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Implementation of a content management system at the Stellenbosch University: an exploratory investigation

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STLDIA001

A dissertation submitted in fulfilment of the requirements for the award of the degree of
Master of Philosophy of Information and Library Studies

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced according to **APA 6th** edition.

Signature:

Signed by candidate

Date: 21 August 2012

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To my family, especially my beloved parents,
for their fervent prayers, and unfailing love and support.

Psalm 37:5 *“Commit thy way unto the LORD; trust also in him; and he shall bring it to pass.”*

(King James Version)

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ABSTRACT

This dissertation reports on an exploratory investigation into the implementation of an enterprise content management system for the Stellenbosch University, one of four higher education institutions in the Western Cape, South Africa. The primary focus of this study was to conduct a needs-analysis of how the University could effectively address the website and portal information needs of its users through the implementation of a content management system. This study sought to understand the current perspectives and information needs of users of the university's corporate website, as well as the staff and student portals, and to propose ways in which the University can manage its content assets to address these needs. More specifically, the question asked was: How Stellenbosch University could address the information needs of its users by implementing a content management system?

Interviews and questionnaires were used as primary sources of data collection. A total number of 116 staff and 209 student questionnaires were completed. The analysis of the data showed that, although staff and student users were satisfied with the information currently available from the various portals and websites, specific user groups had distinct preferences for certain types of information. It was clear that undergraduates considered it important to have access to information pertaining to taught courses, such as class allocations, and tests and examinations, while their postgraduate counterparts considered it more important to have access to their academic history, research and other official documents. Likewise, undergraduate students showed a greater preference than postgraduate students for social media and mobile computing as communication vehicles with the University. Clear differences emerged between academic / research staff and administrative staff. Predictably, the focus of the former was on portal use that supported their teaching, research and student interaction activities.

The overall results further indicated a lack of modernisation in the design of the portals and the importance of good information architecture to ensure an effective and user-centric content management solution. Pertinent comments and criticism that were made during the interviews indicate that the current portals are cluttered, difficult to navigate and that the current search feature is ineffective. These opinions corroborate comments made by staff and students when they completed their questionnaires.

Recommendations that evolved from this study include the following: Points of criticism made by staff, students and stakeholders should be addressed; the University's content management

team should solicit representatives from all departments and divisions involved in records management, digital asset management, e-Communication and other forms of content management to co-ordinate, develop and upgrade content management technologies and to develop appropriate web strategies.

The characteristics and strategies of every university are unique, and similarly, various campus web portals will differ according to the aims and objectives of each university. The study therefore could be helpful to Stellenbosch University, with regard to the development and implementation of the various aspects of its content management system or similar technologies on campus. Moreover, the study could offer fruitful avenues for further research with reference to research at other higher education organisations to develop a model for best practices with regard to the implementation of content management systems at tertiary level. Thus, although the focus of the study was for the application at Stellenbosch University it is envisaged that the wider higher education community can benefit from the findings of the study.

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CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 Introduction

Technological advances in information management have seen a growth in literature on a range of disciplines related to information, knowledge, and content management. A study of the literature on these subjects indicated that they are highly interrelated and difficult to define. White (2005, p. xi) correctly portrays the boundaries between them as rather 'blurred'. Several studies, although often disparate in their understanding of terms, have therefore attempted to define the scope of these disciplines (Liebowitz, 2006; Orna, 2004).

Although an in-depth study of information and knowledge management is beyond the focus of this study, they are defined in order to address their relationship to content management. According to Orna (2004) information is what individuals 'transfer' their knowledge into when they communicate knowledge to other individuals. Orna (2004, p.9) further defines information management as "the acquiring, storing, and making accessible [of] information to maintain organisational knowledge in appropriate information resources".

Knowledge is what individuals acquire from their interaction with the world, including other individuals, and can be seen as the outcome of experience that has been organised and stored inside the human mind in a unique way (Orna, 2004). Thus, knowledge management is concerned with "what individuals who make up an organisation need to know, to act successfully in the organisation's interest and to manage systems and technology to support individuals in using their knowledge thereby promoting organisational learning" (Orna, 2004, p. 9-10). Boiko (2005) and Liebowitz (2006) further indicate the relationship between knowledge management and information technology.

The nature of information management and knowledge management is clearly inter- and multidisciplinary. This factor has resulted in the adaptation and development of various techniques, procedures and systems to support organisations in the "collection" and "connection" of information and knowledge (Liebowitz, 2008, p. 78).

Content, according to White (2005, p. 4) can be seen as 'granular' information and, in terms of a typical web environment, could include sources such as text, graphics, pictures, sounds, or data. Boiko (2005) sees content as raw information that has been given a usable form intended for

one or more purposes.¹ The significance thereof is found in the arrangement of its key functional form as well as its purpose, ease of use, procedures, and distinctiveness.

Despite the complexity in defining the various fields of study, the opportunities for the development of effective systems in support of organisational functions are immense. The Internet and its technologies have created a huge potential for organisations to set up their own websites, which has resulted in a fundamental change in the way that organisations do business. As information increased, so did the challenges web managers have faced in the growth of information that is published to company intranets, extranets and the Internet. Owners of websites have had to develop innovative ways to manage and keep up-to-date content that has expanded exponentially and grown in complexity.

