design. It was assumed that the students doing the website task had no previous experience of the website as the website was only recently revamped at the time of the study. In any case, the task for the participants was very specific and clear and so overall look and feel impressions from previous experience would have little bearing on their evaluation of the task.

The participants consisted of two groups of students in their Stage 2 year (the sample is drawn from Stage 2 students because of their experience of the IS service dimension which is needed in filling in the evaluation questionnaire).

As mentioned before, it was decided that the most efficient approach was to use Qualtrics and to conduct the survey online. The survey was designed to be completely undertaken online. The survey was launched in November 2017 (in week 5 of the Autumn Term). The participants (sample frame) comprised initially all students in my seminar classes for CB733 Business Ethics who were either International Business, Business Administration or Marketing students. The tasks were simple and not demanding in terms of time and effort for participants and should take less than 5 minutes to complete. A pilot study with 4 MSc students in KBS has already been conducted in July and August 2017 and the students did not raise any concerns about the instructions, procedures and instruments used and agreed that the tasks flowed effortlessly.

All the participants filled in the NFC scale questionnaire and also the IS evaluation questionnaire online on the Qualtrics website. The evaluation was performed shortly after experience of the task and the technological system. The website task instructions, procedures, and scale and evaluation questionnaires are found in the Appendix.

N.B. The Steps Recorder process was dropped after the first two weeks of the survey as it was posing a problem for Apple Mac users as this software was not available for them to use.

3.3.3 Further details on data collection procedures

The students for one group were invited (via face to face communication) during the seminar classes for CB733. The other group of former students of CB314 (now in Stage 2 of their studies were invited by a group email message. Responses were made confidential so student names were not revealed in the analyses. Reminders were sent out to the two groups by email every two weeks until the end of the two 12 week periods (i.e. Autumn and Spring Terms). In addition, students on CB733 were reminded in their seminar classes about taking part in the survey.

In this chapter we have delved into the methodological issues of the research investigation starting with the foundational assumptions and explaining the choices to be made in terms of design and procedure. We have also dealt with the statistical methodology and concerns that are part of such a research approach. We have detailed the precise steps taken in the research as well as the actual measurement scales used in the conduct of the survey. In the next chapter, we present the results of the survey as well as the data preparation and data quality checks that precede the analyse and presentation of results.

Chapter 4 Results

4.1 Data

As mentioned in the previous chapter, the survey was conducted completely online using the Qualtrics website platform. During the seminars, participants were offered £5 for enlisting in the study. Those students who agreed to take part were put on a mailing list so that they can be given access to the Qualtrics online survey. By the end of Autumn Term (December 2016) 42 students had undertaken the survey. Several reminders had to be sent to the whole cohort to encourage uptake of the survey. In addition reminders were given during the face-to-face seminars we had with the students. Out of 123 students in the seminars, 42 (34% response rate) volunteered to take part. 2 submissions were later found to be invalid (as they were completely blank) and were deleted. One student had a missing response for Question 11 of the website evaluation. This was filled by taking the modal value for that question (i.e. 6). The survey was designed in Qualtrics to alert participants if they left any item blank so it was surprising to encounter these invalid submissions.

To increase the size of the sample, the survey was later extended to Accounting and Finance Stage 2 students from January to April 2017. A group email was sent to students on the programme. Participants were offered £5 for agreeing to take part. Those students were then put on a mailing list so that they can access to the Qualtrics online survey. Out of 140 students, 28 (20% response rate) took part in the survey and all their submissions were valid. It should be noted that these were students that we had taught in the Stage 1 of their degree programme during 2015-16. Several reminders were emailed to the students to improve uptake of the survey. However, due to lack of face-to-face contact the response rate was understandably lower than for the other cohort. In the end, a total of 42 students participated in the Autumn Term and 28 students in the Spring Term.

4.2 Preparation of data for analysis

The data was downloaded from Qualtrics and exported in an SPSS file format using the commands on the menu: Data &Analysis/Data/Download Data Table.

IBM SPSS 25 and Microsoft Excel 2016 were used for all further data analyses.

4.2.1 Missing values

There were 68 valid submissions. Of these, there were 32 male students and 36 female students altogether for a sample size of 68. The number of participants who did the survey partially (or failed to complete the survey) was 23 which may be because the survey took close to 5 min to complete which may have been too much time to spare for some students. Overall, the

response rate, taking only the valid responses and the total available number of students of 263 turned out to be 25.9% (i.e. 68x100/263).

4.2.2 Checking for errors and outliers

There were no outliers. Responses which were incomplete were comprised of those that were only half completed. These had only the first scale completed i.e. the NFC scale. Perhaps they thought that was the entirety of the survey, in which case the instructions were not clear enough or it could be that they just ran out of time and didn't wish to go further as explained earlier. The entries were deleted from the survey.

4.3 Data after preparation checks

The data was downloaded from Qualtrics and exported in an SPSS file format using the commands on the menu: Data &Analysis/Data/Download Data Table.

IBM SPSS 25 and Microsoft Excel 2016 were used for all further data analyses. For future reference the complete data table is shown in Appendix B. As the text is quite small to so that the full table can fit onto the page, the full data in electronic form is available if the reader so wishes from the author upon request.

Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	NFC Score (%)	Eval(%)	Programme	Gender
1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1	2	7	5	5	5	5	6	5	6	6	5	6	6	6	5	5	5	4	7	6	61.9	100.0	1	2
2	6	6	5	6	7	6	6	6	5	3	6	6	6	5	6	5	5	5	6	1	2	6	4	4	6	6	6	4	5	6	7	5	5	7	6	5	6	5	5	6	61.9	79.4	1	2
3	5	5	5	6	6	6	7	7	7	5	6	6	5	6	6	5	6	6	7	1	1	7	5	6	6	6	4	5	4	3	3	7	6	6	4	6	6	4	6	6	61.1	83.3	1	1
4	6	5	5	5	6	6	6	6	5	5	5	5	6	6	5	3	4	3	4	1	2	5	6	6	6	6	6	6	3	6	4	6	7	6	5	5	4	2	6	6	60.3	73.0	1	2
5	6	6	6	5	4	5	6	6	4	5	7	6	5	7	6	3	6	4	7	1	2	7	6	5	6	6	7	7	2	5	6	5	7	7	3	3	5	2	2	2	63.5	77.0	1	2
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	2	6	4	5	6	6	6	5	4	4	4	4	6	6	4	4	4	6	7	5	66.7	85.7	1	2
7	7	7	7	6	7	7	6	5	6	6	6	6	6	6	6	6	6	6	6	1	2	7	4	5	6	4	5	3	6	2	4	6	6	6	5	6	4	6	6	6	63.5	88.9	1	2
8	7	7	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	5	6	1	1	6	5	7	7	6	7	5	6	5	6	6	7	6	5	5	6	7	6	6	69.1	85.7	1	1
9	7	6	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	7	1	1	7	5	6	6	6	6	6	6	6	6	6	6	6	2	6	6	6	5	6	68.3	96.8	1	1
10	5	4	2	5	3	3	5	5	3	3	3	3	4	3	3	5	5	5	7	1	2	7	3	5	6	6	5	6	4	3	3	6	7	7	4	5	6	3	5	7	59.5	54.8	1	2
11	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	1	2	5	7	4	5	3	3	4	3	3	4	5	5	4	3	3	4	4	5	5	57.1	69.1	1	2
12	7	7	7	7	7	7	7	5	7	7	7	7	7	7	7	7	7	7	7	1	1	6	3	5	4	1	3	1	3	6	4	4	5	2	5	6	3	4	3	4	47.6	98.4	1	1
13	7	6	7	6	7	7	7	7	7	6	6	7	7	7	6	6	7	7	7	1	1	7	7	7	7	7	7	5	3	3	3	6	7	7	6	5	6	6	7	5	68.3	95.2	1	1
14	6	6	6	6	6	6	6	6	4	4	6	6	4	6	6	6	6	6	6	1	2	7	5	5	5	5	4	6	2	4	3	6	6	6	5	4	4	5	3	3	58.7	81.0	1	2
15	6	6	6	6	6	6	6	6	6	5	6	6	5	4	6	6	4	2	6	2	2	6	3	5	6	6	6	3	2	6	2	5	5	2	3	3	5	6	2	3	53.2	77.8	1	2
16	6	5	5	6	5	5	6	6	5	6	5	5	6	5	5	6	5	5	6	1	1	5	6	6	4	6	3	6	3	5	4	5	6	5	6	4	5	6	4	5	56.4	77.0	1	1
17	3	6	3	5	7	7	6	6	6	2	3	6	6	6	6	3	6	6	3	1	1	6	2	3	4	4	2	6	2	2	2	5	6	4	3	3	2	3	6	6	51.6	73.8	1	1
18	2	3	1	3	7	7	7	6	6	1	2	5	4	4	2	4	6	5	5	1	2	7	2	6	7	6	7	4	4	3	4	4	6	5	5	6	7	6	7	4	65.9	59.5	1	2
19	5	6	5	6	7	7	7	7	6	4	6	7	5	6	6	5	7	6	6	1	1	6	6	6	5	5	4	4	6	4	5	5	6	6	5	5	5	3	4	6	4	65.1	85.7	1	1
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	2	6	3	5	6	6	3	2	2	5	2	7	5	5	3	3	2	2	2	2	51.6	85.7	1	2
21	6	6	6	5	6	6	6	6	6	5	6	6	6	5	6	5	6	6	6	1	2	6	5	5	5	6	4	3	5	5	5	5	5	5	5	3	6	6	5	3	6	59.5	82.5	1	2
22	5	5	5	3	5	5	5	4	5	5	5	5	5	4	5	3	5	5	5	1	2	6	5	5	3	5	5	3	2	5	3	5	5	5	5	3	3	7	2	5	6	50.0	66.7	1	2
23	6	6	5	4	4	5	6	7	6	5	5	6	5	4	6	6	5	7	7	1	2	7	5	4	6	3	6	3	6	3	3	5	7	4	5	7	6	5	3	6	56.4	77.8	1	2
24	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	1	2	7	6	6	6	6	6	6	2	3	4	5	6	6	5	6	5	6	3	6	64.3	85.7	1	2
25	5	5	4	5	4	5	4	5	4	5	4	5	5	4	5	5	5	5	5	1	1	5	5	3	2	6	5	4	5	3	3	5	5	4	4	3	5	5	6	4	56.4	66.7	1	1
26	6	5	6	6	5	5	6	6	5	6	6	5	6	5	6	4	6	6	6	1	2	6	2	5	3	5	2	3	5	3	2	6	5	3	3	5	5	1	6	6	49.2	79.4	1	2
27	4	3	6	3	6	3	5	3	6	3	5	3	3	6	3	3	3	6	7	1	1	7	3	2	2	6	6	2	6	6	5	6	6	4	5	5	2	6	3	6	56.4	58.7	1	1
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32	7	6	7	5	7	3	4	7	7	7	7	7	7	7	7	6	4	4	7	1	1	7	1	1	1	1	1	1	1	1	7	7	1	7	1	1	7	1	1	1	42.9	86.5	1	1
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38	5	5	5	2	6	6	6	6	6	4	6	6	6	4	5	4	5	5	7	1	1	4	5	6	5	4	5	2	2	7	5	6	6	5	7	6	6	2	1	7	45.2	73.0	1	1
39	1	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	6	6	6	6	6	6	2	2	2	6	5	6	6	3	3	5	5	5	63.5	78.6	2	1
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42	5	5	5	2	6	5	6	6	6	5	6	5	5	3	6	5	3	6	4	6	1	2	6	2	4	4	7	4	4	7	4	4	4	6	6	4	6	6	3	5	7	57.9	70.6	2	2
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44	6	6	6	6	4	6	6	6	6	5	6	6	6	6	6	6	6	4	5	1	2	4	4	5	5	5	5	4	3	5	5	7	6	5	5	5	4	1	5	5	54.0	81.8	2	2
45	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	5	6	6	6	6	6	6	5	6	6	6	2	6	6	4	6	6	6	61.9	85.7	2	1
46	6	6	6	6	6	6	6	6	6	5	6	5	6	5	6	5	4	4	7	1	1	7	5	4	5	5	6	3	5	4	3	4	5	5	3	4	6	5	2	3	59.5	79.4	2	1
47	4	6	6	6	6	6	6	7	6	4	5	5	5	6	5	6	5	6	6	1	1	6	6	6	2	3	4	2	7	5	4	5	3	6	4	4	6	2	2	6	53.2	79.4	2	1
48	5	5	6	6	7	7	7	5	5	4	5	6	5	4	5	5	5	5	6	1	1	7	5	6	6	6	5	4	3	5	4	6	6	5	4	5	5	5	3	5	58.7	77.0	2	1
49	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	5	6	6	3	2	6	2	2	2	5	6	6	6	3	6	2	3	4	51.6	85.7	2	1
50	5	7	6	3	5	5	5	5	6	6	5	6	5	6	6	5	6	5	5	1	2	7	5	6	6	7	7	4	7	7	6	4	6	7	6	4	5	6	7	5	69.1	76.2	2	2
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66	4	4	4	4	4	5	5	5	6	6	6	6	5	6	7	6	6	6	5	1	1	7	5	6	7	4	5	5	2	3	4	5	6	4	6	5	4	5	5	3	61.9	75.4	2	1
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68	7	7	7	5	7	7	7	7	7	5	7	7	7	6	7	7	7	6	7	1	1	7	6	7	6	6	6	6	3	7	6	6	4	6	6	5	6	6	5	7	64.3	95.2	2	1
Mean	5.5	5.6	5.6	5.2	5.9	5.9	5.9	5.7	5.8	5.1	5.7	5.7	5.7	5.6	5.7	5.3	5.6	5.4	6.0	1.0	1.5	6.1	4.6	5.1	5.1	5.0	4.8	4.1	4.0	4.2	4.0	5.3	5.4	5.3	4.4	4.7	4.8	3.9	4.8	4.9	59.1	80.2		
Std dev	1.4	1.2	1.2	1.3	1.0	1.0	0.7	0.9	0.8	1.2	1.0	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.2	0.5	1.0	1.4	1.2	1.4	1.5	1.5	1.5	1.7	1.5	1.4	0.9	1.2	1.2	1.4	1.3	1.4	1.5	1.7	1.4	5.9	9.1		
Min	1	1	1	2	3	3	4	3	3	1	2	3	3	3	2	3	3	2	3	1	1	3	1	1	1	1	1	1	1	1	1	3	1	2	1	1	2	1	1	1	42.9	54.8		
Max	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	2	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	69.8	100.0	1=business	1=male
																																										2=accountin	2=female
																																								Count	1	40	32
																																									2	28	36
																																								Total		68	68

Table 4.1 Data matrix

4.4 Descriptive statistics

4.4.1 18 Item NFC Scale

*Items starred are reverse scored in the computation of the NFC score. For example, if the participant chose 1 as the response, (8 - 1) i.e. 7 would be added to the score instead. The participants were not informed which of the items were of this kind. The purpose of this is to reduce the likelihood of responding with high number answers in order to enhance the participant's own social desirability with a high scale score.

1 means strongly disagree and 7 means strongly agree

Short Form of the Need for Cognition Scale
(Cacioppo et al, 1984; p307;1996; p253)
Instructions: For each of the statements below, the participants were asked to indicate to what extent they agree with the statement.

1= Strongly disagree
2= Disagree
3= Somewhat disagree
4= Neither agree nor disagree
5= Somewhat agree
6= Agree
7= Strongly agree

To make the results easier to understand, we shall adopt the following classification for the mean values below:

6 and above = high
More than or equal to 5 and less than 6 = high moderate
More than or equal to 4 and less than 5 = moderate
More than or equal to 3 and less than 4 = low moderate
More than or equal to 2 and less than 3 = low
Less than 2 = very low

From the data matrix (table 4.1) above:
Overall Mean for NFC score = 59.1% Standard deviation: 5.9%
The mean level of NFC is moderate (59.1% of 7 = 4.1)

It should be emphasised that the two instruments used are scale measures so the items should not be analysed individually too much because it is the full scale score that yields the level of the target construct. Nevertheless, a detailed breakdown of the two scales, is presented below to be comprehensive.

Items from the survey instrument:

1. I would prefer complex to simple problems.
1 2 3 4 5 6 7

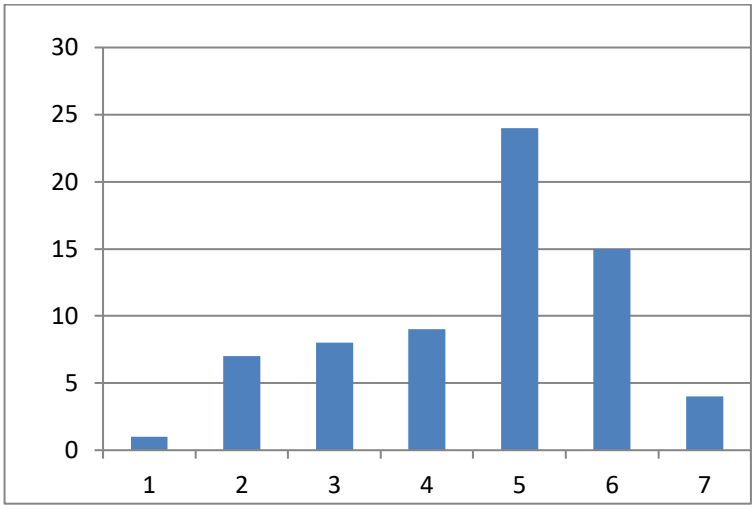

Fig 4.1 B1 Response

Mean	4.6
Std dev	1.4
Min	1
Max	7

There was moderate agreement to this statement.

2. I like to have the responsibility of handling a situation that requires a lot of thinking.

1 2 3 4 5 6 7

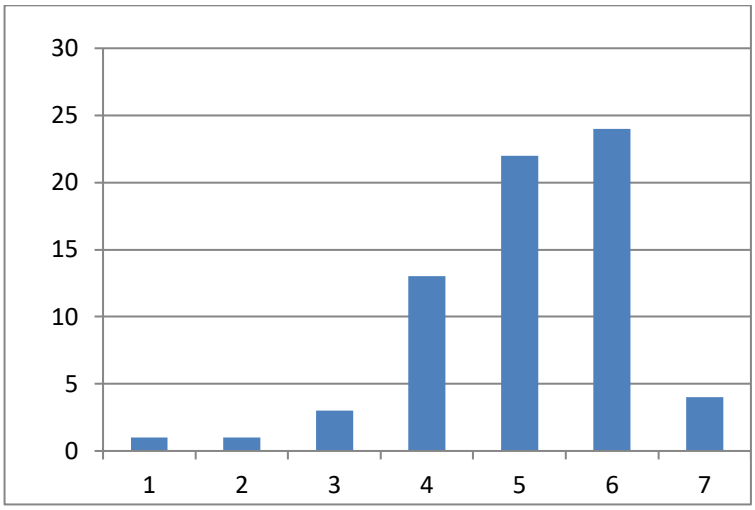

Fig 4.2 B2 Response

Mean	5.1
Std dev	1.2
Min	1
Max	7

There was high moderate agreement to this statement.

3. Thinking is not my idea of fun. *

1 2 3 4 5 6 7

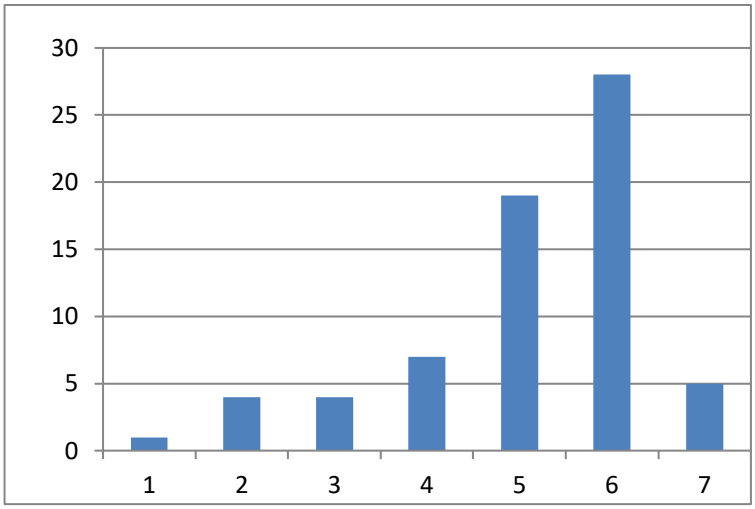

Fig 4.3 B3 Response

Mean	5.1
Std dev	1.4
Min	1
Max	7

There was high moderate agreement to this statement. However this a reverse score item so the real score = (8 - 5.1) = 2.9 which is low agreement.

4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*

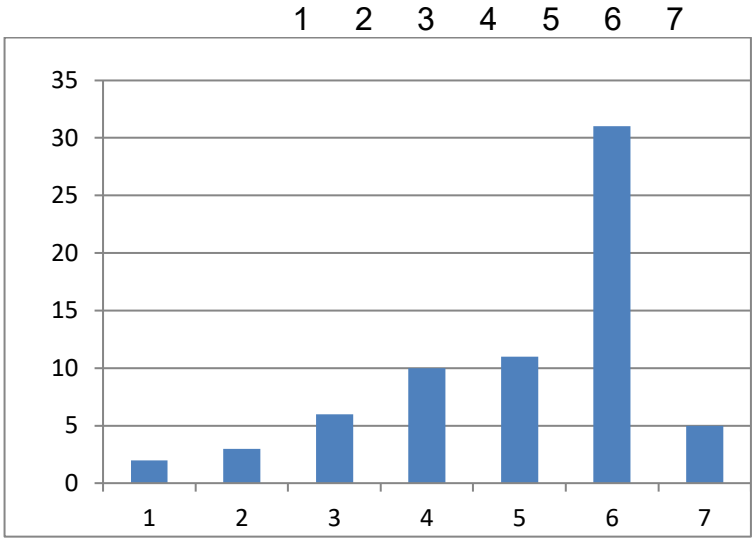

Fig 4.4 B4 Response

Mean	5.0
Std dev	1.5
Min	1
Max	7

There was high moderate agreement to this statement. However this a reverse score item so the real score = (8 - 5.0) = 3.0 which is low moderate agreement.