1.2 Overview of the literature on content management

Boiko (2001) defines content management as a process whereby a match is found between what *you* have, and what *they* want, i.e. what the organisation has and what its definable audience(s) or clients want. More specifically, a content management system is responsible for the collection, management and publishing of chunks of information that are known as 'content components' (Boiko, 2005, p.86). In effect, information 'runs' through a collection system and turns into content components. A management system, which is similar to a database, stores these components. The publication system draws components out of the management system and turns them into publications as seen in the following figure.

In Boiko's (2005) view, content management can mean different things to different people. Rockley (cited in Boiko, 2005, p. 67) suggests that content management should be seen as more than the technology, that is, hardware and software and the selection and implementation of new technology. To ensure a successful content management system, the developers should also place strong emphasis on the people who form part of this process- the absence of stakeholder participation will inevitably 'weaken' the success of the project. Rockley (cited in Boiko, 2005, p. 67) thus defines content management as "a repeatable method of identifying all content requirements up front, creating consistently structured content for reuse, managing that content in a definitive source, and assembling content on demand to meet your customer's needs."

¹First defined by the now defunct web organisation *Content Watch*.

The study of the literature on types of content management systems has shown that various content management systems exist. These are often categorised according to the functions they intend to fulfil. Mescan (2004, p. 54-55) provides the following overview of the categories he has identified:

Web Content Management

These systems are typically associated with content management in broad terms and assist in the management of web content, but do not necessarily manage content for other media channels.

Digital Asset Management

These systems create central repositories for graphics, allowing them to be archived, searched and retrieved. They do not manage text.

Document Management

These systems were designed to manage whole documents rather than chunks of text.

Enterprise Content Management

These systems can be defined as a strategy rather than a solution.

Single-Source or Portal Content Management

These systems are also referred to as component-level content management. Content can be re-used and re-purposed to multiple media channels and is often associated with portal technology.

Mescan's outline of the various categories, to some extent, is limited as two key categories of content management, namely record management and knowledge management were not included. The International Organization for Standardization defines records management as the "efficient and systematic control of the creation, receipts, maintenance, use, and disposition of records." (cited in Ghering, Caruso, & Gift, 2010, p. 2). Records management, within the content management paradigm, can further be seen as the use of basic record management guidelines in digital format (Ghering, et al., 2010). According to the Gartner Group, knowledge management is seen as "a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers." (cited in Koenig, 2012). Within the content

management notion, Koenig (2012) perceives knowledge management as the “making of the organization's data and information available to the members of the organization through portals and with the use of content management systems.”

In a study by Augustyniak, Agüero and Finley (2005b), the authors discuss the interrelationship between the role of content management and corporate portals. They refer to content management as the ‘keystone’ of portal technology and believe the success or failure of corporate portals, and therefore also other content management components, can be attributed to the effectiveness of a content management strategy.

Reynolds and Koulopoulos (1999, cited by Dias, 2001, p. 273) outline the evolution of early web portal functional development as follows: Boolean searching, categorised navigation, personalisation and finally the integration of additional features that provide direct access to other specialised information and commercial worlds. The result of these developments has been that organisations have been able to more effectively manage, arrange and provide access to in-house information.

Portal technology terminology, as in many emerging technologies, has not been standardised and according to Dias (2001) various terms are used interchangeably by vendors, users and information technologists, such as ‘corporate portal’, ‘corporate information portal’, ‘business portal’, and ‘enterprise information portal’. He attributes the use of different terms as part of the vendor jargon that is employed to gain possible competitive advantage.

Shilakes and Tylman (1998, quoted by Dias, 2001, p. 274) had however, as early as 1998, already provided the following comprehensive definition of an ‘enterprise information portal’, “Enterprise information portals are applications that enable companies to unlock internally and externally stored information, and provide users a single gateway to personalized information needed to make informed business decisions.”

Portals have become an area of interest for many universities across the world. Campus or academic portals, as they are also called, present a number of opportunities for academic institutions to use these technologies to communicate and customise information, to facilitate teaching and learning and to connect with students and other parties interested in the environment (Li & Wood, 2005).

This study will predominantly focus on enterprise content management, which is an “integrated” approach to managing organisational information and thus addresses the strategies, tools and processes needed to manage content within an organisation (Smith & McKeen, 2003).

1.3 Rationale of the study

Tertiary education organisations generally function within decentralised environments with various services, divisions, and academic faculties that involve a range of processes such as large, complex websites and other information management solutions. Over the last ten years, these organisations have increasingly adopted and integrated e-technologies to manage content within their respective organisations. In 2001, the Gonzaga University, in an attempt to address the dissatisfaction of its users with the University’s website, launched a Committee to look into ways to improve their web presence. The Committee recommended to the University that it should adopt a web content management system. They argued that such a system would ensure that web pages are better organised and that the creation and control of content would be more effective (Powell & Gill, 2003). As part of a set of recommendations for choosing a content management system, Powell and Gill (2003) further recommend that implementation stakeholders should understand the needs of their audience to ensure that the correct choices are made with regard to design, navigation and architecture. A number of other universities have, in a similar vein conducted studies to determine users’ web content needs prior to the implementation of a content management system. Of significance to this investigation are the studies that were done at the University of Glasgow (Brys, 2004) and the Athabasca University, in Alberta, Canada (Stewart, Graham, & Terry, 2008).

From the above it is evident that the tertiary education environment has increasingly come to realise that by adopting appropriate content management systems they can more effectively meet their users’ information and more specifically their website needs. Universities in South Africa have, in line with international trends, also realised the importance of these factors and it is thus not surprising that the University of Stellenbosch is currently investigating how it can improve the way in which information is managed and disseminated throughout the university.

Stellenbosch University is one of four higher education institutions in the Western Cape. In 2010², the staff complement totalled 2755. Academic staff represented 32% of the total, administrative or technical staff, 59% and service workers, 9% of the staff population. In the

²Latest available figures at the time of the study.

same year, 27694 students enrolled at the University. The number of undergraduate students comprised 60% of the population, while postgraduate students represented 36%, and special students, 4% of the student population. In its stated aims and objectives, the University stresses its commitment to the development of high standards in research and teaching.

Concomitant with the student and staff growth, the University has over the last few decades had to cope with the exponential growth in (and complexity of) information and information technologies. As a result of these developments the Stellenbosch University recognised the need in the early 2000s to revisit the way in which information is managed and whether it was satisfying the diverse and growing needs of its various information user communities.

A consequence of these investigations was that the University launched initiatives to provide access to information via user-specific portals. Information technology is however not static and because of the changing environment of the information and content management domains, the University has become aware of the need to further investigate the adequacy of the current technologies in place and to establish if user needs are being met.

In line with these factors, the University's Communication and Liaison team, together with its Information Technology (IT) User Support group decided to initiate an investigation into ways to enhance the management of information on the various web portals and the corporate website. A committee, known as the Portal Committee, was thus established in 2001 to coordinate the user portal developments and in a wider context to oversee the implementation of an overall content management system at the University.

The growing worldwide impetus in the tertiary education environment, as well as the local need at the University of Stellenbosch thus provided the motivation to conduct this investigation, i.e. to establish users' perceptions and underlying information needs with regard to the various portals and websites at Stellenbosch University and to relate these to implementing an effective content management system.

1.4 Research problem, objectives and research questions

The discussion in the previous sections has indicated that a critical area of concern for any tertiary education institution is to determine how the website and portal information needs of its students and staff can be addressed through the implementation of a content management system. Although it is acknowledged that this is a universal problem, this study will focus on a specific site of investigation, namely the Stellenbosch University.

The study will therefore set out to:

- investigate the information needs of the University's various user groups with regard to portals and websites currently available on campus to guide the implementation of a campus content management system,
- investigate what Stellenbosch University expects from its proposed new content management system, and
- provide possible guidelines with regard to developing of a content management system that could enhance the University's web presence and create a dynamic content management system.

To focus the study and address the problem and objectives outlined above, the following research questions were developed:

Main research question

How can the Stellenbosch University address the website and portal information needs of its users through the implementation of a content management system?

Secondary questions

What are the content needs of the various segments of users of the Stellenbosch University?

What strategies or policies should be in place for the effective implementation of a content management system?

What contribution does this study make to the tertiary education environment in general?

These research questions will thus be used as the research framework that will guide this investigation.

1.5 Scope

Librarians have traditionally concerned themselves with published resources and use various systems such as classification schemes, controlled vocabularies and catalogues to organise, categorise and provide access to these resources. Records managers in turn, specialise in the maintenance of records that support business functions. Knowledge managers are concerned with the study of knowledge as it resides within an organisation and how such knowledge can be utilised to accomplish organisational goals. Content management generally refers to an

overall process for collecting, managing, and publishing content to a specific outlet. The distinction between these fields is, however, no longer straightforward as they have, over time, moved closer together and are currently converging.

The scope of this study is mainly concerned with the practices within content management as it applies to the academic environment. Thus, how a content management presence can equip users with information to enable them to succeed in their study or work-related activities.

1.6 Research methodology

The study is based on an exploratory investigation into the implementation of a content management system at Stellenbosch University. The research approach consisted of a number of components that were integrated. The first step was to conduct a literature review of the field of study to obtain a better understanding of the conceptual issues underpinning the field of research and to identify the main factors that should be addressed by a content management system. This review was followed by a need analysis of the various staff and student communities' web portal information needs. The final component was the conduct of in-depth interviews with major content management stakeholders. The results from all three components were finally synthesised and integrated.

1.7 Significance of study

It is anticipated that the study will generate meaningful pointers to assist Stellenbosch University in developing a web content management strategy. It is further envisaged that the recommendations that evolve from the study would assist the University to implement a content management system that would enhance the current document and workflow management system and address the staff and students' needs.

Moreover, it is envisaged that insights gained from this study could have further application and that the wider higher education community could benefit from the findings and that the study could contribute to the academic discourse on content management system implementation processes.