5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.*

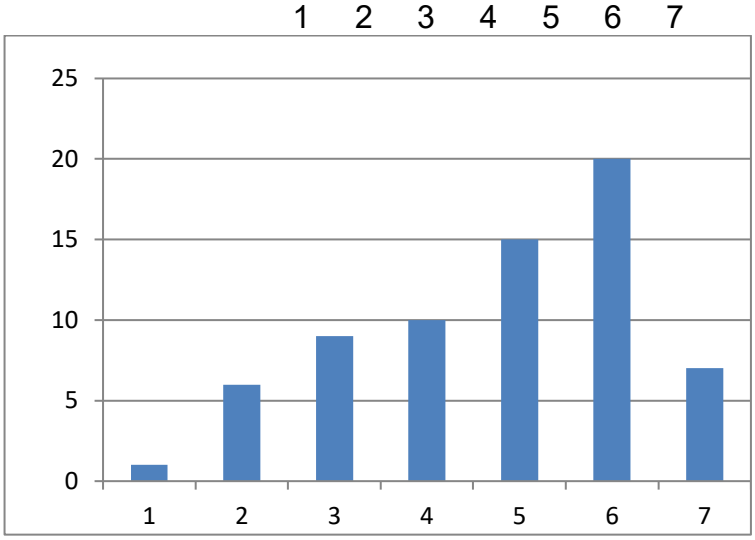

Fig 4.5 B5 Response

Mean	4.8
Std dev	1.5
Min	1
Max	7

There was moderate agreement to this statement. However this a reverse score item so the real score = (8 - 4.8) = 3.3 which is low moderate agreement.

6. I find satisfaction in deliberating hard and for long hours.

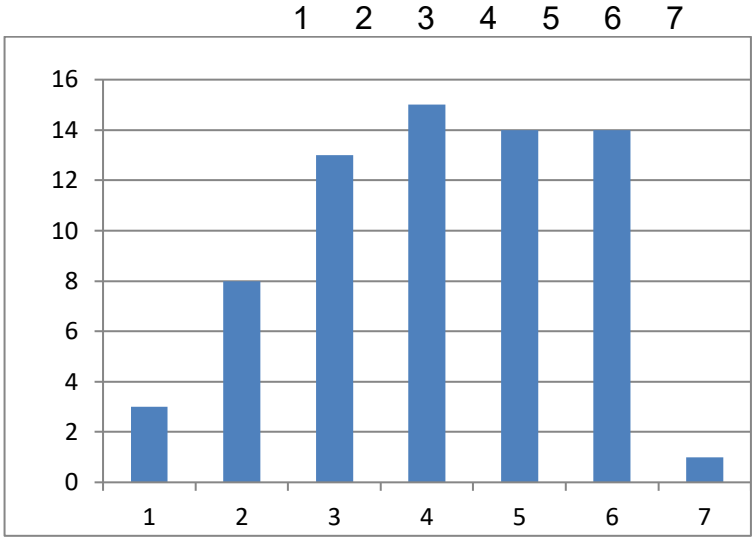

Fig 4.6 B6 Response

Mean	4.1
Std dev	1.5
Min	1
Max	7

There was moderate agreement to this statement.

7. I only think as hard as I have to.*

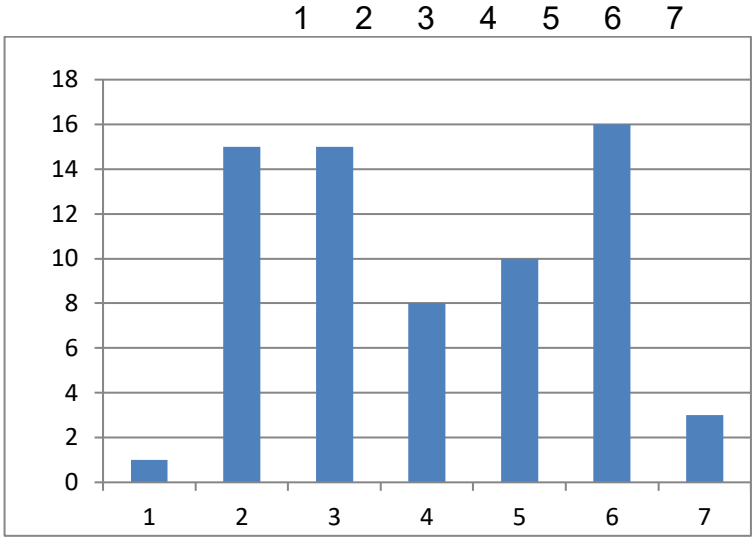

Fig 4.7 B7 Response

Mean	4.0
Std dev	1.7
Min	1
Max	7

There was moderate agreement to this statement. However this a reverse score item so the real score = (8 – 4.0) = 4.0 which is moderate agreement.

8. I prefer to think about small, daily projects to long-term ones.*

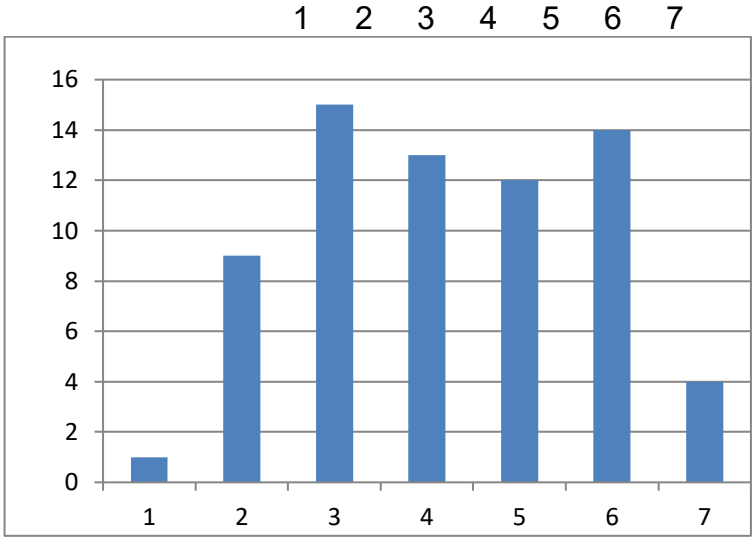

Fig 4.8 B8 Response

Mean	4.2
Std dev	1.5
Min	1
Max	7

There was moderate agreement to this statement. However this a reverse score item so the real score = (8 – 4.2) = 3.8 which is low moderate agreement.

9. I like tasks that require little thought once I've learned them.*

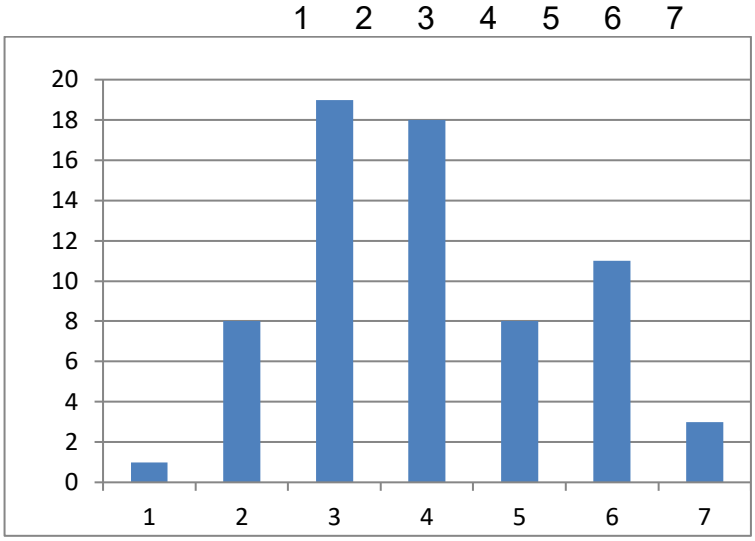

Fig 4.9 B9 Response

Mean	4.0
Std dev	1.4
Min	1
Max	7

There was moderate agreement to this statement. However this a reverse score item so the real score = (8 – 4.0) = 4.0 which is moderate agreement.

10. The idea of relying on thought to make my way to the top appeals to me.

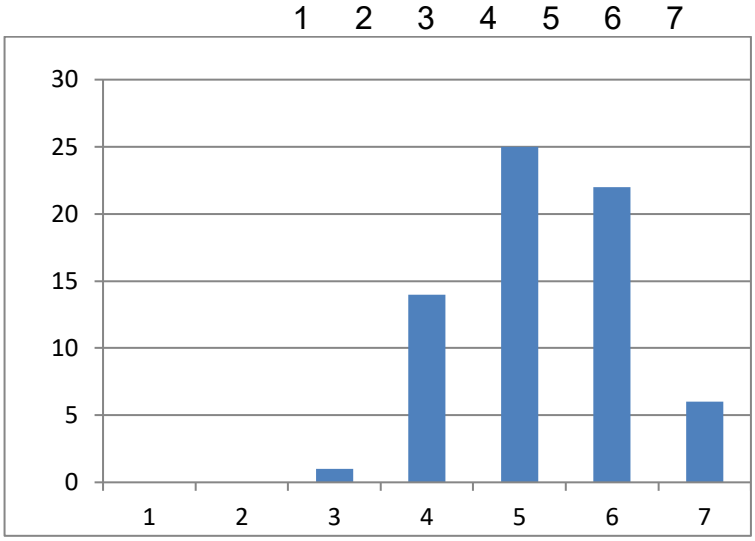

Fig 4.10 B10 Response

Mean	5.3
Std dev	0.9
Min	3
Max	7

There was high moderate agreement to this statement.

11. I really enjoy a task that involves coming up with new solutions to problems.

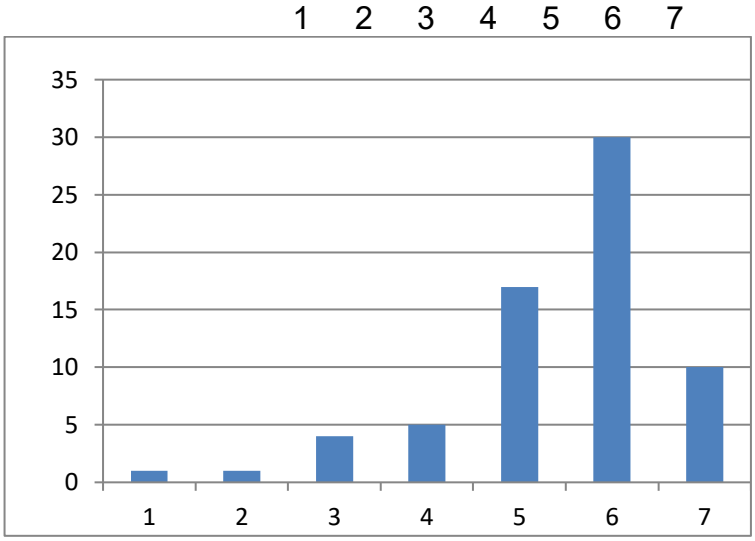

Fig 4.11 B11 Response

Mean	5.4
Std dev	1.2
Min	1
Max	7

There was high moderate agreement to this statement.

12. Learning new ways to think doesn't excite me very much.*

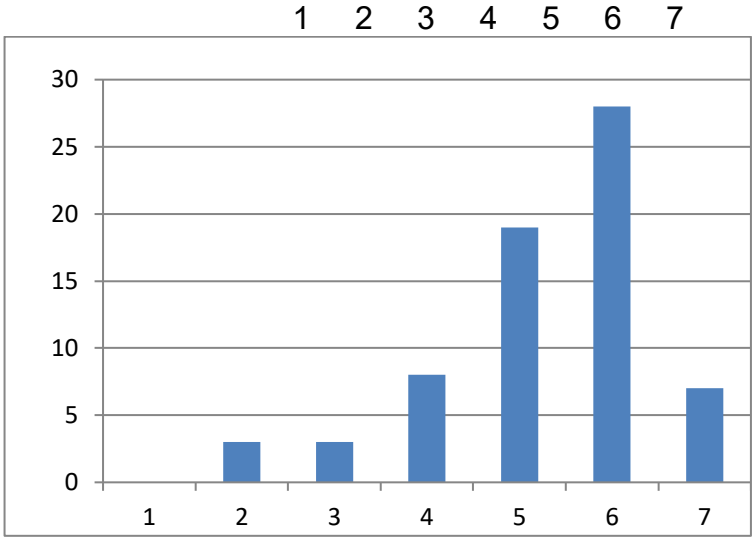

Fig 4.12 B12 Response

Mean	5.3
Std dev	1.2
Min	2
Max	7

There was high moderate agreement to this statement. However this a reverse score item so the real score = (8 – 5.3) = 3.7 which is low moderate agreement.

13. I prefer my life to be filled with puzzles that I must solve.

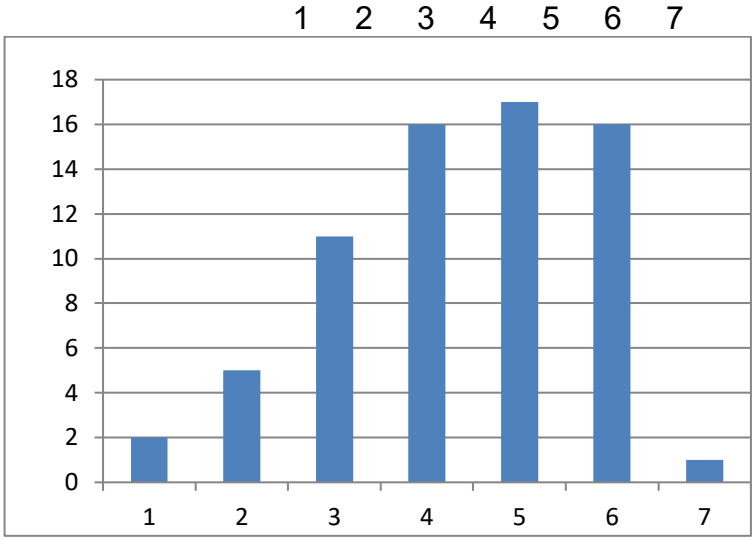

Fig 4.13 B13 Response

Mean	4.4
Std dev	1.4
Min	1
Max	7

There was moderate agreement to this statement.

14. The notion of thinking abstractly is appealing to me.

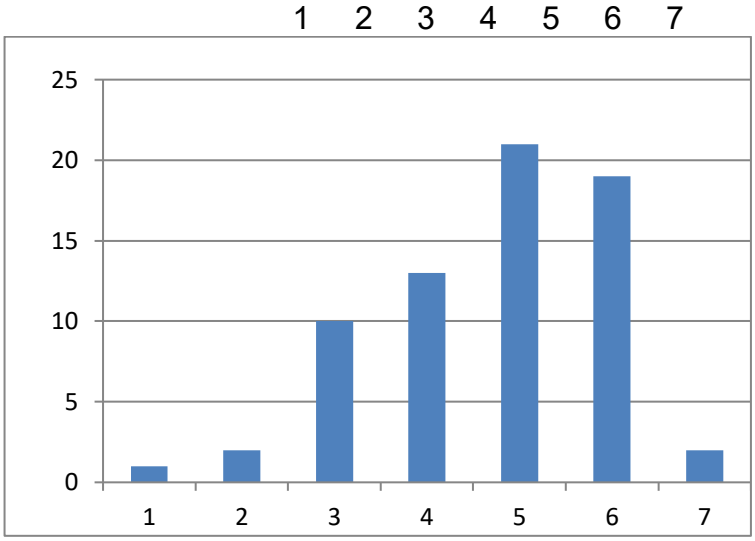

Fig 4.14 B14 Response

Mean	4.7
Std dev	1.3
Min	1
Max	7

There was moderate agreement to this statement.

15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

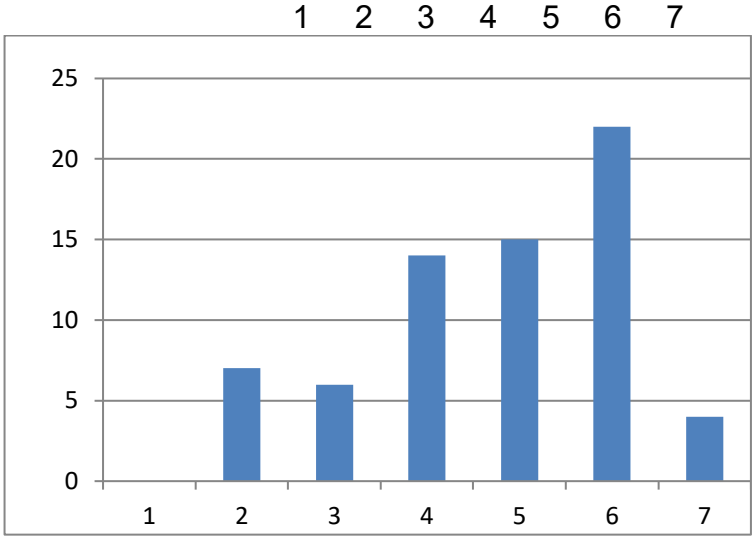

Fig 4.15 B15 Response

Mean	4.8
Std dev	1.4
Min	2
Max	7

There was moderate agreement to this statement.

16. 1 feel relief rather than satisfaction after completing a task that required a lot of mental effort.*

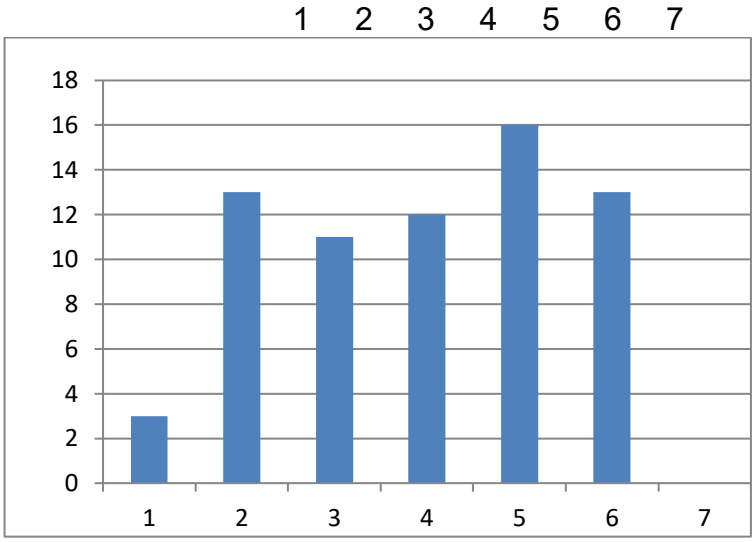

Fig 4.16 B16 Response

Mean	3.9
Std dev	1.5
Min	1
Max	6

There was low moderate agreement to this statement. However this a reverse score item so the real score = (8 – 3.9) = 4.1 which is moderate agreement.

17. It's enough for me that something gets the job done; I don't care how or why it works.*

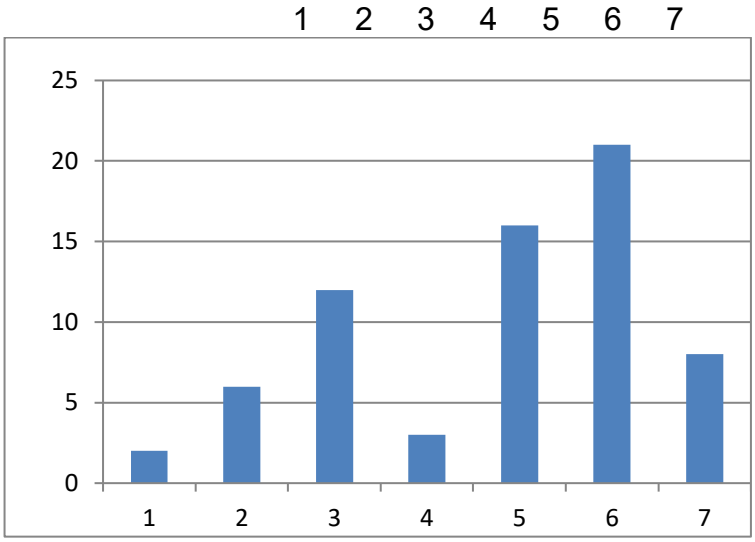

Fig 4.17 B17 Response

Mean	4.8
Std dev	1.7
Min	1
Max	7

There was moderate agreement to this statement. However this a reverse score item so the real score = (8 – 4.8) = 3.2 which is low moderate agreement.

18. I usually end up deliberating about issues even when they do not affect me personally.

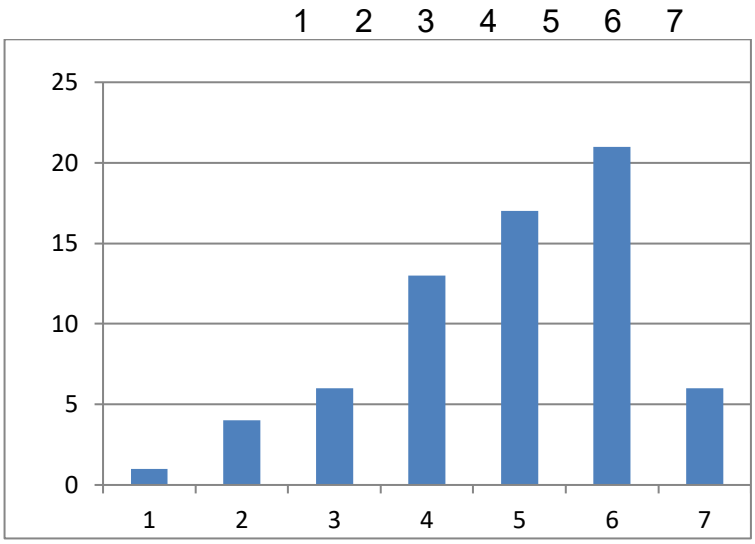

Fig 4.18 B18 Response

Mean	4.9
Std dev	1.4
Min	1
Max	7

There was moderate agreement to this statement.