1.8 Dissertation outline

The following is an outline of the chapters of the dissertation:

Chapter 1: Introduction to the study

The introduction provides the rationale of the study and an outline of the research objectives and questions.

Chapter 2: Importance of content management

This chapter provides a literature overview of content management as discipline and highlights the major components of content management.

Chapter 3: Content management implementation framework

In this chapter a framework for content management system implementation is set out and the processes involved with the implementation of content management systems within organisations is outlined.

Chapter 4: Landscape of the target organisation

In this chapter, an overview is provided of Stellenbosch University, the target organisation. The organisational mission, vision and goals, are outlined. This is followed by an analysis of the main issues in the strategic framework that relate to website and portal technologies at the university.

Chapter 5: Methodology

This chapter addresses the research methodology that was followed in the study to acquire an understanding of the perspectives and information needs of the users and stakeholders of the current website and portal environment at the University.

Chapter 6: Data analysis

In this chapter, the results of the questionnaires, interviews and document analysis are analysed in line with the research problem and objectives.

Chapter 7: Findings and recommendations

This chapter provides a summary of the findings of the study and offers recommendations which can serve as key areas to address when developing the content management strategy for the Stellenbosch University. In addition, it is indicated how the findings and recommendations of this study could influence further research on the evolving information needs of users and the implementation of content management and related technologies within higher education organisations in general.

CHAPTER 2

IMPORTANCE OF CONTENT MANAGEMENT

2.1 Introduction

Together with the exponential growth of websites, unstructured content in organisations have also grown and show no sign of deceleration of growth. In addition, innovation in internet technologies has caused a change in the way that people interact with the Web. Simply put, Internet users expect the “right” information to be available to them at the “right” time (Rockley et al., 2003, p. 3). It is thus clear that organisations that for the most part use static-based website technology could experience problems because of poor information architecture, version control, and information that is deeply embedded in databases and thus invisible to search engines. All of these factors could have a negative impact on findability and access to current or relevant information.

Within the university website landscape, content is often spread around various departmental servers or staff desktop computers and other mediums of storage. The dispersed nature of websites presents challenges to university web managers in addressing the expectations of users (cf. Chapter 4). In addition, the nature of content can vary considerably within the higher education environment. It can for example include data stored within records and other administrative processes, policy documents, guidelines and regulations, material available from teaching management systems (e.g. *Blackboard*), faculty yearbooks as well as data in audio-visual formats such as podcasts, images and video clips. To manage this diversity of content, higher education organisations are faced with decisions regarding the creation, managing and dissemination of content ranging from basic to complex content, often within the boundaries of legal or regulatory requirements. In an attempt to address these challenges, higher education organisations have thus implemented various software solutions such as content management systems (with various functionalities).

This chapter outlines the scope of content management and its core concepts. It thus provides important contextual background to enable the researcher to develop a structure for the phenomenon under investigation. Firstly, the researcher will describe the terms content and content management, as well as types of content management systems. In addition, the researcher will examine the broad processes, that is, the functions embedded in content management systems. Finally, the researcher will address the nature of enterprise content management systems in greater detail, as this relates to the focus of the research. In Chapter 3,

the researcher will investigate different frameworks for the implementation of content management systems. These could be applied to address the primary research question of how the Stellenbosch University can satisfy the website and portal information needs of its users by implementing an appropriate content management system.

2.2 What is content?

According to the *Oxford English Dictionary*, content can be defined as, “that which is contained” or “a table of contents, a summary of the matters contained in a book” (“content”, 2011). According to this definition, content is seen as “something” that “something else contains”. Within the content management landscape, thus, content is what is contained in a content management system.

Boiko (2005, p. 11) provides a succinct definition of content, in terms of content management systems, as information tagged with data that a computer can use to “organize and systematize its collection, management, and publishing.” In order to transform information into content (in this sense), it first needs to be categorised in terms of the context in and purpose for which it is used. Boiko (2005, p. 46) identifies five activities that play a major role in this process:

- deciding on the right type of information that matches the particular purpose of the organisation,
- deciding on the appropriate people required to process information,
- understanding the information available at present, or the information that ought to be created or purchased,
- finding ways to standardise information, thus ensuring that items that fit into the same class, adhere to the same basic structure, and
- finding ways to track and easily assemble information.

Boiko (2005) further suggests that content can be labelled as metadata, i.e. “data about data” since it creates context and meaning about information. Fundamentally, metadata can be linked to a specific audience or user type and can thus create “chunks” or subsets of content for the use of specific users, e.g., undergraduate or postgraduate students.

In an earlier study, David Marco (2000, cited in Rockley et al., 2003, p. 184) defined metadata as: “...all physical data (contained in software and other media) and knowledge (contained in employees and various media) from inside and outside an organization, including information about the physical data, technical and business processes, rules and constraints of the data, and structures of the data used by a corporation.”

Metadata is thus not only seen as data about data, but also as being used to illustrate the behaviour of data, processes, rules and structures. This description allows content management practitioners to expand their understanding of content to identify current use and future use, as well as how and when content will be delivered (Rockley et al. 2003).

2.3 Content silos

In the early days of corporate websites, web managers managed predominantly static websites through HTML³ editing. However, exponential growth in internet technologies towards the later 1990s has added to the complexity of website implementation. According to Moore (2001, cited in McKeever, 2003, p. 687), content is comparable to a feeder system for business processes. Consequently, traditional website content expanded to keep up with the expectations of users and this has resulted in organisations creating content to support their services and business processes.

Content can be seen as the “lifeblood” of an organisation (Rockley et al., 2003) and for this reason most departments within organisations create content. In the early days of website management information was sent to a web manager for moderation and uploading. This often created bottlenecks in updating websites and led to decentralisation as individual departments began to create their own websites (Powell & Gill, 2003).

However, this decentralised approach generated new problems which according to Rockley et al. (2003) included variations and iterations of content, multiple reviewing and costly translations, and different file structures and file names that complicated searching of content. In addition, authors then tend to work in isolation and erect walls around content areas. Rockley et al. (2003, p. 7) refer to this as “content silo traps”. They further state that most organisations do not create silos by choice. Such silos rather evolve as a result of pressure and a lack of awareness of what others are doing in the organisation. Content silos can have a negative effect on an organisation in terms of standardisation, consistency of content, cost of content creation, management and delivery, as well as quality and effectiveness of content, as well as whether it satisfies user needs.

To address these problems created by content silos Rockley et al. (2003, p. 14-15) recommend that organisations that are implementing content management systems develop content strategies to ensure that:

³ Hypertext markup language.

- authors spend less time authoring content,
- repetition is reduced and resources are better used,
- cost of content creation is reduced,
- content is consistently structured to increase readability and usability and thus improve quality and usability,
- authors can be more innovative and focus on creating content rather than concentrate on repetitive upgrading of content, and
- customer-satisfaction is increased by ensuring that they receive integrated and correct information at the right time in the format they require or prefer.

To conclude, the management of content silos within organisations is a challenge that most organisations have to face. This has specific application to this study since the various functionalities of content management systems, by their very nature, depend on the breakdown of silos as stakeholders on various levels need to be acknowledged and included in communications (cf. 2.6).

2.4 Defining content management

There has been much discourse on content management and its related subject fields. Academics, business analysts and software vendors have all contributed to the content management domain and given their perspective of the concept. The researcher has selected the following definitions as typifying the range of approaches that authors in the field have provided.

According to Hackos (2001, p. 9) content management is “about organizing, categorizing, and structuring information resources so that they can be stored, retrieved, published, and reused in multiple ways.” She translates this definition into practical terms by arguing that content management will only be successful if embedded in the ability to visualise the needs of users. This observation of Hackos is valuable as it engages the technical as well as user aspects. It further accommodates the re-use of information resources in multiple ways and thus takes into consideration challenges with regard to user needs and the distribution of content , e.g. whether paper-based, web-based, wireless devices, PDAs or mobile phones.

Nakano’s (2002, p. 33) definition of content management emphasises the synergy between its human and technical elements:

“...a discipline that manages the timely, accurate, collaborative, iterative, and reproducible development of a web property. It combines a mechanism to store

a collection of web assets with processes that seamlessly mesh the activities of people and machines within an organization.”

White (2005, p. xv) again defines content management as the manner in which content is dealt with in the general content management life cycle from its design to publication. Fundamentally, content advances from one phase within a content management system to the next. White thus stresses the importance of the content management life cycle as it encompasses the creation, reviewing, managing and delivering of content.

Boiko (2005) sees content management as a dynamic combination of different processes that means different things to different stakeholders. He (Boiko, 2005, p. 66-79) thus ‘defines’ content management in relation to what it can attain taking into consideration the different perspectives in an organisation:

- From a business goals perspective, content management distributes business values. Thus, the organisation should determine what information is of value and what it wants to deliver, e.g., in a university context, lecturers’ notes for students.
- From an analysis perspective, content management balances organisational forces. The interests and requirements of entities within an organisation may differ. Therefore, a content management system has to try to balance the varying and often incompatible needs of entities. These groups include audiences, authors as well as functions such as workflow, and access structures.
- From a professional perspective, content management combines content-related disciplines. Content management entails alliances of individuals from the following disciplines, business management, information architecture, engineering, content creators and publication developers. Thus, these role players form an integral part of content management.
- From a process perspective, content management collects, manages, and publishes information. Thus, content managers first create or acquire information and aggregate information into manageable chunks and allocate metadata. Secondly, content is kept in a repository (database) and finally, content components are extracted for publishing in different ways, e.g., learning portals.
- From a technical perspective, content management is a technical infrastructure. A content management system, according to most information technologists, is a

combination of hardware and software. Content management systems can comprise of static or dynamic websites. In addition, these technologies have their own set of advantages and disadvantages. Whereas static websites can be laborious to maintain, as updates are required for each page, dynamic websites may be less reliable, despite their advantage of personalising content per user type.

In a more recent study, Shaikh and Fegade (2012, p. 379) state that a content management system "...supports the creation, management, distribution, publishing, and discovery of corporate information." They further indicate that such systems cover the complete lifecycle of content, from its creation to its archiving.