In summary:

From the data matrix (table 4.1) above, the overall Mean for NFC score = 59.1% and the Standard deviation = 5.9%
Calculating 59.1% of 7 = 4.1 gives us the conclusion that the mean level of NFC is moderate according to our earlier classification.
There was moderate agreement to most of the statements on the scale. The interesting changes were with the statements which were reverse scored where there was more variation in the responses, mostly showing low moderate agreement instead of moderate agreement.

4.4.2 Website evaluation questionnaire

1= Strongly disagree
2= Disagree
3= Somewhat disagree
4= Neither agree nor disagree
5= Somewhat agree
6= Agree
7= Strongly agree

As for the NFC scale, to make the results easier to interpret, we shall adopt the following classification for the mean values below:
6 and above = excellent
More than or equal to 5 and less than 6 = very good
More than or equal to 4 and less than 5 = good
More than or equal to 3 and less than 4 = average
Below 3 = below average

Items from the survey instrument:

System quality

Our website is:

Q1 Easy to understand in terms of layout

1 2 3 4 5 6 7

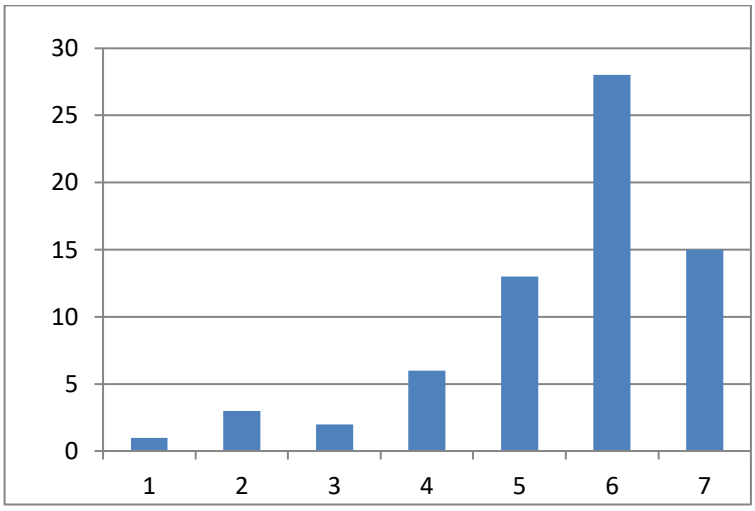

Fig 4.19 Q1 Response

Mean	5.5
Std dev	1.4
Min	1
Max	7

User satisfaction was at a very good level.

Q2 Equipped with useful features and functions

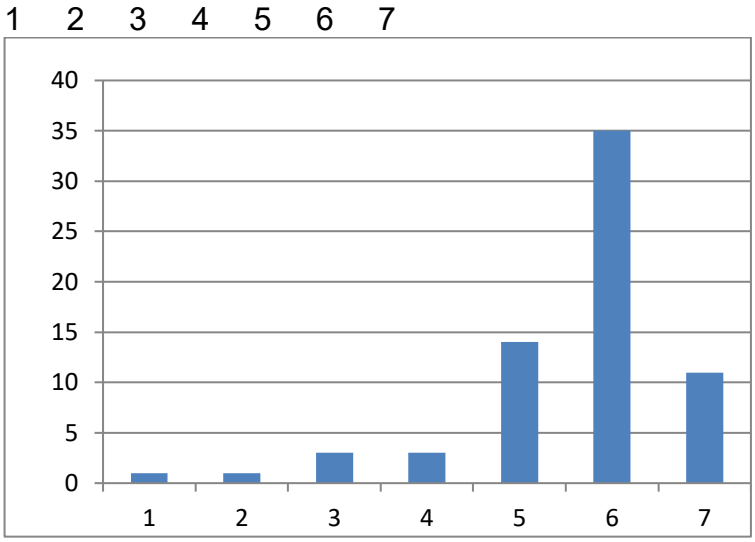

Fig 4.20 Q2 Response

Mean	5.6
Std dev	1.2
Min	1
Max	7

User satisfaction was at a very good level.

Q3 User-friendly

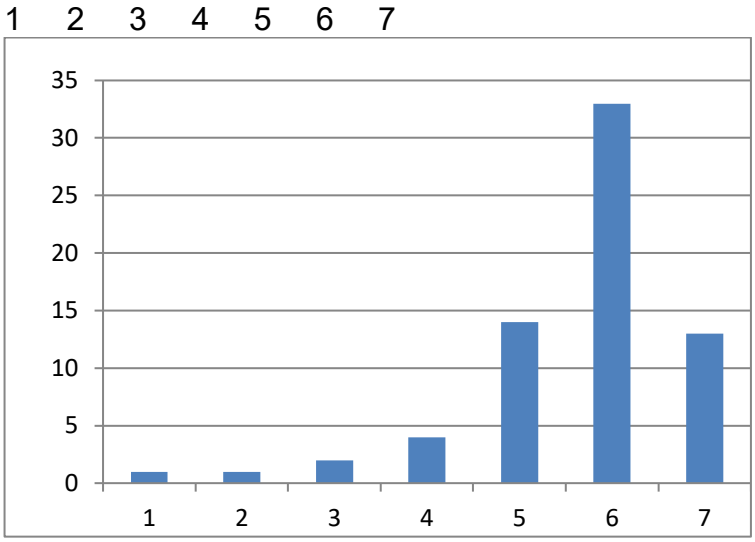

Fig 4.21 Q3 Response

Mean	5.6
Std dev	1.2
Min	1
Max	7

User satisfaction was at a very good level.

Q4 Aesthetically pleasing

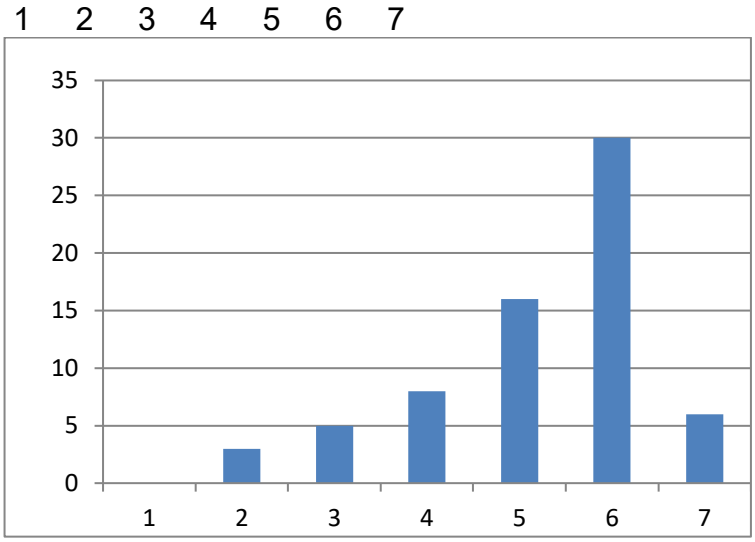

Fig 4.22 Q4 Response

Mean	5.2
Std dev	1.3
Min	2
Max	7

Comments: User satisfaction was at a very good level.

Q5 Available 24X7 with very low downtime

1 2 3 4 5 6 7

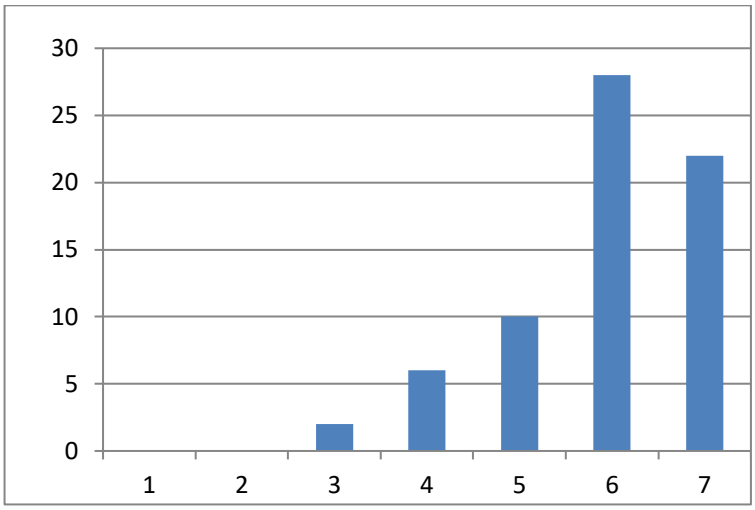

Fig 4.23 Q5 Response

Mean	5.9
Std dev	1.0
Min	3
Max	7

Comments: User satisfaction was at a very good level (near excellent).

Q6 Fast loading and has fast response time

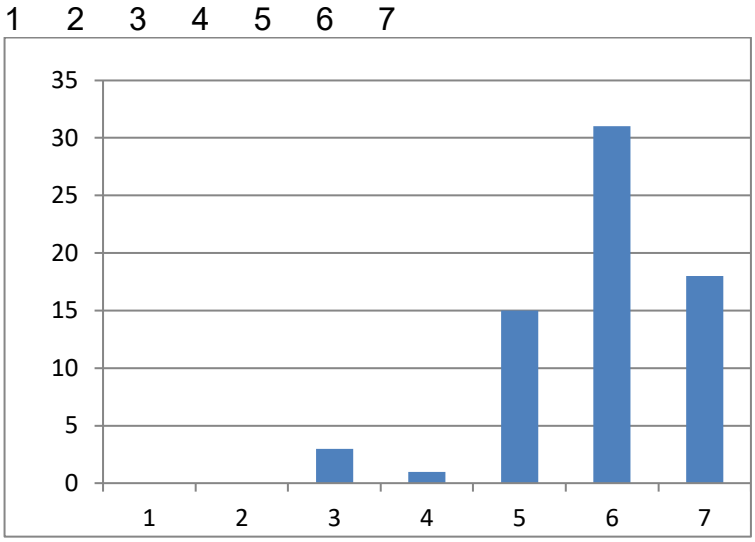

Fig 4.24 Q6 Response

Mean	5.9
Std dev	1.0
Min	3
Max	7

Comments: User satisfaction was at a very good level (near excellent).

Information quality

Our information is:

Q7 Accurate

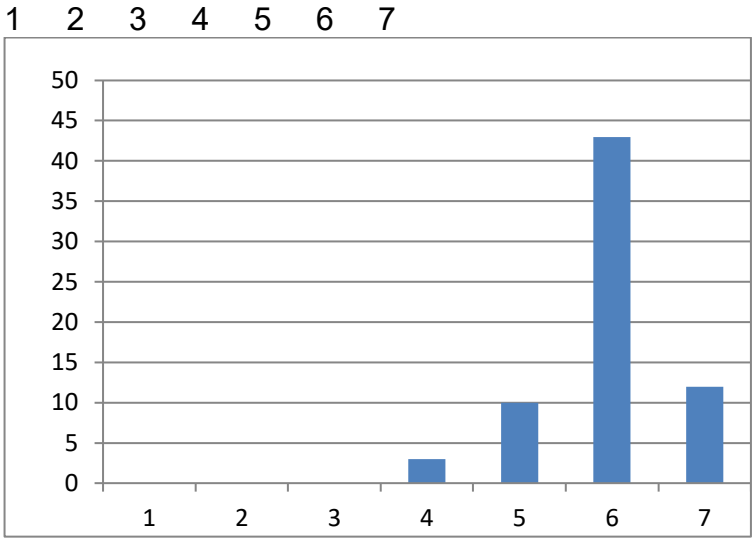

Fig 4.25 Q7 Response

Mean	5.9
Std dev	0.7
Min	4
Max	7

User satisfaction was at a very good level (near excellent).

Q8 Complete

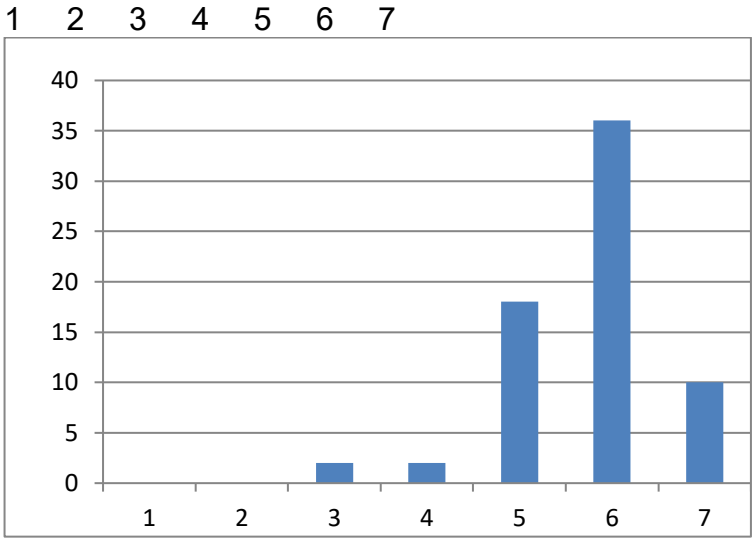

Fig 4.26 Q8 Response

Mean	5.7
Std dev	0.9
Min	3
Max	7

User satisfaction was at a very good level (near excellent).

Q9 Concise

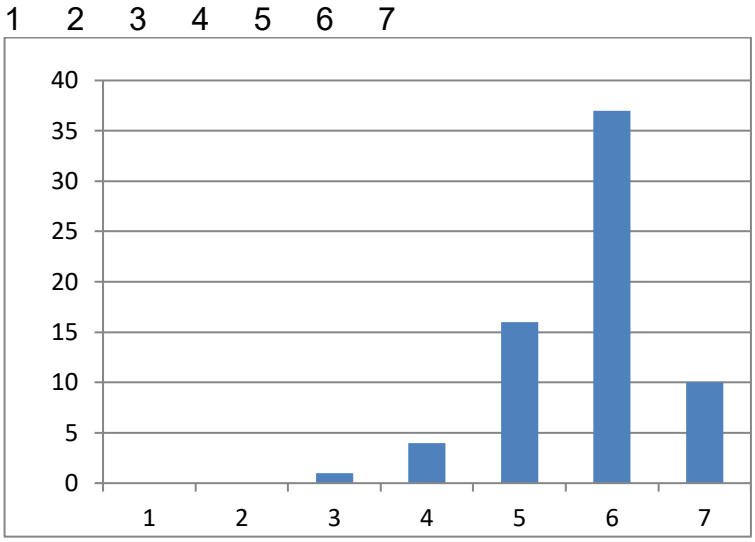

Fig 4.27 Q9 Response

Mean	5.8
Std dev	0.8
Min	3
Max	7

User satisfaction was at a very good level (near excellent).

Q10 Easy to find

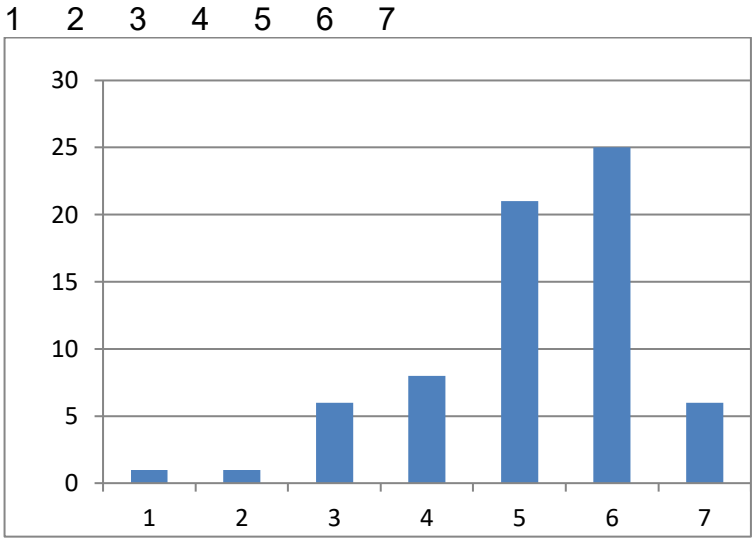

Fig 4.28 Q10 Response

Mean	5.1
Std dev	1.2
Min	1
Max	7

User satisfaction was at a very good level.

Q11 Available in a useful format

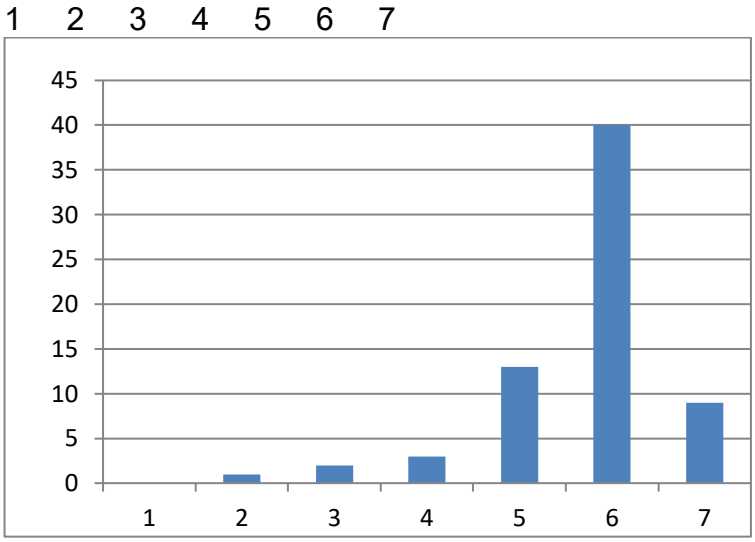

Fig 4.29 Q11 Response

Mean	5.7
Std dev	1.0
Min	2
Max	7

User satisfaction was at a very good level (near excellent).

Q12 Relevant for decision making

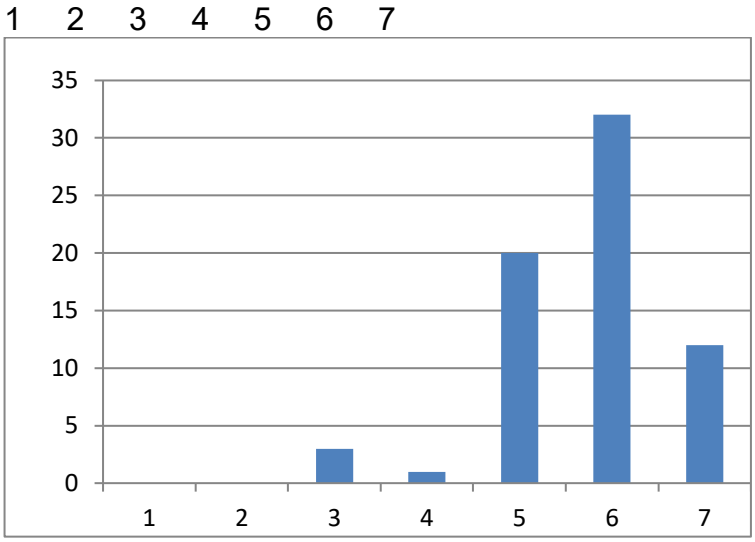

Fig 4.30 Q12 Response

Mean	5.7
Std dev	0.9
Min	3
Max	7

User satisfaction was at a very good level (near excellent).

Service quality

Our service is:

Q13 Clear to users as to what is available

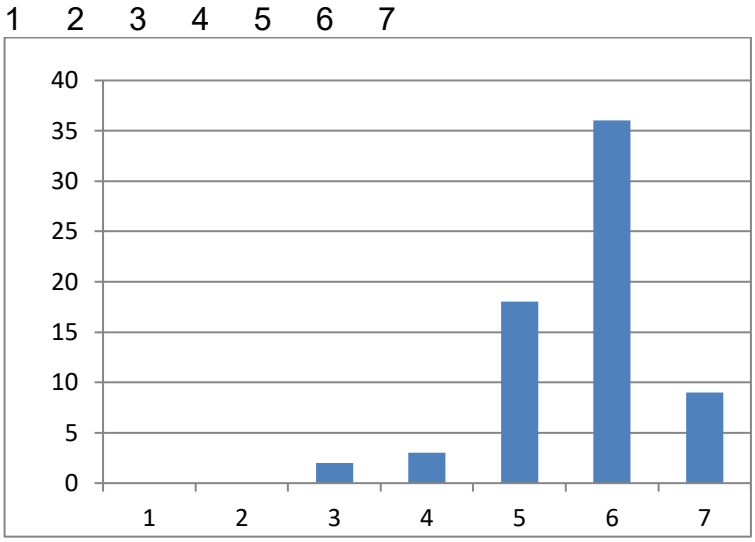

Fig 4.31 Q13 Response

Mean	5.7
Std dev	0.9
Min	3
Max	7

User satisfaction was at a very good level (near excellent).

Q14 Prompt to users from query/request to response

1 2 3 4 5 6 7

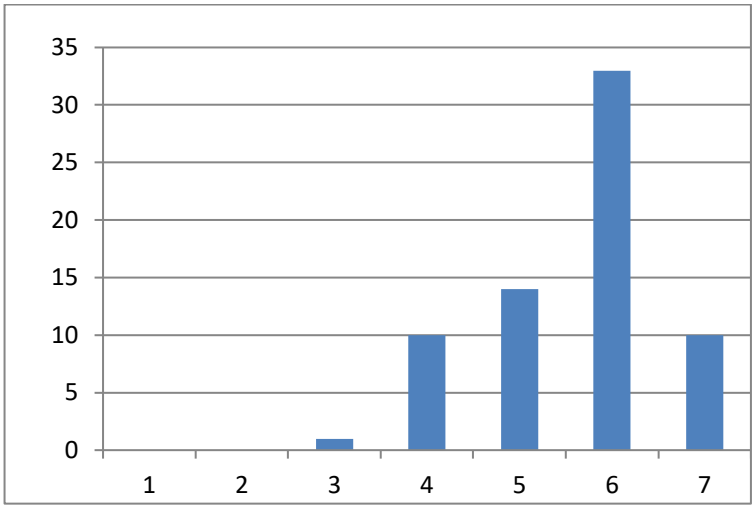

Fig 4.32 Q14 Response

Mean	5.6
Std dev	1.0
Min	3
Max	7

User satisfaction was at a very good level.

Q15 User friendly in attitude

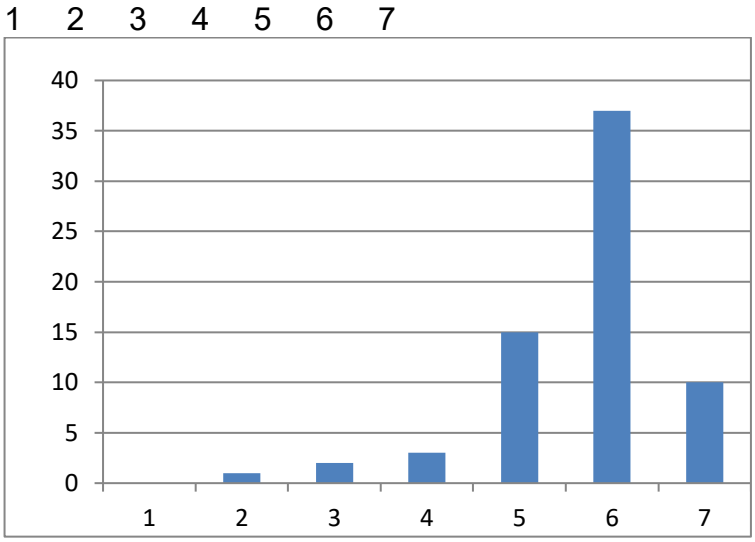

Fig 4.33 Q15 Response

Mean	5.7
Std dev	1.0
Min	2
Max	7

User satisfaction was at a very good level (near excellent).

Q16 Oriented to understand the user's needs

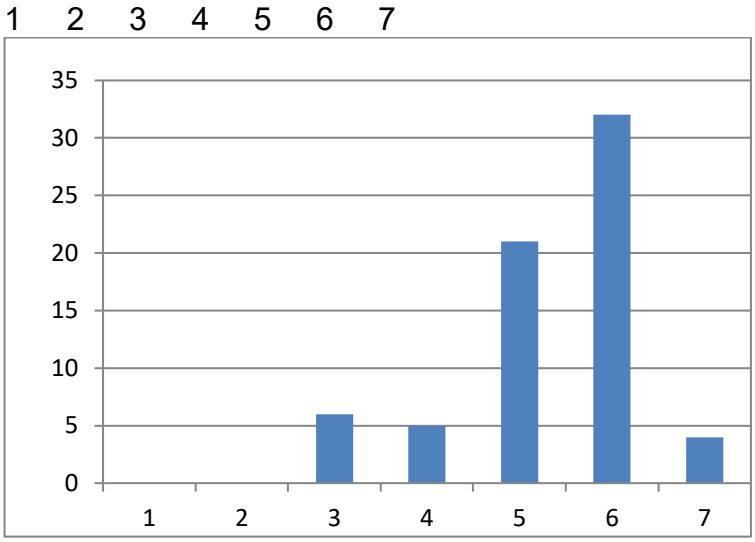

Fig 4.34 Q16 Response

Mean	5.3
Std dev	1.0
Min	3
Max	7

User satisfaction was at a very good level.

Q17 Delivered by knowledgeable staff

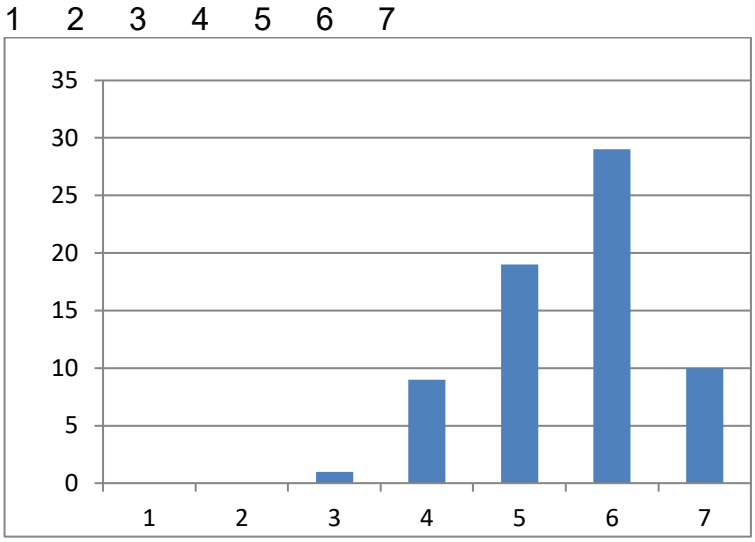

Fig 4.35 Q17 Response

Mean	5.6
Std dev	1.0
Min	3
Max	7

User satisfaction was at a very good level.

Q18 Augmented by self-help documentation and systems

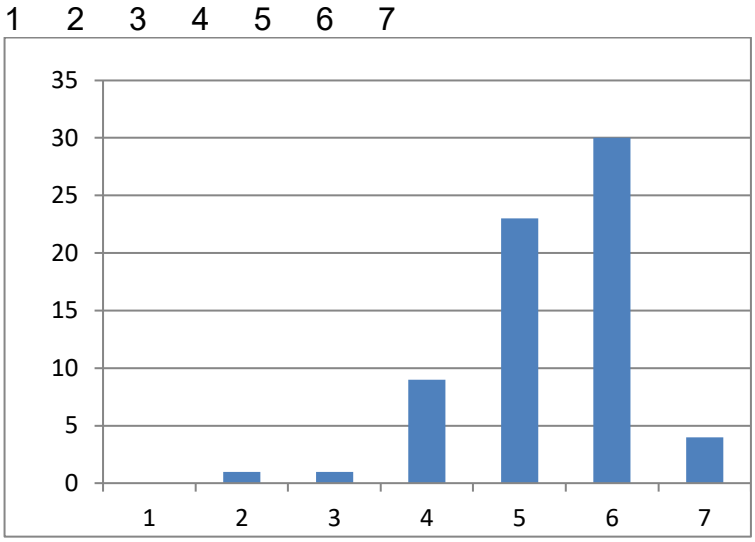

Fig 4.36 Q18 Response

Mean	5.4
Std dev	0.9
Min	2
Max	7

User satisfaction was at a very good level.

Q19

User

I am confident when using websites

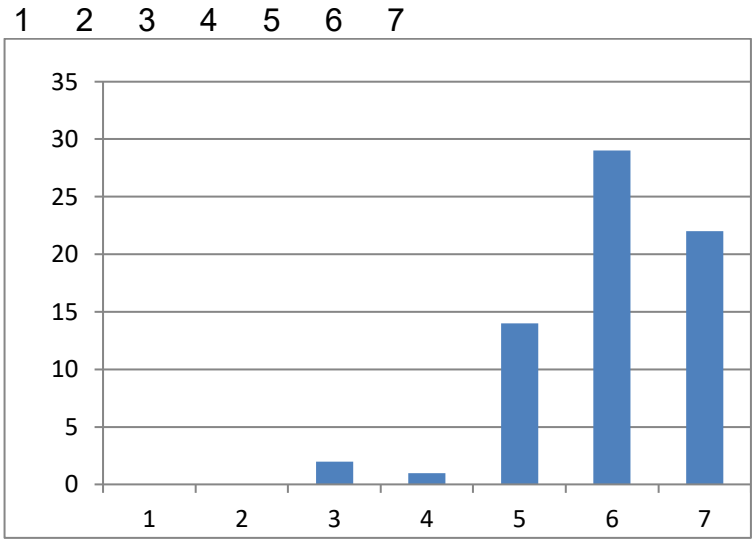

Fig 4.37 Q19 Response

Mean	6.0
Std dev	0.9
Min	3
Max	7

User agreement was at an excellent level.

Q20

User

My age is:

1 = 18 - 24
2 = 25 - 34
3 = 35 - 44
4 = 45 - 54
5 = 55 - 64
6 = 65 or older

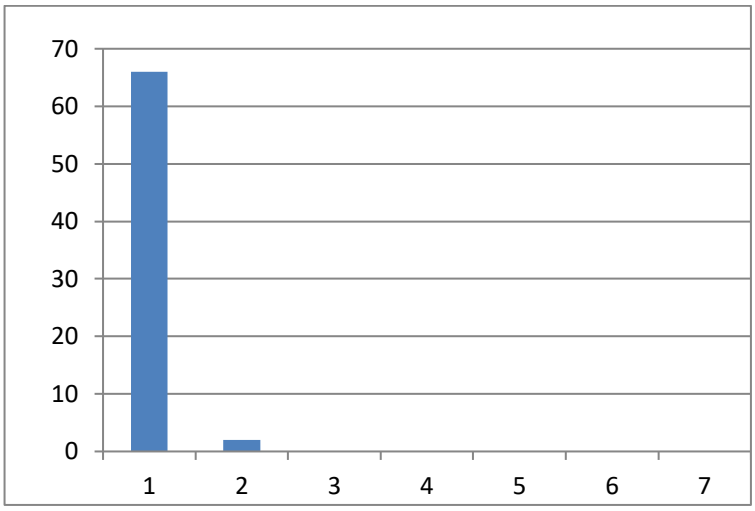

Fig 4.38 Q20 Response

Q21

User

I am:

1 = Male
2 = Female

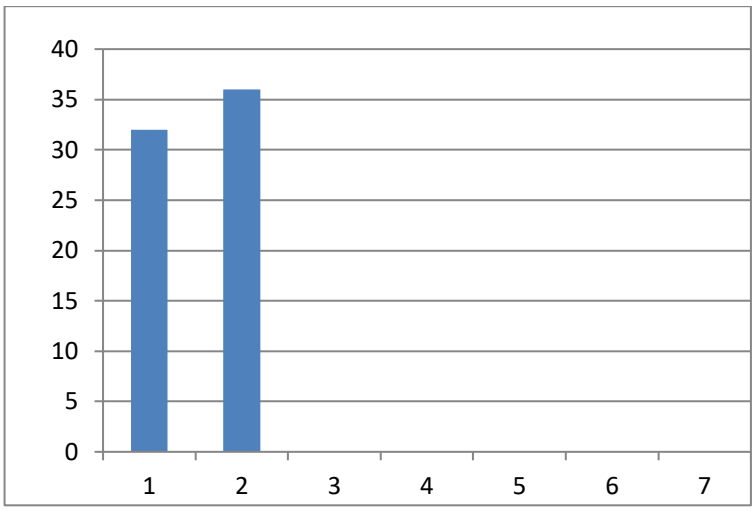

Fig 4.39 Q21 Response

Q22

User

I am competent when using websites

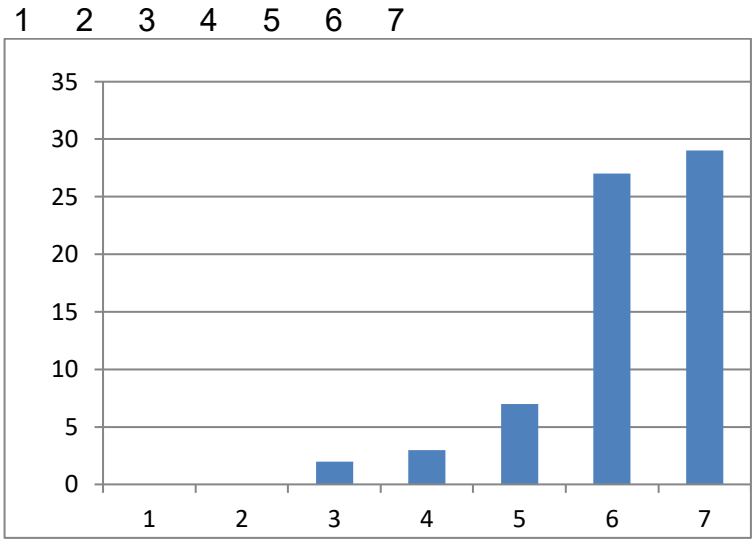

Fig 4.40 Q22 Response

Mean	6.1
Std dev	1.0
Min	3
Max	7

User agreement was at an excellent level.

In summary, the overall Mean for Eval (score variable) = 80.2% (equivalent to 80.2x7/100 = 5.6 out of 7). Standard deviation: 9.1%
The mean level of IT User satisfaction as measured by the variable Eval is very good according to our classification system.
In terms of the breakdown of the components of quality, System Quality was perceived to be very good on the whole, Information Quality was nearly excellent and Service Quality too was nearly excellent. Users felt strongly that they were both confident and competent at using websites.

4.5 Correlation matrices

4.5.1 Correlation matrix 1

Table 4.5.1 Correlation matrix Website Evaluation Scale items and NFC score, Eval score

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	NFC	Eval
Q1	r	1.00	.602**	.618**	.399**	0.13	0.19	0.14	.256*	0.09	.398**	.510**	.336**	.410**	.291*	.407**	.311**	0.16	0.02	.350**	0.13	-0.08	0.14	0.02	.598**
	Sig. (2-tailed)		0.00	0.00	0.00	0.31	0.12	0.26	0.03	0.48	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.18	0.88	0.00	0.31	0.54	0.25	0.87	0.00
Q2	r	.602**	1.00	.378**	.330**	0.15	.400**	0.18	.394**	.245*	0.23	.380**	.481**	.430**	0.21	.470**	.262*	.305*	0.07	.270*	0.13	-0.04	0.19	0.10	.599**
	Sig. (2-t	0.00		0.00	0.01	0.22	0.00	0.13	0.00	0.04	0.06	0.00	0.00	0.00	0.08	0.00	0.03	0.01	0.55	0.03	0.28	0.73	0.12	0.40	0.00
Q3	r	.618**	.378**	1.00	.435**	.312**	.250*	0.22	0.22	.363**	.602**	.695**	.385**	.489**	.517**	.574**	.424**	0.16	0.15	.394**	0.13	-0.11	0.16	0.01	.719**
	Sig. (2-t	0.00	0.00		0.00	0.01	0.04	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.21	0.00	0.30	0.38	0.19	0.97	0.00
Q4	r	.399**	.330**	.435**	1.00	.287*	.365**	.366**	.346**	0.15	.360**	.240*	.323**	.378**	.271*	.432**	.420**	0.23	.286*	0.15	0.18	-0.07	0.07	0.07	.607**
	Sig. (2-t	0.00	0.01	0.00		0.02	0.00	0.00	0.00	0.21	0.00	0.05	0.01	0.00	0.03	0.00	0.00	0.06	0.02	0.21	0.14	0.57	0.57	0.60	0.00
Q5	r	0.13	0.15	.312**	.287*	1.00	.533**	.535**	.256*	.503**	0.09	.270*	.404**	.364**	.408**	.336**	0.15	.335**	0.21	0.21	0.10	-.250*	0.23	0.14	.535**
	Sig. (2-t	0.31	0.22	0.01	0.02		0.00	0.00	0.03	0.00	0.47	0.03	0.00	0.00	0.00	0.01	0.21	0.01	0.08	0.08	0.42	0.04	0.06	0.26	0.00
Q6	r	0.19	.400**	.250*	.365**	.533**	1.00	.618**	.429**	.424**	0.14	0.22	.610**	.470**	.300*	.416**	.268*	.492**	0.19	0.10	0.11	-0.15	0.14	.280*	.624**
	Sig. (2-t	0.12	0.00	0.04	0.00	0.00		0.00	0.00	0.00	0.26	0.07	0.00	0.00	0.01	0.00	0.03	0.00	0.11	0.42	0.36	0.24	0.24	0.02	0.00
Q7	r	0.14	0.18	0.22	.366**	.535**	.618**	1.00	.514**	.428**	0.18	.280*	.383**	.261*	.271*	.295*	0.23	.535**	.388**	0.20	0.01	-0.16	0.18	.297*	.571**
	Sig. (2-t	0.26	0.13	0.07	0.00	0.00	0.00		0.00	0.00	0.15	0.02	0.00	0.03	0.03	0.01	0.05	0.00	0.00	0.10	0.91	0.19	0.13	0.01	0.00
Q8	r	.256*	.394**	0.22	.346**	.256*	.429**	.514**	1.00	.490**	.316**	.284*	.581**	.370**	0.21	.487**	.276*	.458**	0.17	.356**	0.05	-0.12	.295*	0.10	.603**
	Sig. (2-t	0.03	0.00	0.08	0.00	0.03	0.00	0.00		0.00	0.01	0.02	0.00	0.00	0.08	0.00	0.02	0.00	0.16	0.00	0.66	0.33	0.01	0.41	0.00
Q9	r	0.09	.245*	.363**	0.15	.503**	.424**	.428**	.490**	1.00	.379**	.353**	.448**	.448**	.412**	.451**	.347**	.291*	.322**	.269*	0.05	-.249*	0.23	0.05	.604**
	Sig. (2-t	0.48	0.04	0.00	0.21	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.67	0.04	0.06	0.69	0.00
Q10	r	.398**	0.23	.602**	.360**	0.09	0.14	0.18	.316**	.379**	1.00	.645**	.319**	.483**	.371**	.549**	.501**	0.18	0.23	0.21	0.05	-0.22	-0.02	0.01	.638**
	Sig. (2-t	0.00	0.06	0.00	0.00	0.47	0.26	0.15	0.01	0.00		0.00	0.01	0.00	0.00	0.00	0.00	0.14	0.05	0.09	0.69	0.07	0.88	0.96	0.00
Q11	r	.510**	.380**	.695**	.240*	.270*	0.22	.280*	.284*	.353**	.645**	1.00	.525**	.532**	.548**	.708**	.408**	.328**	0.08	.417**	0.05	-0.20	0.08	0.07	.720**
	Sig. (2-t	0.00	0.00	0.00	0.05	0.03	0.07	0.02	0.02	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.01	0.50	0.00	0.66	0.11	0.53	0.60	0.00
Q12	r	.336**	.481**	.385**	.323**	.404**	.610**	.383**	.581**	.448**	.319**	.525**	1.00	.577**	.475**	.658**	.323**	.517**	0.13	.328**	-0.04	-0.19	0.23	0.13	.736**
	Sig. (2-t	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00		0.00	0.00	0.00	0.01	0.00	0.29	0.01	0.74	0.12	0.06	0.28	0.00
Q13	r	.410**	.430**	.489**	.378**	.364**	.470**	.261*	.370**	.448**	.483**	.532**	.577**	1.00	.475**	.657**	.425**	.338**	0.17	0.20	0.06	-0.24	0.02	0.06	.731**
	Sig. (2-t	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.16	0.10	0.61	0.05	0.88	0.63	0.00
Q14	r	.291*	0.21	.517**	.271*	.408**	.300*	.271*	0.21	.412**	.371**	.548**	.475**	.475**	1.00	.594**	0.20	.327**	0.19	0.20	-0.02	-0.18	.268*	0.22	.622**
	Sig. (2-t	0.02	0.08	0.00	0.03	0.00	0.01	0.03	0.08	0.00	0.00	0.00	0.00	0.00		0.00	0.10	0.01	0.12	0.10	0.88	0.15	0.03	0.07	0.00
Q15	r	.407**	.470**	.574**	.432**	.336**	.416**	.295*	.487**	.451**	.549**	.708**	.658**	.657**	.594**	1.00	.436**	.443**	0.22	.311**	0.14	-0.18	0.17	0.00	.809**
	Sig. (2-t	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.08	0.01	0.24	0.15	0.16	0.99	0.00
Q16	r	.311**	.262*	.424**	.420**	0.15	.268*	0.23	.276*	.347**	.501**	.408**	.323**	.425**	0.20	.436**	1.00	.357**	.310*	0.22	-0.06	-0.15	0.10	0.11	.597**
	Sig. (2-t	0.01	0.03	0.00	0.00	0.21	0.03	0.05	0.02	0.00	0.00	0.00	0.01	0.00	0.10	0.00		0.00	0.01	0.07	0.64	0.22	0.42	0.36	0.00
Q17	r	0.16	.305*	0.16	0.23	.335**	.492**	.535**	.458**	.291*	0.18	.328**	.517**	.338**	.327**	.443**	.357**	1.00	.392**	.253*	-.287*	-0.10	.278*	.242*	.582**
	Sig. (2-t	0.18	0.01	0.18	0.06	0.01	0.00	0.00	0.00	0.02	0.14	0.01	0.00	0.00	0.01	0.00	0.00		0.00	0.04	0.02	0.43	0.02	0.05	0.00
Q18	r	0.02	0.07	0.15	.286*	0.21	0.19	.388**	0.17	.322**	0.23	0.08	0.13	0.17	0.19	0.22	.310*	.392**	1.00	0.14	-.252*	-0.18	0.12	0.11	.386**
	Sig. (2-t	0.88	0.55	0.21	0.02	0.08	0.11	0.00	0.16	0.01	0.05	0.50	0.29	0.16	0.12	0.08	0.01	0.00		0.27	0.04	0.14	0.33	0.36	0.00
Q19	r	.350**	.270*	.394**	0.15	0.21	0.10	0.20	.356**	.269*	0.21	.417**	.328**	0.20	0.20	.311**	0.22	.253*	0.14	1.00	0.09	-0.16	.572**	0.05	.409**
	Sig. (2-t	0.00	0.03	0.00	0.21	0.08	0.42	0.10	0.00	0.03	0.09	0.00	0.01	0.10	0.10	0.01	0.07	0.04	0.27		0.44	0.19	0.00	0.71	0.00
Q20	r	0.13	0.13	0.13	0.18	0.10	0.11	0.01	0.05	0.05	0.05	0.05	-0.04	0.06	-0.02	0.14	-0.06	-.287*	-.252*	0.09	1.00	-0.01	0.06	-0.10	0.06
	Sig. (2-t	0.31	0.28	0.30	0.14	0.42	0.36	0.91	0.66	0.67	0.69	0.66	0.74	0.61	0.88	0.24	0.64	0.02	0.04	0.44		0.93	0.61	0.44	0.62
Q21	r	-0.08	-0.04	-0.11	-0.07	-.250*	-0.15	-0.16	-0.12	-.249*	-0.22	-0.20	-0.19	-0.24	-0.18	-0.18	-0.15	-0.10	-0.18	-0.16	-0.01	1.00	-0.10	-0.02	-.245*
	Sig. (2-t	0.54	0.73	0.38	0.57	0.04	0.24	0.19	0.33	0.04	0.07	0.11	0.12	0.05	0.15	0.15	0.22	0.43	0.14	0.19	0.93		0.42	0.90	0.04
Q22	r	0.14	0.19	0.16	0.07	0.23	0.14	0.18	.295*	0.23	-0.02	0.08	0.23	0.02	.268*	0.17	0.10	.278*	0.12	.572**	0.06	-0.10	1.00	.297*	.248*
	Sig. (2-t	0.25	0.12	0.19	0.57	0.06	0.24	0.13	0.01	0.06	0.88	0.53	0.06	0.88	0.03	0.16	0.42	0.02	0.33	0.00	0.61	0.42		0.01	0.04
NFC	r	0.02	0.10	0.01	0.07	0.14	.280*	.297*	0.10	0.05	0.01	0.07	0.13	0.06	0.22	0.00	0.11	.242*	0.11	0.05	-0.10	-0.02	.297*	1.00	0.17
	Sig. (2-t	0.87	0.40	0.97	0.60	0.26	0.02	0.01	0.41	0.69	0.96	0.60	0.28	0.63	0.07	0.99	0.36	0.05	0.36	0.71	0.44	0.90	0.01		0.18
Eval	r	.598**	.599**	.719**	.607**	.535**	.624**	.571**	.603**	.604**	.638**	.720**	.736**	.731**	.622**	.809**	.597**	.582**	.386**	.409**	0.06	-.245*	.248*	0.17	1.00
	Sig. (2-t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.04	0.04	0.18	