It is clear from the aforementioned definitions of content management that content management is a complex issue for organisations to manage. Content management clearly does not only entail the technologies associated with content management systems, but also specifically incorporates the interrelationship between content management and the purpose of the organisation, as well as the relationship with stakeholders, users, and processes.

In the following section an overview of the common processes of content management systems, namely collect (create), manage (store) and publish (deliver) are outlined. These processes have been identified as being central to content management systems by a number of studies in the field (Boiko, 2005; Rockley et al., 2003; Shaikh & Fegade, 2012; White, 2005).

2.5 An outline of the major elements of content management systems

The following procedural outline of content management systems creates a point of reference of the overall content management landscape. This is an important factor to consider when developing and implementing broader enterprise content management strategies. A literature review, conducted by the researcher revealed various outlines of the major elements of a content management system (cf. Boiko, 2005; Lewis, 2012; Shaikh & Fegade, 2012). Notwithstanding the fact that Boiko's study was conducted in the mid-2000s, the analysis of the primary elements of content management systems is largely practical and provides an incisive overview of the fundamental components of content management systems and therefore applicable to this study.

2.5.1 Collection systems

According to Boiko (2005, p. 87-99) the collection elements of a content management system involves the processes content is exposed to before final publishing. These processes entail the following:

Authoring

This component provides an environment for authors to create new content. Authoring effectiveness can be enhanced by providing templates, workflow and version control features, as well as a clear purpose of the intended audience.

Acquisition

Content may also be obtained from external or existing sources. Boiko differentiates between syndication, where sources are designated for re-use and external sources, where files have been identified for inclusion.

Conversion

Information, whether created or acquired, may have to be converted if the structure is not compliant with the content management system. Therefore, unnecessary information, such as headers and footers, can be stripped to a standard supported by the content management system.

Aggregation

This process entails the grouping of diverse information into the general content management system through editing and metatorial⁴ processing. During this phase, information is divided into content components, edited according to organisational principles and fitted into standard metadata systems to ensure effective storage, retrieval and delivery of content as required.

Collection services

The common way for authors to enter content into a repository is to create content through web forms. Authors thus enter text and metadata, as well as other media, for upload to the content management repository. Content external to the system, such as *MS Office* documents, may also be uploaded. For this reason, templates can be created which will allow the author to enter metadata, which is compliant with the content management repository's requirements.

⁴Boiko (2005, p. 227) sees the role of a metator as someone who works with the information architecture staff to create a metatorial framework, thus to review content to assign metadata fields and train and guide other staff.

2.5.2 Managing systems

A management system is responsible for the storage of content components. The management system comprises the following traditional features: a repository, workflow, connections and the administration of the overall system (Boiko, 2005; Rockley et al., 2003).

Repository

The repository is the main element of the management system and consists of a set of content databases (standard relational or XML object databases), file directories and other system structures that store the content and control the configuration files. The configuration files typically comprise the input and publishing templates, rules files, meta information lists and other control files and structures (Boiko, 2005; Rockley et al., 2003).

Administration

The administration system is primarily responsible for the parameters and configuration of a content management system. This is where staff roles, permissions and access rights are assigned, as well as tasks relating to content types and workflow, and where it is ensured that hardware and software display content correctly.

Workflow

The workflow system is responsible for scheduling and enforcing staff tasks. Workflow follows a particular content component, such as a MS Word file, from creation (thus collection) until it is ready for publication. In the management component, workflow relates to the backup and archiving of content.

Connection

Content management systems need to interact with various other systems in organisations, thus an infrastructure needs to be in place for the management of local area networks and other information technology environments in the organisation.

2.5.3 Publishing systems

The publication system is primarily responsible for publishing content and other sources found in repositories and consists primarily of the following components (Boiko, 2005, p. 106-109):

Publishing templates

Templates are utilised by content management technologies as they provide built-in templates for publication of content. These templates may include static elements, thus, not needing any form of processing, and will direct publishing.

Publishing services

These services entail the personalisation and conversion of content, for example, in PDF format. They may call upon other services not available as standard content management elements and independent software may be called upon for processing.

Connections

Some organisations do not wish to store all data in content management systems, therefore, connections are often utilised to access data outside the sphere of content management and thus, connections are maintained with other applications.

Web publications

Web publishing is one of the most widely used functionalities of content management systems. Content may be published to the internet, intranets or other websites as users request information. In essence, a template is loaded and the necessary parameters (permissions, depth of content) are set in place. Hereafter content is passed back to the web server and subsequently displayed on the user's browser.

Other publications

Content display is not limited to web publishing only. Through syndication, content can be distributed and re-used in publications outside the current content management system. This facet of publishing is particularly important as advances in information-related technologies force content management developers to deliver content in a user-centric manner.