4.5.2 Correlation matrix 2

Table 4.5.2 Correlation matrix NFC Scale items and NFC score, Eval score

		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	NFC	Eval
B1	r	1.00	.468**	.296*	.287*	.318**	.377**	0.04	-0.02	0.01	.254*	.299*	0.19	0.24	0.09	0.16	.312**	0.14	0.15	.496**	.248*
	Sig. (2-tailed)		0.00	0.01	0.02	0.01	0.00	0.72	0.89	0.94	0.04	0.01	0.12	0.05	0.47	0.19	0.01	0.25	0.21	0.00	0.04
B2	r	.468*	1.00	.606**	.430**	.338**	.417**	0.01	0.14	-0.05	.239*	.463**	0.12	.360*	.353**	0.23	.306*	.267*	.272*	.496**	.271*
	Sig. (2-tailed)	0.00		0.00	0.00	0.00	0.00	0.91	0.26	0.66	0.05	0.00	0.33	0.00	0.00	0.06	0.01	0.03	0.02	0.00	0.03
B3	r	.296*	.606**	1.00	.353**	.412**	.496**	0.00	0.06	-0.11	0.05	.517**	0.16	.376*	0.21	0.12	.406**	0.23	0.19	.534**	0.18
	Sig. (2-tailed)	0.01	0.00		0.00	0.00	0.00	0.97	0.63	0.38	0.69	0.00	0.20	0.00	0.09	0.32	0.00	0.06	0.11	0.00	0.15
B4	r	.287*	.430**	.353**	1.00	.444**	.373**	0.20	0.13	0.01	0.18	.313**	0.23	.287*	0.18	.341**	.293*	.461**	0.23	.570**	0.00
	Sig. (2-tailed)	0.02	0.00	0.00		0.00	0.00	0.11	0.30	0.96	0.15	0.01	0.06	0.02	0.14	0.00	0.02	0.00	0.06	0.00	0.99
B5	r	.318*	.338**	.412**	.444**	1.00	0.22	.260*	0.22	0.12	0.01	.351**	0.16	.263*	0.18	0.10	.504**	.273*	0.04	.657**	0.00
	Sig. (2-tailed)	0.01	0.00	0.00	0.00		0.07	0.03	0.08	0.32	0.92	0.00	0.21	0.03	0.15	0.41	0.00	0.02	0.78	0.00	0.97
B6	r	.377*	.417**	.496**	.373**	0.22	1.00	-0.03	-0.06	-0.03	0.19	.434**	.256*	0.19	0.10	0.12	0.15	.339**	.289*	.510**	0.01
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.07		0.83	0.65	0.82	0.12	0.00	0.03	0.12	0.41	0.34	0.24	0.00	0.02	0.00	0.91
B7	r	0.04	0.01	0.00	0.20	.260*	-0.03	1.00	0.15	0.17	-0.12	0.09	0.11	0.17	.247*	0.18	0.15	.333**	.296*	.371**	-0.11
	Sig. (2-tailed)	0.72	0.91	0.97	0.11	0.03	0.83		0.21	0.15	0.32	0.46	0.39	0.17	0.04	0.15	0.23	0.01	0.01	0.00	0.37
B8	r	-0.02	0.14	0.06	0.13	0.22	-0.06	0.15	1.00	.561**	-0.20	-0.06	-0.07	-0.02	0.16	-0.05	0.08	-0.04	0.15	0.07	0.06
	Sig. (2-tailed)	0.89	0.26	0.63	0.30	0.08	0.65	0.21		0.00	0.11	0.66	0.58	0.87	0.20	0.70	0.51	0.77	0.22	0.59	0.65
B9	r	0.01	-0.05	-0.11	0.01	0.12	-0.03	0.17	.561**	1.00	0.01	-0.14	0.19	-0.17	0.12	0.14	0.16	0.03	-0.04	0.24	0.12
	Sig. (2-tailed)	0.94	0.66	0.38	0.96	0.32	0.82	0.15	0.00		0.95	0.26	0.11	0.17	0.31	0.25	0.20	0.83	0.73	0.05	0.33
B10	r	.254*	.239*	0.05	0.18	0.01	0.19	-0.12	-0.20	0.01	1.00	.244*	0.20	-0.06	0.18	0.15	-0.15	0.05	0.11	0.02	0.19
	Sig. (2-tailed)	0.04	0.05	0.69	0.15	0.92	0.12	0.32	0.11	0.95		0.04	0.11	0.60	0.15	0.22	0.21	0.69	0.35	0.85	0.12
B11	r	.299*	.463**	.517**	.313**	.351**	.434**	0.09	-0.06	-0.14	.244*	1.00	.266*	.268*	.492**	0.13	0.19	.391**	0.21	.396**	-0.03
	Sig. (2-tailed)	0.01	0.00	0.00	0.01	0.00	0.00	0.46	0.66	0.26	0.04		0.03	0.03	0.00	0.28	0.13	0.00	0.09	0.00	0.82
B12	r	0.19	0.12	0.16	0.23	0.16	.256*	0.11	-0.07	0.19	0.20	.266*	1.00	0.10	0.03	0.20	0.02	0.20	0.14	.356**	0.00
	Sig. (2-tailed)	0.12	0.33	0.20	0.06	0.21	0.03	0.39	0.58	0.11	0.11	0.03		0.43	0.78	0.11	0.89	0.11	0.25	0.00	0.99
B13	r	0.24	.360**	.376**	.287*	.263*	0.19	0.17	-0.02	-0.17	-0.06	.268*	0.10	1.00	.239*	0.09	0.16	.269*	0.23	0.20	0.03
	Sig. (2-tailed)	0.05	0.00	0.00	0.02	0.03	0.12	0.17	0.87	0.17	0.60	0.03	0.43		0.05	0.49	0.20	0.03	0.06	0.11	0.79
B14	r	0.09	.353**	0.21	0.18	0.18	0.10	.247*	0.16	0.12	0.18	.492**	0.03	.239*	1.00	0.08	.320**	0.17	.406**	.292*	0.04
	Sig. (2-tailed)	0.47	0.00	0.09	0.14	0.15	0.41	0.04	0.20	0.31	0.15	0.00	0.78	0.05		0.50	0.01	0.16	0.00	0.02	0.76
B15	r	0.16	0.23	0.12	.341**	0.10	0.12	0.18	-0.05	0.14	0.15	0.13	0.20	0.09	0.08	1.00	-0.01	0.06	.239*	0.04	-0.08
	Sig. (2-tailed)	0.19	0.06	0.32	0.00	0.41	0.34	0.15	0.70	0.25	0.22	0.28	0.11	0.49	0.50		0.91	0.61	0.05	0.72	0.54
B16	r	.312*	.306*	.406**	.293*	.504**	0.15	0.15	0.08	0.16	-0.15	0.19	0.02	0.16	.320**	-0.01	1.00	.257*	0.04	.702**	0.18
	Sig. (2-tailed)	0.01	0.01	0.00	0.02	0.00	0.24	0.23	0.51	0.20	0.21	0.13	0.89	0.20	0.01	0.91		0.03	0.76	0.00	0.15
B17	r	0.14	.267*	0.23	.461**	.273*	.339**	.333**	-0.04	0.03	0.05	.391**	0.20	.269*	0.17	0.06	.257*	1.00	.242*	.577**	0.04
	Sig. (2-tailed)	0.25	0.03	0.06	0.00	0.02	0.00	0.01	0.77	0.83	0.69	0.00	0.11	0.03	0.16	0.61	0.03		0.05	0.00	0.72
B18	r	0.15	.272*	0.19	0.23	0.04	.289*	.296*	0.15	-0.04	0.11	0.21	0.14	0.23	.406**	.239*	0.04	.242*	1.00	0.07	-0.06
	Sig. (2-tailed)	0.21	0.02	0.11	0.06	0.78	0.02	0.01	0.22	0.73	0.35	0.09	0.25	0.06	0.00	0.05	0.76	0.05		0.56	0.65
NFC	r	.496*	.496**	.534**	.570**	.657**	.510**	.371**	0.07	0.24	0.02	.396**	.356**	0.20	.292*	0.04	.702**	.577**	0.07	1.00	0.17
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.05	0.85	0.00	0.00	0.11	0.02	0.72	0.00	0.00	0.56		0.18
Eval	r	.248*	.271*	0.18	0.00	0.00	0.01	-0.11	0.06	0.12	0.19	-0.03	0.00	0.03	0.04	-0.08	0.18	0.04	-0.06	0.17	1.00
	Sig. (2-tailed)	0.04	0.03	0.15	0.99	0.97	0.91	0.37	0.65	0.33	0.12	0.82	0.99	0.79	0.76	0.54	0.15	0.72	0.65	0.18	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.6 Reliability of NFC Scale

IBM SPSS 25 was used to find the internal reliability of the NFC Scale (using commands on the menu: Analyse/Scale/Reliability Analysis)
All 18 item responses (B1 to B18) were entered and the results were as follows:

Table 4.6 Cronbach Alpha for NFC Scale items

Scale: NFC Scale

Case Processing Summary

		N	%
Cases	Valid	68	100.0
	Excluded[a]	0	.0
	Total	68	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.803	18

This shows high internal reliability (0.8 and above are considered high correlations see Cronbach, 1962;1988) for the scale and indicates that the scale items are measuring the same construct.

4.7 Reliability of IT User Satisfaction Scale

IBM SPSS 25 was used also to find the internal reliability of the IT User Satisfaction Scale (using commands on the menu: Analyse/Scale/Reliability Analysis)
All 18 item responses (A1 to A18) were entered with following results:

Table 4.7 Cronbach Alpha for IT User Satisfaction Scale items

Scale: IT User Satisfaction Scale

Case Processing Summary

		N	%
Cases	Valid	68	100.0
	Excluded[a]	0	.0
	Total	68	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.905	18

This shows very high internal reliability (0.905) for the scale and indicates that the scale items are measuring the same construct. This is on the verge of being too high as correlations of over 0.95 show that some items on the scale could actually be redundant and add no value.

4.8 Correlation analyses

4.8.1 Correlations between NFC Scale Items and IT User Satisfaction Scale Items

IBM SPSS 25 was used to find the Pearson Correlation Coefficient between **NFC Score** and **IT User Satisfaction Score** (using commands on the menu: Analyse/Correlate/Bivariate).
(see Table 4.5.1 and Table 4.5.2)
Correlations were found as follows:

4.8.2 NFC Scale Item Correlations

Not all 18 items (B1 to B18) are significantly correlated to the **NFC Score**.
B1, B2, B3, B4, B5, B6, B11, B12, B16, B17 are significant at the 0.01 level (2-tailed).
B14 is significant at the 0.05 level (2-tailed).
B8, B9, B10, B13, B15, B18 are not significant at the 0.05 level (2-tailed).
These correlations are important for internal consistency checks. Even though the Cronbach Alpha is high (0.803) the information above should also be noted as observed inconsistencies in the scale.

4.8.3 IT User Satisfaction Scale Item Correlations

All 18 items (Q1 to Q18 are significantly correlated to the **IT User Satisfaction Score**. All are significant at the 0.01 level (2-tailed).
As noted above, these correlations are important for internal consistency checks. With the Cronbach Alpha being very high (0.905) the information above is further reassurance of a reliable scale.

4.8.4 NFC Scale Items and IT User Satisfaction Scale Items Correlations

NFC Score has a small correlation (0.17) with **IT User Satisfaction Score** but this is not significant at 0.01 or 0.05 level (2-tailed).

4.8.5 NFC Score and IT User Satisfaction Scale Q19 (I am confident when using websites) **correlation**

Table 4.8.5 NFC Score and IT User Satisfaction Scale Q19 correlation

Correlations

		User I am confident when using websites	NFC
User	Pearson Correlation	1	.046
	Sig. (2-tailed)		.711
I am confident when using websites	N	68	68
NFC	Pearson Correlation	.046	1
	Sig. (2-tailed)	.711	
	N	68	68

NFC Score has a very small correlation (0.046) with **Q19** but this is not significant at 0.01 or 0.05 level (2-tailed).

4.8.6 NFC Score and IT User Satisfaction Scale Q22 (I am competent when using websites) **correlation**

Table 4.8.6 NFC Score and IT User Satisfaction Scale Q22 correlation

Correlations

		NFC	User I am competent when using websites
NFC	Pearson Correlation	1	.297*
	Sig. (2-tailed)		.014
	N	68	68
User	Pearson Correlation	.297*	1
	Sig. (2-tailed)	.014	
I am competent when using websites	N	68	68

*. Correlation is significant at the 0.05 level (2-tailed).

NFC Score has a small correlation (0.297) with **Q22** and this is significant at 0.05 level (2-tailed).

4.8.7 IT User Satisfaction Score and IT User Satisfaction Scale Q19 **correlation**

Table 4.8.7 NFC Score and IT User Satisfaction Scale Q19 correlation

Correlations

		Eval	User I am confident when using websites
Eval	Pearson Correlation	1	.409**
	Sig. (2-tailed)		.001
	N	68	68
User I am confident when using websites	Pearson Correlation	.409**	1
	Sig. (2-tailed)	.001	
	N	68	68

**. Correlation is significant at the 0.01 level (2-tailed).

IT User Satisfaction Score has a moderate correlation (0.409) with **Q19** and this is significant at 0.01 (2-tailed).

4.8.8 IT User Satisfaction Score and IT User Satisfaction Scale Q22 **correlation**

Table 4.8.8 NFC Score and IT User Satisfaction Scale Q22 correlation

Correlations

		Eval	User I am competent when using websites
Eval	Pearson Correlation	1	.248*
	Sig. (2-tailed)		.042
	N	68	68
User I am competent when using websites	Pearson Correlation	.248*	1
	Sig. (2-tailed)	.042	
	N	68	68

*. Correlation is significant at the 0.05 level (2-tailed).

IT User Satisfaction Score has a small correlation (0.248) with **Q22** and this is significant at 0.05 (2-tailed).

4.9 ANOVA Test of differences between means

IBM SPSS 25 was used to find compare means for NFC items and IT User Satisfaction items using commands on the menu: Analyse/ Compare Means/Independent Samples T-test.

4.9.1 ANOVA Test of Differences in Means: NFC items by Q21 Gender **(No significant differences)**

Table 4.9.1 ANOVA Test of Differences in Means NFC items by Q21 Gender

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
B1	Equal variances assumed	.100	.753	1.475	66	.145	.51389	.34851	-.18193	1.20971
	Equal variances not assumed			1.467	63.385	.147	.51389	.35026	-.18597	1.21375
B2	Equal variances assumed	9.271	.003	1.745	66	.086	.48264	.27657	-.06955	1.03482
	Equal variances not assumed			1.687	45.632	.098	.48264	.28611	-.09340	1.05868
B3	Equal variances assumed	9.786	.003	-.770	66	.444	-.25347	.32922	-.91079	.40384
	Equal variances not assumed			-.747	47.760	.459	-.25347	.33950	-.93617	.42922
B4	Equal variances assumed	.649	.423	.339	66	.736	.12153	.35849	-.59421	.83727
	Equal variances not assumed			.336	62.222	.738	.12153	.36123	-.60052	.84357
B5	Equal variances assumed	.260	.612	.239	66	.812	.09028	.37840	-.66522	.84577
	Equal variances not assumed			.238	63.697	.813	.09028	.38000	-.66893	.84949
B6	Equal variances assumed	3.557	.064	-.532	66	.597	-.19444	.36583	-.92485	.53596
	Equal variances not assumed			-.524	58.784	.602	-.19444	.37098	-.93684	.54795
B7	Equal variances assumed	1.444	.234	-1.235	66	.221	-.49653	.40200	-1.29914	.30609
	Equal variances not assumed			-1.227	62.530	.225	-.49653	.40482	-1.30561	.31255
B8	Equal variances assumed	.017	.898	-.867	66	.389	-.32639	.37642	-1.07794	.42516
	Equal variances not assumed			-.864	63.743	.391	-.32639	.37797	-1.08154	.42876
B9	Equal variances assumed	.662	.419	.089	66	.930	.03125	.35255	-.67263	.73513
	Equal variances not assumed			.088	62.707	.930	.03125	.35488	-.67798	.74048
B10	Equal variances assumed	.005	.943	1.440	66	.155	.32639	.22664	-.12610	.77888
	Equal variances not assumed			1.450	65.993	.152	.32639	.22516	-.12317	.77594
B11	Equal variances assumed	.328	.569	.367	66	.715	.11111	.30286	-.49356	.71578
	Equal variances not assumed			.363	60.301	.718	.11111	.30632	-.50155	.72377
B12	Equal variances assumed	.357	.552	-.994	66	.324	-.29167	.29340	-.87745	.29412
	Equal variances not assumed			-.986	62.158	.328	-.29167	.29569	-.88271	.29937
B13	Equal variances assumed	.973	.328	.913	66	.365	.30903	.33860	-.36701	.98506
	Equal variances not assumed			.904	61.532	.369	.30903	.34167	-.37407	.99213
B14	Equal variances assumed	.374	.543	.842	66	.403	.26042	.30930	-.35713	.87796
	Equal variances not assumed			.842	65.075	.403	.26042	.30930	-.35727	.87811
B15	Equal variances assumed	.167	.684	1.028	66	.308	.35417	.34440	-.33346	1.04179
	Equal variances not assumed			1.027	64.669	.308	.35417	.34490	-.33471	1.04304
B16	Equal variances assumed	3.068	.085	.930	66	.356	.34722	.37319	-.39788	1.09232
	Equal variances not assumed			.940	65.766	.350	.34722	.36925	-.39006	1.08451
B17	Equal variances assumed	1.108	.296	-.358	66	.722	-.14583	.40772	-.95988	.66821
	Equal variances not assumed			-.355	62.333	.724	-.14583	.41076	-.96683	.67517
B18	Equal variances assumed	.769	.384	-1.611	66	.112	-.54514	.33838	-1.22073	.13046
	Equal variances not assumed			-1.600	62.497	.115	-.54514	.34077	-1.22623	.13595
NFC	Equal variances assumed	5.761	.019	.131	66	.896	.18739	1.43238	-2.67245	3.04723
	Equal variances not assumed			.128	52.955	.899	.18739	1.46579	-2.75267	3.12744

4.9.2 ANOVA Test of Differences in Means: NFC items by programme **(2 items with significant differences)**

Table 4.9.1 ANOVA Test of Differences in Means NFC items by programme

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
B1	Equal variances assumed	.000	.998	-.123	66	.903	-.04426	.36129	-.76560	.67708
	Equal variances not assumed			-.123	56.354	.903	-.04426	.36021	-.76576	.67723
B2	Equal variances assumed	.123	.726	.081	66	.935	.02349	.28855	-.55263	.59960
	Equal variances not assumed			.085	63.688	.932	.02349	.27498	-.52589	.57287
B3	Equal variances assumed	2.117	.150	-.222	66	.825	-.07498	.33723	-.74827	.59832
	Equal variances not assumed			-.237	65.231	.813	-.07498	.31638	-.70678	.55683
B4	Equal variances assumed	.009	.925	.133	66	.894	.04878	.36597	-.68190	.77946
	Equal variances not assumed			.134	56.188	.894	.04878	.36520	-.68275	.78031
B5	Equal variances assumed	.094	.760	.904	66	.369	.34688	.38381	-.41942	1.11319
	Equal variances not assumed			.924	59.741	.359	.34688	.37557	-.40443	1.09819
B6	Equal variances assumed	.083	.774	.128	66	.899	.04788	.37394	-.69872	.79448
	Equal variances not assumed			.129	56.527	.898	.04788	.37249	-.69815	.79390
B7	Equal variances assumed	1.136	.290	.176	66	.860	.07317	.41470	-.75481	.90115
	Equal variances not assumed			.178	57.928	.859	.07317	.40997	-.74749	.89383
B8	Equal variances assumed	.211	.647	-.742	66	.461	-.28546	.38458	-1.05329	.48238
	Equal variances not assumed			-.747	56.875	.458	-.28546	.38236	-1.05116	.48025
B9	Equal variances assumed	.061	.805	.754	66	.453	.27010	.35812	-.44491	.98511
	Equal variances not assumed			.752	55.117	.456	.27010	.35940	-.45011	.99031
B10	Equal variances assumed	.458	.501	2.809	66	.007	.62331	.22191	.18025	1.06637
	Equal variances not assumed			2.724	49.935	.009	.62331	.22882	.16369	1.08292
B11	Equal variances assumed	1.155	.286	2.249	66	.028	.67028	.29806	.07519	1.26537
	Equal variances not assumed			2.196	51.202	.033	.67028	.30530	.05743	1.28313
B12	Equal variances assumed	2.156	.147	-.297	66	.768	-.08943	.30133	-.69106	.51220
	Equal variances not assumed			-.312	63.802	.756	-.08943	.28688	-.66258	.48372
B13	Equal variances assumed	3.114	.082	-.544	66	.588	-.18880	.34681	-.88122	.50362
	Equal variances not assumed			-.564	61.990	.575	-.18880	.33465	-.85776	.48016
B14	Equal variances assumed	.245	.623	.790	66	.433	.24932	.31573	-.38105	.87970
	Equal variances not assumed			.795	56.970	.430	.24932	.31375	-.37897	.87761
B15	Equal variances assumed	1.796	.185	1.094	66	.278	.38392	.35097	-.31682	1.08466
	Equal variances not assumed			1.064	50.503	.292	.38392	.36082	-.34063	1.10847
B16	Equal variances assumed	.329	.568	.226	66	.822	.08672	.38304	-.67804	.85149
	Equal variances not assumed			.233	60.613	.817	.08672	.37287	-.65898	.83242
B17	Equal variances assumed	.058	.810	.391	66	.697	.16260	.41585	-.66767	.99287
	Equal variances not assumed			.400	59.815	.691	.16260	.40674	-.65106	.97626
B18	Equal variances assumed	7.757	.007	-.732	66	.467	-.25655	.35049	-.95632	.44323
	Equal variances not assumed			-.783	65.480	.436	-.25655	.32762	-.91077	.39767
NFC	Equal variances assumed	1.962	.166	.083	66	.934	.12188	1.46132	-2.79574	3.03950
	Equal variances not assumed			.088	63.721	.931	.12188	1.39218	-2.65955	2.90330

*B10 The idea of relying on thought to make my way to the top appeals to me.
*B11 I really enjoy a task that involves coming up with new solutions to problems.
The above were significant at the 0.05 significance level.