Boiko neatly synthesises all these aspects in the following schematic overview of a content management system. The diagram below illustrates the flow of raw information through the collection phase where it is converted into content components after which it is sent to the management system, i.e. the management repository, and then it finally moves to the publication phase:

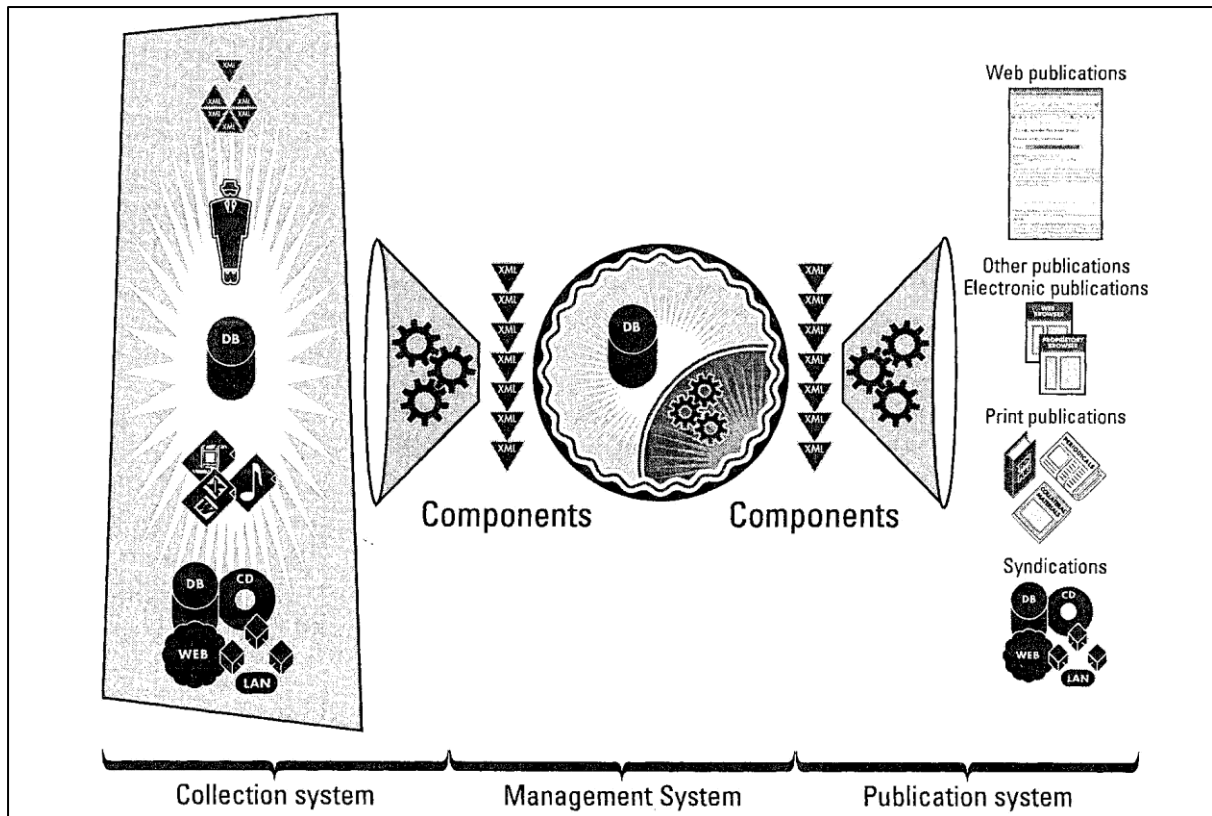


Figure 2.1: Schematic overview of a content management process (Source: Boiko, 2005, p. 86)

In a very similar way, Rockley et al. (2003, p. 312) describe the content management process as content that is produced in an authoring tool and subsequently saved into a content management repository. Content is saved into the repository as individual entities and the relevant metadata is added. Inside the repository, content is managed and controlled and delivered (published) to suitable mediums. Their systematic overview of the content management process (Figure 2.2.) thus shows many similarities to Boiko's (2005) schematic overview depicted above.