4.9.3 ANOVA Test of Differences in Means: IT User Satisfaction items by Q21 Gender **(3 items with significant differences)**

Table 4.9.3 ANOVA Test of Differences in Means IT User Satisfaction items by Q21 Gender

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
System quality Our website is: Easy to understand in terms of layout	Equal variances assumed	1.331	.253	.620	66	.537	.208	.336	-.463	.879
	Equal variances not assumed			.612	59.191	.543	.208	.341	-.473	.890
System quality Our website is: Equipped with useful features and functions	Equal variances assumed	1.182	.281	.347	66	.730	.101	.290	-.479	.680
	Equal variances not assumed			.344	61.625	.732	.101	.293	-.484	.686
System quality Our website is: User-friendly	Equal variances assumed	.115	.736	.882	66	.381	.253	.288	-.321	.828
	Equal variances not assumed			.888	65.991	.378	.253	.285	-.316	.823
System quality Our website is: Aesthetically pleasing	Equal variances assumed	.078	.781	.566	66	.573	.174	.307	-.439	.786
	Equal variances not assumed			.564	63.809	.575	.174	.308	-.442	.789
System quality Our website is: Available 24X7 with very low downtime	Equal variances assumed	.835	.364	2.099	66	.040	.521	.248	.025	1.016
	Equal variances not assumed			2.104	65.616	.039	.521	.248	.027	1.015
System quality Our website is: Fast loading and has fast response time	Equal variances assumed	.206	.651	1.197	66	.236	.281	.235	-.188	.750
	Equal variances not assumed			1.179	58.016	.243	.281	.239	-.196	.759
Information quality Our information is: Accurate	Equal variances assumed	.659	.420	1.336	66	.186	.229	.171	-.113	.572
	Equal variances not assumed			1.315	57.616	.194	.229	.174	-.120	.578
Information quality Our information is: Complete	Equal variances assumed	.219	.641	.983	66	.329	.205	.208	-.211	.621
	Equal variances not assumed			.966	56.282	.338	.205	.212	-.220	.630
Information quality Our information is: Concise	Equal variances assumed	.662	.419	2.086	66	.041	.413	.198	.018	.809
	Equal variances not assumed			2.084	64.793	.041	.413	.198	.017	.809
Information quality Our information is: Easy to find	Equal variances assumed	.001	.970	1.840	66	.070	.549	.298	-.047	1.144
	Equal variances not assumed			1.846	65.745	.069	.549	.297	-.045	1.142
Information quality Our information is: Available in a useful format	Equal variances assumed	.576	.451	1.638	66	.106	.378	.231	-.083	.840
	Equal variances not assumed			1.642	65.629	.105	.378	.230	-.082	.839
Information quality Our information is: Relevant for decision making	Equal variances assumed	.084	.772	1.573	66	.121	.351	.223	-.095	.796
	Equal variances not assumed			1.551	58.763	.126	.351	.226	-.102	.803
Service quality Our service is: Clear to users as to what is available	Equal variances assumed	.060	.807	1.966	66	.053	.406	.207	-.006	.819
	Equal variances not assumed			1.955	63.075	.055	.406	.208	-.009	.821
Service quality Our service is: Prompt to users from query/request to response	Equal variances assumed	.344	.559	1.450	66	.152	.337	.232	-.127	.801
	Equal variances not assumed			1.452	65.466	.151	.337	.232	-.126	.800
Service quality Our service is: User friendly in attitude	Equal variances assumed	.822	.368	1.469	66	.147	.347	.236	-.125	.819
	Equal variances not assumed			1.480	65.998	.144	.347	.235	-.121	.816
Service quality Our service is: Oriented to understand the user's needs	Equal variances assumed	.057	.812	1.242	66	.219	.306	.246	-.186	.797
	Equal variances not assumed			1.246	65.706	.217	.306	.245	-.184	.795
Service quality Our service is: Delivered by knowledgeable staff	Equal variances assumed	1.332	.253	.793	66	.431	.184	.232	-.279	.647
	Equal variances not assumed			.782	58.990	.437	.184	.235	-.287	.655
Service quality Our service is: Assisted by self-help documentation and systems	Equal variances assumed	.548	.462	1.484	66	.143	.337	.227	-.116	.790
	Equal variances not assumed			1.506	64.828	.137	.337	.224	-.110	.783
Eval	Equal variances assumed	.663	.418	2.051	66	.044	4.42846	2.15915	.11757	8.73935
	Equal variances not assumed			2.042	63.706	.045	4.42846	2.16827	.09647	8.76046

*Eval score
*Q5 Available 24X7 with very low downtime
*Q10 (Information was) Easy to find
The above were significant at the 0.05 significance level.

4.9.4 ANOVA Test of Differences in Means: IT User Satisfaction items by Programme **(No significant differences)**
Table 4.9.4 ANOVA Test of Differences in Means IT User Satisfaction items by Q21 Programme

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
System quality Our website is: Easy to understand in terms of layout	Equal variances assumed	1.581	.213	.339	66	.735	.117	.343	-.569	.802
	Equal variances not assumed			.323	46.645	.748	.117	.361	-.609	.842
System quality Our website is: Equipped with useful features and functions	Equal variances assumed	.240	.626	.265	66	.791	.079	.296	-.513	.670
	Equal variances not assumed			.252	46.173	.802	.079	.312	-.549	.706
System quality Our website is: User-friendly	Equal variances assumed	8.427	.005	-2.277	66	.026	-.647	.284	-1.214	-.080
	Equal variances not assumed			-2.536	64.805	.014	-.647	.255	-1.156	-.137
System quality Our website is: Aesthetically pleasing	Equal variances assumed	.148	.702	.383	66	.703	.120	.313	-.505	.746
	Equal variances not assumed			.390	59.002	.698	.120	.308	-.496	.736
System quality Our website is: Available 24X7 with very low downtime	Equal variances assumed	1.555	.217	-.325	66	.746	-.085	.261	-.607	.437
	Equal variances not assumed			-.342	63.871	.734	-.085	.249	-.582	.412
System quality Our website is: Fast loading and has fast response time	Equal variances assumed	4.594	.036	-1.068	66	.289	-.257	.240	-.736	.223
	Equal variances not assumed			-1.167	65.960	.248	-.257	.220	-.696	.183
Information quality Our information is: Accurate	Equal variances assumed	1.141	.289	-.204	66	.839	-.036	.177	-.390	.318
	Equal variances not assumed			-.210	61.299	.834	-.036	.172	-.380	.307
Information quality Our information is: Complete	Equal variances assumed	4.307	.042	-.618	66	.539	-.132	.213	-.558	.294
	Equal variances not assumed			-.676	65.922	.501	-.132	.195	-.521	.258
Information quality Our information is: Concise	Equal variances assumed	2.945	.091	-.814	66	.419	-.169	.208	-.583	.245
	Equal variances not assumed			-.872	65.578	.386	-.169	.194	-.556	.218
Information quality Our information is: Easy to find	Equal variances assumed	2.842	.097	-.797	66	.428	-.248	.310	-.867	.372
	Equal variances not assumed			-.871	65.958	.387	-.248	.284	-.815	.320
Information quality Our information is: Available in a useful format	Equal variances assumed	2.477	.120	-.241	66	.811	-.058	.240	-.538	.422
	Equal variances not assumed			-.262	65.985	.794	-.058	.220	-.498	.382
Information quality Our information is: Relevant for decision making	Equal variances assumed	1.679	.200	-.144	66	.886	-.033	.232	-.496	.429
	Equal variances not assumed			-.156	65.936	.877	-.033	.214	-.461	.394
Service quality Our service is: Clear to users as to what is available	Equal variances assumed	1.059	.307	-.380	66	.706	-.082	.217	-.515	.350
	Equal variances not assumed			-.389	60.087	.699	-.082	.212	-.505	.341
Service quality Our service is: Prompt to users from query/request to response	Equal variances assumed	3.804	.055	-.184	66	.855	-.044	.241	-.525	.436
	Equal variances not assumed			-.196	65.046	.846	-.044	.226	-.496	.408
Service quality Our service is: User friendly in attitude	Equal variances assumed	.283	.597	-.085	66	.933	-.021	.245	-.510	.468
	Equal variances not assumed			-.090	64.530	.929	-.021	.232	-.484	.442
Service quality Our service is: Oriented to understand the user's needs	Equal variances assumed	3.917	.052	-.697	66	.489	-.176	.253	-.681	.329
	Equal variances not assumed			-.748	65.682	.457	-.176	.236	-.646	.294
Service quality Our service is: Delivered by knowledgeable staff	Equal variances assumed	.314	.577	.023	66	.982	.005	.238	-.469	.480
	Equal variances not assumed			.023	60.152	.981	.005	.232	-.459	.470
Service quality Our service is: Assisted by self-help documentation and systems	Equal variances assumed	1.116	.295	.400	66	.691	.094	.235	-.375	.563
	Equal variances not assumed			.425	64.989	.672	.094	.221	-.348	.536
Eval	Equal variances assumed	4.183	.045	-.551	66	.584	-1.24819	2.26651	-5.77342	3.27704
	Equal variances not assumed			-.602	65.927	.549	-1.24819	2.07192	-5.38500	2.88862

4.10 Linear Regression on Eval (IT User Satisfaction score)

Table 4.10 Linear Regression on Eval

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.472[a]	.223	.173	8.27198

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1234.021	4	308.505	4.509	.003[b]
	Residual	4310.818	63	68.426		
	Total	5544.838	67			

a. Dependent Variable: Eval

b. Predictors:

(Constant)

NFC

Q22 I am competent when using websites

Q21 I am: Male=1/Female=2

Q19 I am confident when using website

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	49.925	12.651		3.946	.000	24.643	75.206
	NFC	.246	.183	.158	1.342	.184	-.120	.612
	User I am competent when using websites	-.417	1.330	-.045	-.313	.755	-3.075	2.242
	User I am confident when using websites	3.891	1.352	.398	2.878	.005	1.189	6.592
	User I am: I am: Male=1/Female=2	-3.315	2.036	-.183	-.628	.108	-7.384	.753

a. Dependent Variable: Eval

The model had an adjusted R squared which was moderate (0.173) and F (4.509) which is low but significant (at 0.05 level).
Looking at individual variables, only “Q19:I am confident when using website” was a significant predictor at 0.05 level.

4.11.1 Confidence

NFC Score and IT User Satisfaction Scale Q19 (I am confident when using websites) correlation

NFC Score has a very small correlation (0.046) with Q19 but this is not significant at 0.01 or 0.05 level (2-tailed**).**

4.11.2 Competence

NFC Score and IT User Satisfaction Scale Q22 (I am competent when using websites) correlation

NFC Score has a small correlation (0.297) with **Q22** and this is significant at 0.05 level (2-tailed).

4.11.3 Gender (NFC)

Comparison of means for NFC Scale Items (using t-test)

Gender differences were not significant in the difference between the means for all the items (B1 to B18 and NFC Score)

4.11.4 Programme of study (major)

Comparison of means for NFC Scale Items and **NFC Score (using t-test)**

Programme (as variable) in the difference between the means were significant (0.62331, p=0.007) at 0.01 level (2-tailed) for B10* (Business more than Acct and Finance) and significant (0.6728, p=0.028) at 0.05 level (2-tailed) for B11* (Business more than Acct and Finance)

*B10: The idea of relying on thought to make my way to the top appeals to me.

*B11: I really enjoy a task that involves coming up with new solutions to problems.

4.12 Gender (IT User Satisfaction Scale)

Comparison of means for IT User Satisfaction Scale Items (using t-test)

Gender differences were significant in the difference between the means

(Males higher than Females)

at 0.05 level (4.42846, p=0.044) for **IT User Satisfaction Score (Eval)**

at 0.05 level (0.521, p=0.040) for **IT User Satisfaction Score (Q5*)**

at 0.05 level (0.413, p=0.041) for **IT User Satisfaction Score (Q9*)**

4.13 Comparison of means IT User Satisfaction Scale Items (using t-test)

Programme (as variable): differences were not significant in the difference between the means for **IT User Satisfaction Score (Eval)**.

In this chapter I have presented the results of the survey along with a number of statistical analyses of these starting with some basic summary statistics and then moving on to correlation and linear regression models.

The interpretation and discussion of these analyses are postponed to the next chapter.

Chapter 5 Discussion

5.1 Survey design and process

5.1.1 Use of incentive

An incentive of £5 cash for participation in the survey. This was given out after the student has confirmed that he/she had completed the task and questionnaire. (Singer and Ye, 2013) reviewed the findings on the effect of incentives on survey participation and found that there was support for incentives increasing participation in different kind of surveys e.g. face to face, mail and web surveys.

5.1.2 Power, effect size and sample size

From previous studies the impact of individual differences (e.g. personality) on job performance, the effect size is between 0.1 to 0.2. It is likely that we will obtain something of that order for the correlation between NFC and IT user satisfaction.

If this is so, then we can find out the sample size required for an effect size of 0.15 using the table in (Hair et al, 2010; p10) for a test of power 0.516. The sample size required is estimated to be around 250. We are using this table as a rough guide - a lengthier and more detailed treatment of this subject is found in (Bosco et al, 2015).

In speaking of correlation sizes, we can adopt Cohen's (1962, 1988) approach. Applying this convention to this study, we can see that sample size and effect size together meant that the power of the study to find a significant effect was very low which accounts for the non-significant correlation between NFC score and IT User Satisfaction score. (See section 4.8.4 NFC Scale Items and IT User Satisfaction Scale Items Correlations). **NFC Score** had a small correlation (0.17) with **IT User Satisfaction Score** but this is not significant at 0.01 or 0.05 level (2-tailed)).

Some authors have suggested that the conventional significance levels such as 0.01 and 0.05 should not held to religiously (e.g. Amrhein et al, 2017; Wu, 2018) as this is too rigid and approach and a misunderstanding of the intent of the Null Hypothesis Significant Resting methodology as envisaged by its creators. Instead it is recommended that the p values should just be reported with a 95% Confidence Interval.

5.1.3 Response rate

The response rate for this study was 25.9%. (Anseel et al, 2010) found that response rates in organisational studies surveys published in journals between 1995 and 2008 varied depending on the level of the employee. Executive managers had the smallest response rates (mean = 35.7%) whereas non-managerial employees tended to have the highest (mean = 52.7%). Clearly, respondent type was the most important consideration. The

article also reported a drop in mean response rate from the decade before. An analysis of the Management Information Systems survey research literature for the period 1980 to 1990 (Pinsonneault and Kraemer, 1993) had found that 84% of exploratory surveys, 77% of the descriptive surveys, and 68% of the explanatory surveys had a response rate below 51%. In this study, 23 (out of 263) respondents failed to complete the survey (with most only completing half of it). If these were included, it would increase the response rate to 34.6% from 25.9% which would bring it closer to the response rate reported in (Anseel et al, 2010).

The effect of nonresponse on nonresponse bias is discussed in (Groves and Peytcheva, 2008) and is quite a complex matter. The key questions are whether there are any survey design characteristics, properties of the target population, or estimation procedures that might be systematically related to the nonresponse bias. In this study these don't appear cause concern.

5.2 Statistical methodology and analysis

Reliability and Validity

The 18 item Short Form Scale has been widely used in previous studies and has been proven to be highly reliable. In this study, the Cronbach Alpha was calculated to be 0.803 which is considered high so there is high internal reliability. 10 out of 18 items correlated to the 0.01 significance level with the overall NFC Score, 1 item correlated to the 0.05 significance level with the overall NFC Score and 7 items did not correlate to the 0.05 significance level with the overall NFC Score. This still shows a high degree of internal consistency within the scale.

The IT User Satisfaction Scale has been assembled from the well known instruments used in previous research on user satisfaction as explained in the Chapter 3. The Cronbach Alpha was calculated to be 0.905 which is considered as representing a very high internal reliability. All 18 items (Q1 to Q18) correlated to the 0.01 significance level with the overall IT User Satisfaction Score showing a very high degree of internal consistency within the scale.

Since both instruments used were taken from the relevant tried and tested research already undertaken, the internal validity is assumed to be high for both the constructs and the instruments measuring these constructs. There have been ample evidence supporting the instruments since their inception as reported in Chapter 3.

5.2.1 Statistical techniques, analyses and interpretation

Here we summarise the main results of the study and the interpretation of these results.

Correlations with IT User Satisfaction:

NFC

The main finding is that there is a small positive correlation (0.17) between NFC and IT User Satisfaction.

Confidence belief

IT User Satisfaction Score has a moderate correlation (0.409) with Q19 (Confidence belief) and this is significant at 0.01 (2-tailed).

Competence belief

IT User Satisfaction Score has a small correlation (0.248) with Q22 (Competence belief) and this is significant at 0.05 (2-tailed)

Multiple regression:

1) The model (with NFC, Gender, Confidence and Competence as predictor variables) and IT User Satisfaction as response variable is significant at the 0.05 significance level (i.e. at least one of the variables is a significant predictor. In this case, this is Confidence belief).

2) The Standardised Beta Coefficients of the predictors were given as:

a) NFC = 0.158
Higher NFC predicts higher satisfaction scores
b) Competence = -.045
Higher Competence belief predicts lower satisfaction scores.
c) Confidence = 0.398
Higher Confidence belief predicts higher satisfaction scores
d) Gender = - 0.183 (going from 1 = Male to 2 = Female)
Being Female predicts lower satisfaction scores than being Male.

The sizes of the Beta Coefficients give some indication of the weights of these variables in terms of prediction of IT User Satisfaction. It is easy to see that Gender, Confidence belief and NFC are the most important predictors. All of these relationships have been discovered in previous research studies except (b) which is counterintuitive. It may, perhaps, be explained by the possibility that greater competence belief may be accompanied greater fastidiousness and greater likelihood of finding flaws in the IT system.

ANOVA:

Gender differences were significant in the difference between the means

(Males higher than Females) at the 0.05 level (4.42846, p=0.044) for IT User Satisfaction Score (Eval)

This suggests that Females are likely to report lower satisfaction scores than Males (as found in previous research on gender differences).

5.2.2 Reducing biases and errors

According to (Biemer, 2010), research should aim for total survey quality which is achieved with careful design, implementation and evaluation. In particular, survey bias should be eliminated or reduced in general whether it be in sampling design, response bias, researcher bias or research process bias and sources of measurement error should be identified (Burton-Jones and Lee, 2017), some of which have already been covered in the methodology chapter. As an example of this, reverse scoring in the NFC Short Form Scale was used to prevent response bias where the respondent may wish to increase social desirability by responding in what might be thought to be expected ways to items in the survey.

There are many other types of biases under the umbrella of “Common Method Bias” explicated in (Podsakoff et al, 2003) that it would useful to know so as to prevent these from occurring accidentally. The main categories listed in the article are “Common rater effects” (of which social desirability might be an example), “Item characteristic effects” (for example, item demand characteristics where items contain hidden cues for how to answer them, “Item context effects”(for example, item priming effects where the positioning of an item may make it more salient) and “Measurement context effects” (for example, where the measurement of two constructs at the same location could make them more likely to show an association). With full knowledge of the above, these biases were avoided during this research investigation.

5.3 Theoretical limitations

Although this study has found that there is a positive association between NFC and IT User Satisfaction (r = 0.17), we do not have a theory of how this association comes about and have assumed a “black box” connecting the two constructs. Steps to address this gap in knowledge would probably involve addressing better the following theoretical limitations:

5.3.1 Lack of clarity on satisfiers and dissatisfiers

The models used in this research do not make clear which factors are satisfiers and which are dissatisfiers. Knowing this would make it easier to specify more clearly and to more effectively design IT systems to better meet the requirements of users. However, a line of thinking going back to Herzberg et al (1959) helpfully suggest that there are two kinds of factors (motivators and hygiene) which are represented by two distinct scales –which determined

satisfaction and dissatisfaction in the workplace. The opposite of “satisfaction” is “non-satisfaction” rather than “dissatisfaction” as erroneously conceived by many. (Zhang and Von Dran, 2000) proposed something similar for a web site evaluation. Increasing motivators cause increase in satisfaction and but the lack of hygiene factors cause an increase in dissatisfaction. Applying this to their study, they found that the hygiene factors included navigation and technical aspects. These were dissatisfiers if they were inadequate. The motivators were enjoyment, cognitive outcomes and credibility, essentially those factors that increased emotional and cognitive engagement. (Mullany et al, 2006) offer a scale for measuring user satisfaction based on Herzberg’s theory of motivation. This is based almost entirely on user complaints. It is claimed that this scale is more accurate as the scale includes everything that is important to the user and does not include anything that is not. This concept of user satisfaction is one devoid of user dissatisfaction and complaints or resistance. The number and intensity of complaints is useful information here. To add further complication, Woodroof and Burg (2003) argued that user traits might also predispose some users to satisfaction/dissatisfaction and presented evidence that Negative Affectivity in the user is associated with a negative evaluation of the IT system i.e. the users reported negative evaluation regardless of the IT system’s features. This means that the outcome of the evaluation is already determined before the evaluation is undertaken and the actual system features and functions make little contribution to how the system is evaluated.

In addition to these, (Mullany et al, 2007) reported that cognitive style differences between IT system analyst and the user are also important. Cognitive style is the mental organization of concepts and how users use this in problem solving. Negative satisfaction is associated with greater differences in the cognitive styles between analyst and user, known as the cognitive gap. The implication is that this gap should be minimised over the period of system usage to avoid user dissatisfaction.

5.3.2 Lack of theory linking needs to IT User Satisfaction

A complete framework for user satisfaction should show a mechanism linking user needs and what those needs motivate the user to look for in an IT system that will meet those needs. Maslow (1970)’s hierarchy of needs is popularly used in the management literature but it has yet to be substantiated by any empirical research. However, (Sheldon et al, 2001) provides a list of ten basic needs from an empirical study. Among the top needs are autonomy, competence, relatedness, and self-esteem. Needs create user motivation for technology affordances. (Faraj and Azad, 2012) explains how affordances are the perfect examples of the sociomateriality of technology and organisation as it is not the technology itself nor structure but both combined with user agency that create the desired technology appropriation process and outcome. According to the authors, technology affordances are, by nature, action possibilities and opportunities arising out of actors engaging with technology through agency and within structures. What is clear here is that it is not the technology features themselves but the affordances which emerge out of

these features in a particular context which provide the ability to meet the needs of users.

A recent article (Karahanna et al, 2018) illustrates the use of a comprehensive theoretical framework which addresses the Needs Affordances Features chain. The authors applied this framework to analyse the use of social media applications. Five psychological needs (for autonomy, relatedness, competence, having a place, and self-identity) were identified that were relevant to social media use and affordances were then mapped onto these needs. This approach has great potential for design science where designers are more likely to be able to engage users through their understanding and fulfilling better the needs that users have. They can also better bundle the features that would provide the right affordances for user action possibilities through creating the appropriate user perceptions that would induce user satisfaction. Just to give an idea of what these might be, the authors came up with a long list of social media affordances: Self-presentation, Content sharing, Interactivity, Presence signalling, Relationship formation, Group management, Meta-voicing (i.e. reacting to others), Communication, Collaboration, Competition and Sourcing.

It can be seen that this approach appears to be a counterbalance to the Technology Acceptance Model and the DeLone and McLean IS Success Model as these models essentially leave open the question of user needs and concentrate only on what impacts these needs have on the perception of usefulness and ease of use and thence to attitudes and intentions to behave, that is, their explanation of the mechanism causing user satisfaction starts with those two variables.

5.3.3 Lack of connection with the popular use of Core Self Evaluation construct
Individual predispositions have been known to affect job satisfaction and performance since the early years of Industrial and Organisational Psychology. In the last twenty years, however, following the lead of personality psychology, combined construct testing has become quite popular. In this regard, (Judge et al, 1998) recommended using an aggregated higher order construct they termed “Core Self Evaluation”. This consists of four constructs determined by three criteria which are evaluation-focus (and not descriptive only), fundamentality (is core or central to the individual), and scope (is broad rather than narrow to cover more job demands). These four constructs are: self-esteem, generalized self-efficacy, emotional stability, and locus of control (Chang et al, 2011). The rationale behind this is that high correlations (an average of 0.6) have been found between these constructs and considering these together may offer a greater ability to explain the variance in job satisfaction/performance.

(Johnson et al, 2008) explained that as a clear conceptualisation of the construct, Core Self Evaluation might be considered as people’s beliefs about their ability to interact with their environment successfully by changing their own behaviour as well as changing external events. In other words, this means the belief in the ability to self-regulate behaviour (or belief in self-regulatory capacity). They also suggest that an approach rather than avoidance

motivation usually is operative in individuals high in Core Self Evaluation. This is because the individual is likely to be positive in their self-evaluation and up to the challenge of the task.

As we have seen in this research, self belief about confidence has quite a large effect on user satisfaction. This belief about confidence can be considered an Expectancy Belief as this is a belief about successfully performing the task and using the system to get the right outcome. The Core Self Evaluation construct could be used measure using the existing scale to see what this would indicate. This would be better than just using two questions in IT User Satisfaction Scale (Q19 on Confidence and Q22 on Competence).

There is the question of whether Core Self Evaluations change over time. (Johnson et al, 2008) suggest they are most likely to. At the same, they believe that this construct could be employed in Human Resource Management (for example, for selection purposes) but advised that there needs to longitudinal assessment of how this construct would change over time and as a result of experience, learning and development in a changing job and organisational environment.

5.3.4 Lack of connection with investment traits

In addition to the personality traits identified in the literature review, more recently a fruitful new line of research has identified traits called “Investment traits” in (Von Stumm and Ackerman, 2013) which have been found to influence the development of mental ability or intellect (or some types of intelligence). They do this by determining when and where effort is expended in mental tasks such that over the lifespan of the individual this trait plays the role of promoting the growth of the intellect. 34 trait constructs were found and categorised into eight groups: Ambiguity, Novelty Seeking, Openness, Absorption, Intellectual Curiosity, Abstract Thinking, Social Curiosity and Investment of which the Need For Cognition is a major investment trait. The finding is that there is a positive correlation (of about 0.3) between investment traits and intellect in adulthood, although this does vary across the different investment traits.

(Von Stumm, 2013) found the investment trait “Openness to Experience” to be more strongly associated with intelligence (as knowledge) than “Need For Cognition”. Both were positively correlated to Intelligence. In relation to this research, this could be a clue that the same effect might also apply to phenomena like satisfaction. The reasoning is that a broad personality trait like “Openness to Experience” is likely to exert an influence greater than that exerted by the narrower trait “Need For Cognition” and apply in more domains so the effect of “Need For Cognition” may be masked by this trait in the measurement.

It would be interesting to see what the effect would have been if items measuring “Openness to Experience” had been used. At the same time, it would worth exploring if other investment traits that might be good predictors of IT User Satisfaction. “Intellectual Curiosity”

A general question is whether personality is related to ability. The investment trait approach would suggest that intelligence is put to use in particular ways in particular situations and contexts depending on personality individual differences so it would appear that ability is associated with personality due to that mechanism not that this relationship is naturally hardwired. There is also a social dimension to this as individuals create their social environments where intellectual ability is put to work or tested (and developed) and personality would have some bearing on how this plays out.
(Von Stumm et al, 2011) showed how the above applies also in academic performance where it is not just ability and effort that determine success. They introduce the construct of "Intellectual Curiosity" (or the "hungry mind") as the third determinant.

5.3.5 Need to consider postadoption use and continuance of use
This research investigation has looked at technology adoption and the determinants of user satisfaction. This is one phase of the IT implementation cycle. However, there are other stages. A six-stage model of the IS implementation process as is described in (Hsieh and Zmud, 2006) consists of: initiation, adoption, adaptation, acceptance, routinization, and infusion. Research in IS has shifted interest to post-adoptive behaviour (Jasperson et al, 2005) and the difficult task of encouraging continued use of IT systems and even promoting enhanced use of IT features in the workplace.

The requirements are different from those in the adoption phase as continuance of use depends on less deliberative thinking but more on habit and automated cognition. The continued use of the system and evaluation is likely based on experiences of prior use. It is also necessary to consider both the individual as well as the organisation as espoused in sociotechnical systems design and advanced in structuration/sociomateriality theory. However, it is not all smooth going as it is still possible that discontinuance of use could occur if the wrong conditions are in existence and there is lack of support and leadership which are apparent to employees using the system.
Over time, the features of the IT system are explored and use of the system may evolve over time with feature extensions used for tasks in innovative ways. Technology sensemaking occurs when users encounter surprise in their exploration of IT system features. In terms of research methodology, a longitudinal study is required and a combination of methods would be needed such as observation and think aloud protocol analysis as well as in depth interviews. This would be an intensive way of studying the IT system and its use over time. As such, there could be difficulties obtaining access to employees' time but it would be worth it if usage is made more effective as a result of the study.

The assumptions about acceptance and behaviour of users in this phase are different from before. Theory needs to account for the complex set of individual-organisational dynamics that would determine how the system, user and work would evolve. (Bagayogo et al 2014) offer a rich account and go into great detail in the conceptualisation of enhanced use and what this involves.

They explain the important roles played by the characteristics of the task, IT related knowledge, and the type of IT in this shaping of enhanced use.

5.3.6 Need to consider levels of organisation

This study is focussed on IT evaluation at the individual level. Exactly how this translates into organisational IT evaluation as an organisational capability and competitive advantage as described in the literature review is left unexplained due to the complexity of this undertaking and lack of access to longitudinal data that would allow this conversion of individual to organisational capability to be monitored and analysed.

5.4 Methodological limitations

The weaknesses and limitations of the research methodology are described below:

5.4.1 Research Methods

The online survey method was used instead of a face to face method. As explained before in Chapter 3, this results often in a lower response rate. This also means that the researcher is unable to check that the user has actually performed the task set and has properly filled in the two scale questionnaires. Set against this, there is greater convenience for the researcher to manage the survey process and the data that result from this. It also allows the participant to do the task and fill in the survey at their own convenience.

The research design chosen was a cross-sectional one and was a snapshot over a period of 6 months. The method used was self-reporting that assumes that the self-reporting is honest and accurate. Bias may be due to social desirability and also entail lack of objectivity in the responses for some items. The IT system studied was a general purpose one (i.e. the website of Kent Business School) which may result in substantial differences in the outcome from one that is more focussed on work processes, for example, a specially designed and implemented work system.

5.4.2 Measurement instrument

The measurement instrument consisted of two scales and a task to be performed. Judging from the 23 incomplete responses, it could be that the instructions were not clear enough about there being two scales (all the incomplete responses were to do with the second scale i.e. IT User Satisfaction scale and not the first i.e. NFC scale).

It might also be that the reason for non-completion could be because the entire survey take about 10 minutes or so to complete and this was too long for some students.

5.4.3 Sampling frame, sample size and composition

The sampling frame was taken to be the list of students on the two modules that we taught. This was done to help increase the number of students that would participate in the survey as the students had a connection with me and the call for the survey as not from a completely unknown researcher. However, there may have been a small tendency to give positive responses as it might have been seen to be socially desirable to do so.

The population from which the sample was drawn was the students in Stage 2 of their degree programme. This is a specific group and especially when it comes to age (almost all the students were less than 25 years old). This restricts the generalisation of the findings and limits what we can say about the association between NFC and IT User Satisfaction for other age groups and the non-student population.

The small sample size also raises problems of power of the study to detect a significant effect given the likely small effect size. As this study is exploratory, this is not necessarily a major problem here but to confirm the results obtained in this study a much larger sample size would be needed (say, around 500).

5.4.4 Nonresponse rate

The response rate was 25.9% which is moderate. However, it would have been better if the threshold 51% could have been achieved as it would have given greater assurance that nonresponse bias was not operative in this study. It was difficult to find out whether the respondents were systematically different from those unable or unwilling to participate.

5.4.5 Statistical techniques

Since the sample size was small (N = 68), the more powerful and sophisticated statistical techniques such as Structural Equation Modelling (Covariance Based or Partial Least Squares Based) could not be used which could have helped in analysing moderator and mediator variables in the statistical model (Holmbeck,1997; Whisman and McClelland, 2005).

5.5 Suggestions for future research

5.5.1 Study a different population

The student sample is age restricted and young (under 24 years of age). Future study could investigate non-students (commercial organisational employees) and older users (over 30 years of age, for example).

Empirical research could be conducted on other populations, namely, managers, in different industries/ sectors (be they public, private or third) and could also include studying generational differences in IT use and perception.

5.5.3 Use a longitudinal approach

The method used in this study was cross-sectional measurement which is good as a snapshot but a longitudinal approach could allow the investigator to learning over time how to get better data and study the evolving use of the IT system towards successful outcomes.

5.5.4 Use a variety of research methods

To uncover the mechanisms connecting NFC and IT User Satisfaction, a mix of subjective and objective methods could be used. For example, the methods of investigation could be observation, video recording (ethnography), thinking aloud protocols, objective measures of performance in addition to self reports (for example, eye tracking technology to monitor the attention of the IT user when using the IT system), co-worker ratings or team research methods to widen the possibilities of collecting richer data. However, there may be concerns about overstepping the ethical line with worries about privacy and confidentiality.

Opening the NFC - IT User Satisfaction black box will also require a better theoretical framework and will need investigations at different levels of analysis and corresponding use of multilevel analytical statistical techniques.

5.5.5 Consider using an IT specific NFC measurement instrument

Lastly, future studies could look at the question of whether there is an IT specific NFC similar to the constructs such as Computer Self Efficacy, Computer Playfulness and Computer Personal Innovativeness that have already been proposed (Agarwal and Prasad, 1998). NFC so far has been a generic construct not specific to any domain. With the rapid advance of IT systems, it could be argued that a measurement scale more attuned to IT needs would be welcome.

In this chapter we have discussed the results of the research investigations and looked at the theoretical, methodological and practical implications of these for the research field.

In terms of theory, we have highlighted the limitations of the research. Included in these are the missed opportunities for connecting with other streams of research. We have made suggestions for future research connected with investment traits which may be fruitful for exploring cognate constructs to Need For Cognition such as Typical Intellectual Engagement. Another active area of research is Core Self Evaluation which is helping to clarify the nomological network of self concept which will be beneficial to any future research work on this topic.

In terms of methodology, there are many possibilities for future work including using longitudinal approaches, neuroscience instruments for monitoring brain activity and collecting richer data using qualitative techniques such as Critical Incident Analysis, Ethnography and Phenomenology.

The next chapter provides some concluding thoughts and gives recommendations for management and organisational practice following from the findings.

Chapter 6 Conclusion

6.1 Revisiting the aims, research questions and hypotheses

This research investigation aimed to understand the nature of the construct Need For Cognition in the context of IT evaluation and specifically how it is associated with IT User Satisfaction.

The research questions as formulated at the start of the research were as follows and their respective answers are given below:

Research question 1

How internally reliable is the “Need For Cognition” short form?
Answer: Very reliable (Cronbach Alpha of 0.803)

Research question 2

How internally reliable is the “IT user satisfaction” scale developed for the website evaluation?
Answer: Very reliable (Cronbach Alpha of 0.905)

Research question 3

What is the relationship between “Need For Cognition” and “IT user satisfaction” constructs as measured by the scales employed?
Answer: A small positive correlation was found (r=0.17)

Research question 4

To what extent does the variable “Need For Cognition” determine “IT user satisfaction” (the effect size) and how does this compare with the effect of the variables “gender”, “perceived confidence with IT” (Confidence Belief) and “perceived competence in using IT” (Competence Belief)?
Answer: Taking the Standardised Coefficient Beta values, the variable has similar weight (.158) in the regression model predicting “IT user satisfaction” as “Gender”(-.183) except for the positive sign instead of negative but less weight than Confidence Belief (.398). Competence Belief had the smallest weight (-.045).

We refer back to the hypotheses:

H1: There is high internal reliability (Cronbach Alpha of over 0.75) for the “Need For Cognition” short form scale

H2: There is high internal reliability (Cronbach Alpha of over 0.75) for the “IT user satisfaction” scale used for the website evaluation

H3: There is a small positive correlation (r between 0.10 and 0.20) between the “Need For Cognition” score and the “IT user satisfaction” score

H4: The relative importance of NFC is moderate compared with other variables in the model of determinants of “IT user satisfaction” e.g. “gender”, “perceived confidence with IT” and “perceived competence in using IT”

We found support for H1 and H2, that is, that the reliability of the NFC Scale as well as for IT User Satisfaction Scale were high, both with Cronbach Alpha of over 0.75.

“Age” was not tested but prior studies elsewhere had found that this was relevant. As there were only 2 students (out of 68) were not in the 18 to 24 age range, it was not possible to test this anyway in this study.

We found regarding H3, that the correlation between “Need For Cognition” score and the “IT user satisfaction” score was r = 0.17 (i.e. small, positive) or an R^2 =0.028. In other words, the variance in user satisfaction explained was 2.8% This supported H3 as r was between 0.10 and 0.20 as predicted and it may be considered that NFC explains a small percentage of the variance in user satisfaction.
“Gender” (Q21), “Confidence belief” (Q19) and “Competence belief” (Q22) were the other main predictors of IT User Satisfaction as suggested by H4 but “Gender” (Q21) and “Competence belief” (Q22) were found to be negatively associated with IT User Satisfaction according to the linear regression model whereas “Confidence belief” (Q19) was found to be positively correlated.

In the next sections we will elaborate on the implications and recommendations for practice in the work and organisation context generally and in the management of IT systems and IT evaluation in particular.

6.2 Implications and recommendations for IT evaluation

The research findings suggest that there are individual differences in Need For Cognition which is the predisposition of the individual employee to expend effort in and to enjoy thinking, or in other words, to have high cognitive motivation. The research looked at an IT evaluation task and found a small positive effect of NFC on user satisfaction. The exact mechanism producing the outcome is not explored here but from the explication of the construct this may be due to the more care and attention that user employs when evaluating the IT system. Possible superior characteristics of a user measuring high on NFC may be as enumerated in (Wu et al, 2011) which listed four in major ones in particular:

1) Their tendency to engage in and enjoy situations with the qualities of novelty, complexity, and uncertainty and which arouses their curiosity for new information
2) Their ability to link new and existing information and acquire information in a flexible way
3) Their tendency to engage in deeper thinking and elaboration
4) Their likelihood to maintain a strong attitude and commitment to decisions or an issue after careful elaboration and be less likely to be swayed or persuaded by others

As noted above, the main distinctive attributes of an employee with high NFC are the extra effort that that employee is ready to put into a cognitive task and the better use of central information processing vs peripheral processing as compared with another employee with low NFC (Cacciopo et al, 1996).

In this regard, it would be useful for there to be an initial screening of IT evaluation participants to select the ones with higher NFC for evaluating critical IT systems as they are more likely to expend effort and perseverance in doing the evaluation as well are better attend to the finer details of such an evaluation and the weighing of information in reaching a response.

6.3 Implications and recommendations for IT management

Since the NFC construct is meant to be domain independent and indicate a global disposition, a user high in NFC might be usefully deployed in other testing and evaluation of IT systems during different phases of IT management lifecycle. Examples of these might be in gathering user requirements, designing and prototyping systems, building systems, testing and coming up with creative uses of implemented systems.

Also, these users might also benefit most from training and development and become lead users of new IT systems. They could help form policy in the use of these systems and to design improved or radically different new systems. Their interest, curiosity and persistence can help promote the importance of a learning culture in the department and organisation and creative ways to get the most value out of these systems. Design of IT systems would be an area where these individuals might excel either as producer or as consumer.

This could also apply to all levels of engagement – individual, small group, large group, intergroup, organisation as well as interorganisational. They could also contribute to building a positive environmental, cultural and communication context to support more effective use of the IT system and in problem solving in general.

6.4 Implications and recommendations for organisation and work design

Since the NFC construct is a general one, it applies also to other tasks, roles, jobs, work and activities within the organisation, in fact, anything that involves thinking, judgement and decision making preferences of employee in the course of carrying out his/her job or in supporting other managers in doing their jobs. The whole field of Industrial and Organisational Psychology is focussed on identifying person-job/organisation/environment-fit that includes studying dispositional (as is the case with NFC here) as well as situational motivation (for example, what factors motivate employees) (Arvey et al, 1991). This is represented also as the Intrinsic vs Extrinsic motivation issue explicated in Self Determination Theory (Deci and Ryan, 2000).

An area which has seen a lot of research and application in Industrial and Organisational Psychology is recruitment/selection of suitable employees and personnel testing. Testing for NFC during the selection process could be added to the usual Intelligence, Personality and Motivation tests already in place for jobs in most organisations. The Short Form Scale is quite easy to administer and has high reliability and validity. A high NFC score can also be used for job placement and assignment where jobs requiring unusually high cognitive motivation demands can be given to an appropriate member of staff based on the measurement of NFC.

At an even higher level of organisation, organisations can perform more effective work design and job crafting (Oldham and Hackman, 2010) by trying to obtain a better fit between employee dispositions, job characteristics and work contexts. In other words, differential diagnosis can be employed to determine where design and deployment interventions can be useful or effective given particular inclinations, strengths, motivations and preferences of a high NFC employee.

Over the longer term, employee experiences, training and development can be tailored to the individual difference concerned (i.e. NFC) as well as be part of career planning for a path to maximise the gains to be obtained from the special qualities of the employee. Individual differences in NFC also need to be considered at different levels of organisation (individual, group, larger organisation) and in different roles – producer, consumer, manager, support, community and culture builder.

6.5 Concluding remarks

The Need For Cognition construct is potentially relevant and important to organisations. We have investigated this potential in the context of IT evaluation where a small positive effect on user satisfaction was found. NFC is considered important in organisation through the predisposition towards cognitive effort and information processing and thus not just affecting IS attitudes and use behaviour but impacting on all organisational activities where effort might be needed to handle perception beliefs attitude and likely use and continued use of IS.

However, as discussed in Chapter 5, its importance goes beyond the construct itself. Recent research has suggested that it is likely to be connected to other aggregate constructs currently being investigated such as Core Self Evaluation, Investment Traits and also to other notions of satisfaction, affordances and evaluation frameworks to further expand the future research possibilities. It appears that in terms of IT evaluation at least, the main categories of determinants of satisfaction (excluding demographic factors and actual ability) are likely to be something connected with the Self-Concept and involving some measure of Intellectual Curiosity.

The emergence of job crafting is also very interesting. As the nature of work is continually evolving and the technology that goes along with it is changing rapidly, the ideal scenario is that the person-job fit (as well as the

corresponding person-environment/supervisor/organisation - fit) should evolve accordingly. This would mean that work design has to take into serious consideration individual differences in predispositions as well as personality, intelligence and motivation on a dynamic basis and at the same time provide desirable attributes of autonomy and relatedness.

In conclusion, this research investigation has been fruitful in providing a useful model for predicting IT user satisfaction as the dependent variable from individual difference constructs acting as independent variables, the ones investigated here being Need For Cognition (or some other investment trait in the cognate field) and Confidence Belief (or an aggregated construct such as Core Self Evaluation). These are in addition to demographic variables such as Gender and Age which are also known to determine IT user satisfaction. The report has acknowledged its limitations and weaknesses, made recommendations for future academic research to connect to other research streams and outlined the implications for future organisational and management practice in areas such as organisation and work design and personal and career development in addition to technology management practices such as IT evaluation which was the subject of this investigation. Individualised design taking into consideration individual differences could revolutionise our approach to IT management as well as to organisation more generally.

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Appendices

Appendix A

Instructions to participants and Measurement Scales
Dear participant
Thanks very much for agreeing to participate in this study.
There are three parts to this study:
Part A:
Fill in the Need For Cognition Questionnaire.
Part B:

The following task concerns the use of the KBS website for postgraduate student applications.

Please follow the instructions below:

Before you start the web task please use the Steps Recorder to record the steps you take (see section below).
1. To open Steps Recorder, select the Start button, and then select Windows Accessories > Steps Recorder (in Windows 10), or Accessories > Problem Steps Recorder (in Windows 7 or Windows 8.1).
2. Select Start Record.
3. Go through the steps for the website task.
4. When you're done, select Stop Record.
5. Review the record of the steps you followed to make sure it shows what you want it to show. Select Save, name the .zip file, choose where to save it, and then select Save. Now you can attach and send this .zip file to me (tly@kent.ac.uk)

Website task

1. Visit the home page for the University of Kent (i.e. www.kent.ac.uk)
2. Make your way to the website for Kent Business School.
3. Find out what postgraduate courses are available.
4. Search for the Finance and Management MSc course
5. Find out the requirements for entry onto the course
6. Find out the fees for the course.
7. Find out the required steps to make an application.

Part C:
8. Fill in the evaluation questionnaire.

The 18 Item NFC Scale below is a short form of the scale taken from (Cacioppo et al 1996)
18 Item NFC Scale
(* Reverse scored)
Name:

Using the following scale where 1 means strongly disagree and 7 means strongly agree, please rate your agreement with the following 18 statements.

Short Form of the Need for Cognition Scale
(Cacioppo et al, 1984; p307; 1996; p253)
Instructions: For each of the statements below, please indicate to what extent you agree with the statement.
1= Strongly disagree
2= Disagree
3= Somewhat disagree
4= Neither agree nor disagree
5= Somewhat agree
6= Agree
7= Strongly agree

1. I would prefer complex to simple problems.
1 2 3 4 5 6 7

2. I like to have the responsibility of handling a situation that requires a lot of thinking.
1 2 3 4 5 6 7

3. Thinking is not my idea of fun. *
1 2 3 4 5 6 7

4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*
1 2 3 4 5 6 7

5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.*
1 2 3 4 5 6 7

6. I find satisfaction in deliberating hard and for long hours.
1 2 3 4 5 6 7

7. I only think as hard as I have to.*
1 2 3 4 5 6 7

8. I prefer to think about small, daily projects to long-term ones.*
1 2 3 4 5 6 7

9. I like tasks that require little thought once I've learned them.*
1 2 3 4 5 6 7

10. The idea of relying on thought to make my way to the top appeals to me.
1 2 3 4 5 6 7

1 1. I really enjoy a task that involves coming up with new solutions to problems.
1 2 3 4 5 6 7

12. Learning new ways to think doesn't excite me very much.*
1 2 3 4 5 6 7

13. I prefer my life to be filled with puzzles that I must solve.
1 2 3 4 5 6 7

14. The notion of thinking abstractly is appealing to me.
1 2 3 4 5 6 7

15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
1 2 3 4 5 6 7

16. 1 feel relief rather than satisfaction after completing a task that required a lot of mental effort.*
1 2 3 4 5 6 7

17. It's enough for me that something gets the job done; I don't care how or why it works.*
1 2 3 4 5 6 7

18. I usually end up deliberating about issues even when they do not affect me personally.

1 2 3 4 5 6 7

*Items starred are reverse scored in the computation of the NFC score i.e. if the participant chose 1, the score would be (8-1) instead. The participants were not informed of the items which were of this kind. The purpose of this is to reduce the number of responses aimed at increasing the participant's social desirability.

Afterwards, the participants fill in a website evaluation questionnaire (as shown below)
Website evaluation questionnaire
Name:
Instructions: For each of the statements below, please indicate to what extent you agree with the statement.
1= Strongly disagree
2= Disagree
3= Somewhat disagree
4= Neither agree nor disagree
5= Somewhat agree
6= Agree
7= Strongly agree

System quality
Our website is:

Q1 Easy to understand in terms of layout

1 2 3 4 5 6 7

Q2 Equipped with useful features and functions

1 2 3 4 5 6 7

Q3 User-friendly
1 2 3 4 5 6 7

Q4 Aesthetically pleasing

1 2 3 4 5 6 7

Q5 Available 24X7 with very low downtime

1 2 3 4 5 6 7

Q6 Fast loading and has fast response time

1 2 3 4 5 6 7

Information quality

Our information is:

Q7 Accurate

1 2 3 4 5 6 7

Q8 Complete

1 2 3 4 5 6 7

Q9 Concise
1 2 3 4 5 6 7

Q10 Easy to find

1 2 3 4 5 6 7

Q11 Available in a useful format

1 2 3 4 5 6 7

Q12 Relevant for decision making

1 2 3 4 5 6 7

Service quality

Our service is:

Q13 Clear to users as to what is available

1 2 3 4 5 6 7

Q14 Prompt to users from query/request to response

1 2 3 4 5 6 7

Q15 User friendly in attitude

1 2 3 4 5 6 7

Q16 Oriented to understand the user's needs

1 2 3 4 5 6 7

Q17 Delivered by knowledgeable staff

1 2 3 4 5 6 7

Q18 Augmented by self-help documentation and systems

Q19

User

I am confident when using websites
1 2 3 4 5 6 7
User

Q20
User
My age is:

1 = 18 - 24
2 = 25 - 34
3 = 35 - 44
4 = 45 - 54
5 = 55 - 64
6 = 65 or older

Q21
User

I am:

1 = Male
2 = Female

Q22
User

I am competent when using websites
1 2 3 4 5 6 7

Appendix B Results

Participant	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	NFC Score (%)	Eval(%)	Programme	Gender
1	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1	2	7	5	5	5	6	5	6	6	5	6	6	5	6	6	5	5	4	7	6	61.9	100.0	1	2
2	6	6	5	6	7	6	6	6	5	3	6	6	6	5	6	5	5	5	6	1	2	6	4	4	6	6	6	4	5	6	7	5	5	7	6	5	6	5	5	6	61.9	79.4	1	2
3	5	5	5	6	6	6	7	7	7	5	6	6	5	6	6	5	6	6	7	1	1	7	5	6	6	6	4	5	4	3	3	7	6	6	4	6	6	4	6	6	61.1	83.3	1	1
4	6	5	5	5	6	6	6	6	6	5	5	5	5	6	6	5	3	4	3	4	1	2	5	6	6	6	6	6	6	3	6	4	6	7	6	5	5	4	2	6	6	60.3	73.0	1	2
5	6	6	6	5	4	5	6	6	4	5	7	6	5	7	6	3	6	4	7	1	2	7	6	5	6	6	7	2	5	6	5	7	7	3	3	5	2	2	2	6	63.5	77.0	1	2
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	2	6	4	5	6	6	6	5	4	4	4	4	6	6	4	4	4	6	7	5	66.7	85.7	1	2
7	7	7	7	6	7	7	6	5	6	6	6	6	6	6	6	6	6	6	6	1	2	7	4	5	6	4	5	3	6	2	4	6	6	6	5	6	4	6	6	6	63.5	88.9	1	2
8	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	1	1	6	5	7	7	6	7	5	6	5	6	6	7	6	5	5	6	7	6	6	69.1	85.7	1	1
9	7	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	7	1	1	7	5	6	6	6	6	6	6	6	6	6	6	6	6	2	6	6	6	5	6	68.3	96.8	1	1
10	5	4	2	5	3	3	5	5	3	3	3	3	4	3	3	5	5	5	7	1	2	7	3	5	6	6	5	6	6	3	3	6	7	7	4	5	6	3	5	7	59.5	54.8	1	2
11	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	1	2	5	7	4	5	3	3	4	3	3	4	5	5	4	3	3	4	4	5	5	57.1	69.1	1	2
12	7	7	7	7	7	7	7	5	7	7	7	7	7	7	7	7	7	7	7	1	1	6	3	5	4	1	3	1	3	6	4	4	5	2	5	6	3	4	3	4	47.6	98.4	1	1
13	7	6	7	6	7	7	7	7	7	6	6	7	7	7	6	6	7	7	7	1	1	7	7	7	7	7	7	5	3	3	3	6	7	7	6	5	6	6	7	5	68.3	95.2	1	1
14	6	6	6	6	6	6	6	6	4	4	6	6	4	6	6	6	6	6	6	1	2	7	5	5	5	4	6	2	4	3	6	6	6	5	4	4	5	3	5	3	58.7	81.0	1	2
15	6	6	6	6	6	6	6	6	6	5	6	6	5	4	6	6	4	2	6	2	2	6	3	5	6	6	6	3	2	6	2	5	5	2	3	3	5	6	2	3	53.2	77.8	1	2
16	6	5	5	6	5	5	6	6	5	6	5	5	6	5	5	6	5	5	6	1	1	5	6	6	4	6	3	6	3	5	4	5	6	5	6	5	6	4	5	6	56.4	77.0	1	1
17	3	6	3	5	7	7	6	6	6	2	3	6	6	6	6	3	6	6	3	1	1	6	2	3	4	4	2	6	2	2	2	5	6	4	3	3	2	3	6	6	51.6	73.8	1	1
18	2	3	1	3	7	7	7	6	6	1	2	5	4	4	2	4	6	5	5	1	2	7	2	6	7	6	7	4	4	3	4	4	6	5	5	6	7	6	7	4	65.9	59.5	1	2
19	5	6	5	6	7	7	7	7	6	4	6	7	5	6	6	5	7	6	6	1	1	6	6	6	5	5	4	4	6	4	5	5	6	5	5	5	3	4	6	4	65.1	85.7	1	1
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	2	6	3	5	6	6	3	2	2	5	2	7	5	5	3	3	2	2	2	2	51.6	85.7	1	2
21	6	6	6	5	6	6	6	6	6	6	6	6	6	5	6	5	6	6	6	1	2	6	5	5	5	6	4	3	5	5	5	5	5	3	6	6	5	3	6	6	59.5	82.5	1	2
22	5	5	5	3	5	5	5	4	5	5	5	5	5	4	5	3	5	5	5	1	2	6	5	5	3	5	5	3	2	5	3	5	5	3	3	7	2	5	6	6	50.0	66.7	1	2
23	6	6	5	4	4	5	6	7	6	5	5	6	5	4	6	6	5	7	7	1	2	7	5	4	6	3	6	3	6	3	6	3	3	5	7	4	5	7	6	5	3	6	56.4	77.8	1	2
24	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	1	2	7	6	6	6	6	6	6	2	3	4	5	6	6	5	6	6	3	6	6	64.3	85.7	1	2
25	5	5	4	5	4	5	4	5	4	5	4	5	5	4	5	5	5	5	5	1	1	5	5	3	2	6	5	4	5	3	3	5	3	3	5	5	4	4	3	5	56.4	66.7	1	1
26	6	5	6	6	5	5	6	6	5	6	6	5	6	5	6	4	6	6	6	1	2	6	2	5	3	5	2	3	5	3	2	6	5	3	3	5	5	1	6	6	49.2	79.4	1	2
27	4	3	6	3	6	3	5	3	6	3	5	3	3	6	3	3	3	6	7	1	1	7	3	2	2	6	6	2	6	6	6	5	6	6	4	5	5	2	6	3	56.4	58.7	1	1
28	6	7	6	6	6	6	6	6	7	7	5	6	4	6	6	7	6	6	6	1	1	5	2	5	3	4	3	2	2	6	6	4	4	3	2	4	3	3	5	2	54.8	86.5	1	1
29	6	6	6	7	7	7	6	6	6	5	6	6	6	6	6	6	6	6	6	1	1	6	5	6	6	6	4	4	5	6	6	5	6	6	5	6	6	5	6	4	61.9	87.3	1	1
30	6	6	6	4	3	6	5	5	5	6	6	6	6	5	5	5	4	6	6	1	1	7	6	7	6	6	7	5	2	5	5	7	7	6	2	6	6	6	6	6	65.9	74.6	1	1
31	5	6	6	6	6	6	6	5	6	3	5	4	6	6	6	6	6	5	5	1	2	6	4	5	6	3	5	5	4	2	3	5	5	4	3	4	5	2	3	4	57.1	78.6	1	2
32	7	6	7	5	7	3	4	7	7	7	7	7	7	7	7	6	4	4	7	1	1	7	1	1	1	1	1	1	1	7	7	1	7	1	1	1	1	7	1	1	42.9	86.5	1	1
33	6	3	5	4	6	4	6	3	4	6	6	3	5	5	4	6	4	6	3	1	1	3	5	4	2	4	6	3	6	2	3	6	7	5	3	5	4	5	7	2	62.7	68.3	1	1
34	5	5	5	5	5	5	5	4	5	4	5	6	6	6	6	4	4	5	5	1	2	3	5	5	5	5	5	5	4	5	6	5	5	6	6	5	5	5	5	6	61.1	71.4	1	2
35	2	7	3	2	6	6	6	6	6	5	6	6	6	5	6	5	6	5	7	1	1	7	6	6	6	6	6	4	6	4	3	6	6	6	5	6	6	3	5	5	62.7	74.6	1	1
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37	7	7	7	5	7	7	7	6	6	6	7	7	7	7	7	7	7	5	7	1	1	7	5	6	6	7	7	3	6	4	4	6	6	6	6	6	5	5	6	4	66.7	94.4	1	1
38	5	5	5	2	6	6	6	6	6	4	6	6	6	4	5	4	5	5	7	1	1	4	5	6	5	4	5	2	2	7	5	6	6	5	7	6	6	2	1	7	45.2	73.0	1	1
39	1	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	6	6	6	6	6	6	2	2	2	6	5	6	6	3	3	5	5	5	63.5	78.6	2	1
40	6	5	7	5	6	5	7	7	6	6	5	6	6	7	6	7	6	6	6	1	2	7	5	5	5	6	2	6	3	6	6	6	5	6	1	6	6	3	6	7	60.3	87.3	2	2
41	2	1	6	4	7	6	6	5	6	6	6	5	6	6	6	6	5	5	6	1	2	6	2	4	6	6	6	3	6	6	3	4	3	4	6	3	4	3	6	6	56.4	74.6	2	2
42	5	5	5	2	6	5	6	6	6	5	6	5	3	6	5	3	6	4	6	1	2	6	2	4	4	7	4	4	7	4	4	4	6	6	4	6	6	3	5	7	57.9	70.6	2	2
43	6	6	6	4	4	7	6	6	6	6	6	6	6	6	6	6	4	6	5	1	2	5	4	4	3	4	3	1	3	4	4	5	4	6	2	4	2	2	3	5	53.2	81.8	2	2
44	6	6	6	6	4	6	6	6	6	5	6	6	6	6	6	6	6	4	5	1	2	4	4	5	5	5	5	4	3	5	5	7	6	5	5	5	4	1	5	5	54.0	81.8	2	2
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46	6	6	6	6	6	6	6	6	6	5	6	5	6	5	6	5	4	4	7	1	1	7	5	4	5	5	6	3	5	4	3	4	5	5	3	4	6	5	2	3	59.5	79.4	2	1
47	4	6	6	6	6	6	6	7	6	4	5	5	5	6	5	6	5	6	6	1	1	6	6	6	2	3	4	2	7	5	4	5	3	6	4	4	6	2	2	6	53.2	79.4	2	1
48	5	5	6	6	7	7	7	5	5	4	5	6	5	4	5	5	5	5	6	1	1	7	5	6	6	6	5	4	3	5	4	6	6	5	4	5	5	5	3	5	58.7	77.0	2	1
49	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	5	6	6	3	2	6	2	2	2	5	6	6	6	3	6	2	3	4	51.6	85.7	2	1
50	5	7	6	3	5	5	5	5	6	5	6	5	6	6	5	6	5	5	5	1	2	7	5	6	6	7	7	4	7	7	6	4	6	7	6	4	5	6	7	5	69.1	76.2	2	2
51	4	5	4	5	5	5	5	5	4	4	5	5	5	4	5	5	5	5	5	1	2	7	4	6	6	5	2	5	5	3	3	4	7	7	5	6	6	4	5	5	60.3	67.5	2	2
52	7	6	6	4	5	6	4	5	5	3	5	5	5	4	5	6	5	4	7	1	2	6	3	4	5	2	3	5	4	6	3	5	4	5	4	6	2	3	2	7	51.6	71.4	2	2
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54	6	6	6	5	6	6	6	6	5	5	6	6	5	6	6	6	6	5	5	1	1	6	6	6	5	6	4	2	3	3	4	6	5	4	4	5	6	5	4	4	58.7	81.8	2	1
55	3	6	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	1	2	4	5	5	5	4	5	4	4	4	3	5	5	4	5	4	5	6	5	5	61.1	78.6	2	2
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57	7	6	6	5	7	7	6	6	7	6	6	7	6	6	6	5	5	5	6	1	1	7	6	6	6	6	6	3	3	3	6	6	6	5	6	2	6	6	4	69.8	86.5	2	1
58	7	6	6	4	7	6	6	5	5	4	7	7	7	7	6	5	7	4	7	1	1	7	2	5	4	5	5	2	2	4	3	4	6	6	6	7	3	5	4	5	55.6	84.1	2	1
59	6	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	1	1	6	4	4	6	3	3	2	2	2	2	4	5	5	4	3	5	3	3	5	50.0	84.1	2	1
60	6	6	6	6	5	5	6	6	5	5	5	5	5	5	5	5	5	6	6	1	2	6	3	5	6	2	6	4	4	5	3	4	6	6	4	4	2	2	5	4	57.9	77.0	2	2
61	6	6	6	6	5	6	6	6	6	6	6	6	6	4	4	5	5	5	5	1	2	5	3	4	4	4	4	3	4	4	4	5	4	4	4	3	6	4	5	7	57.1	79.4	2	2
62	5	5	6	3	6	6	5	5	6	6	5	5	5	6	6	5	5	6	5	1	2	6	5	5	5	6	5	3	6	6	5	3	2	5	5	2	5	6	6	5	64.3	75.4	2	2
63	6	6	5	6	7	6	6	5	6	3	6	6	6	6	6	5	6	6	7	1	2	7	6	4	5	2	5	3	6	6	5	6	5	2	5	2	6	3	4	62.7	81.8	1	2
64	7	7	7	7	7	7	6	6	6	6	6	6	7	7	7	4	4	6	7	2	1	7	7	5	7	7	4	5	4	3	1	5	7	5	6	4	7	3	7	5	58.7	88.9	2	1
65	7	6	7	6	7	7	6	6	5	6	6	7	6	6	7	5	7	5	7	1	2	7	7	3	4	5	5	3	3	3	4	5	5	6	5	4	3	5	6	5	61.1	88.9	2	2
66	4	4	4	4	4	5	5	5	6	6	6	6	5	6	7	6	6	6	5	1	1	7	5	6	7	4	5	5	2	3	4	5	6	4	6	5	4	5	5	3	61.9	75.4	2	1
67	6	6	6	7	7	7	6	6	6	6	6	7	6	7	6	6	6	5	6	1	2	6	6	6	5	6	6	6	6	2	2	6	6	6	5	2	6	6	6	6	60.3	88.9	1	2
68	7	7	7	5	7	7	7	7	7	5	7	7	7	6	7	7	7	6	7	1	1	7	6	7	6	6	6	6	3	7	6	6	6	6	4	6	6	5	6	7	64.3	95.2	2	1
Mean	5.5	5.6	5.6	5.2	5.9	5.9	5.9	5.7	5.8	5.1	5.7	5.7	5.7	5.6	5.7	5.3	5.6	5.4	6.0	1.0	1.5	6.1	4.6	5.1	5.1	5.0	4.8	4.1	4.0	4.2	4.0	5.3	5.4	5.3	4.4	4.7	4.8	3.9	4.8	4.9	59.1	80.2		
Std dev	1.4	1.2	1.2	1.3	1.0	1.0	0.7	0.9	0.8	1.2	1.0	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.2	0.5	1.0	1.4	1.2	1.4	1.5	1.5	1.5	1.7	1.5	1.4	0.9	1.2	1.2	1.4	1.3	1.4	1.5	1.7	1.4	5.9	9.1		
Min	1	1	1	2	3	3	4	3	3	1	2	3	3	3	2	3	3	2	3	1	1	3	1	1	1	1	1	1	1	1	1	3	1	2	1	1	2	1	1	1	42.9	54.8		
Max	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	2	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	7	7	69.8	100.0	1=business 2=accountin	1=male 2=female
																																								Count	1	40	32
																																									2	28	36
																																								Total		68	68