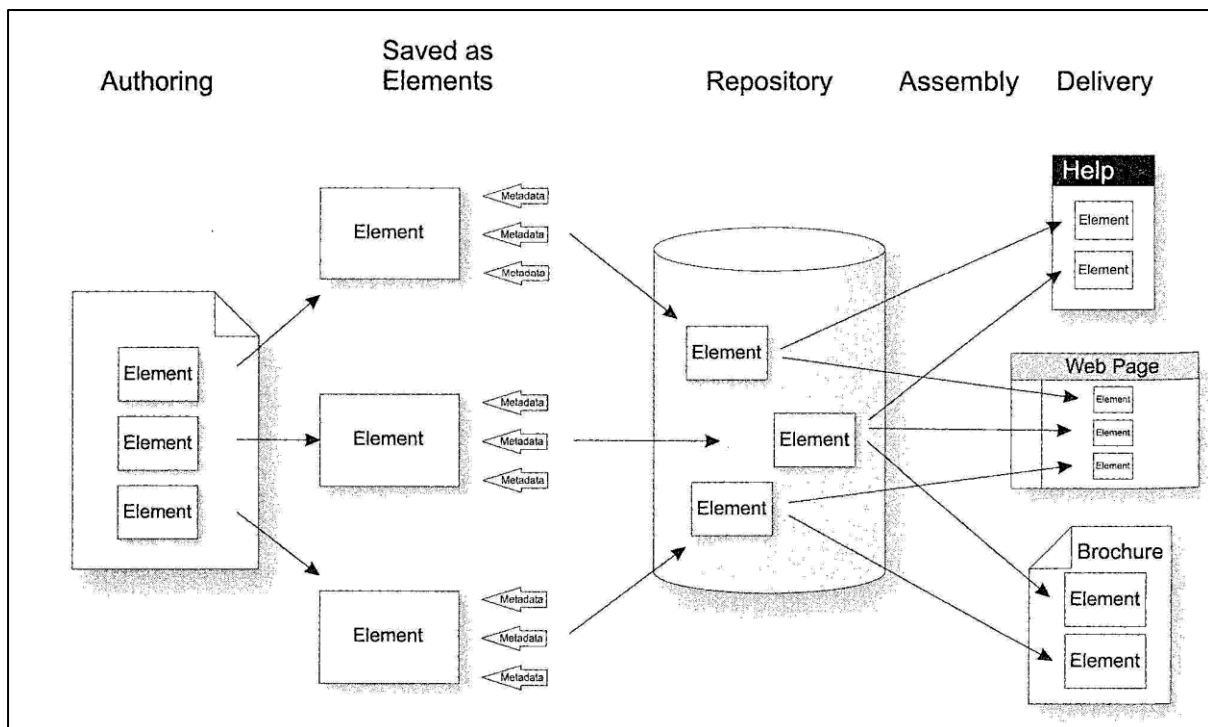


Figure 2.2: Content Management Process (Source: Rockley et al. 2003, p. 213)

Although Rockley et al. (2003) and Boiko (2005) provide a good and concise outline of the fundamental principles of the content management process, it should be noted that these are not exhaustive. Users are currently changing the way in which they interact with content, such as utilising the pervasive advances in the mobile phone and social network technologies (Elam, 2010).

The following section provides an overview of content management system types, with special emphasis on those of particular interest within the higher education environment, as identified in the literature.

2.6 Types of content management systems

Several authors in the content management field have attempted to outline the different branches of content management systems (Boiko, 2005; Gartner, 2010; Mescan, 2004; Rockley et al., 2003). However, the integration of content management and related technologies, as well as continuous advances in computer, mobile phone, communication and networking technologies, all add to the complexity of providing a truly exhaustive list. Having acknowledged this complexity, the following outline of the various systems is provided.

2.6.1 Web content management systems

A number of users and vendors within the content management landscape perceive the term content management to be synonymous with web content management systems. However, a web content management system's main function is to control and deliver content through the use of specific management tools which reside within a core repository, to the Web (Gartner, 2010). In some newer products, it can also deliver content to other wireless devices. According to Rockley et al. (2003), web content management software is mostly supportive of management content on an organisation's websites. Web content management software provides collaborative authoring, testing, templating, workflow and version control of content delivery to the Web and robust HTML or other web-based editors to create content (Gartner, 2010). Authoring is typically done in phases. Some features of software products include the ability to customise and personalise content aimed at specific users and the ability to monitor and control content when it becomes dated.

2.6.2 Integrated document management and record management systems

Two of the oldest technologies within the content management domain include document and record management systems and were originally designed to manage company documents and records (cf. Chapter 1). In universities, for example, these may include faculty handbooks and policies. Recent advances in content management technologies have enabled document management systems to accommodate chunks of content within documents and not only whole documents.

Thus, in academic institutions, theses, dissertations, faculty handbooks, but also images, video, other visual material and sound can form part of integrated document management systems. These systems also enable organisations that are bound by government regulations in terms of compliance to build a good audit trail of documents, thus adhering to the security and auditing requirements imposed by government. Document management interfaces are stable and thus have strong check-in/check-out features, as well as good quality version control, access control, workflow, archival and auditing functionalities (Gartner, 2010). However, some of the earlier generation technologies still utilise old interfaces and do not have the benefit of graphic user interface technology. Therefore, users of such systems may find it difficult to interact with the application. Older document management systems concentrate mostly on whole documents and granularity of content may be difficult to achieve (Rockley et al., 2003).

Record management according to Gartner (2010, p. 8) aims for the "long-term retention of content through automation and policies" within predefined policies and practices, which

adhere to legal, transactional and regulatory business related compliance. Thus, critical organisational documents are retained according to a set of principles according to a records retention plan.

2.6.3 Course content management and learning content management systems

Course management systems are online systems designed to support classroom learning in educational organisations (Carliner, 2005). Typical features include: online course material, quizzes and online tests, grade books, forums, and wikis. Examples of course management systems include *Blackboard* and *Moodle* (Carliner, 2005). As a result of the limitations of traditional course management systems, which include the limited capability to provide interactive e-learning, learning management systems have been developed to support training. Learning content management systems can be used to enhance e-learning (Carliner, 2005; Lust, Juarez Collazo, Elen, & Clarebout, 2012). They typically provide for student registration, track participation and completion of courses, aggregate reports and process changes of courses. Furthermore, learning content management systems were created to support web-based and other e-learning materials to manage learning content life cycles and other components of educational content. Learning content management systems therefore provide for the need to publish multimedia, such as text, graphics and other forms of media. An important feature is the possibility to enable the re-use and sharing of learning material, as most learning content management systems aspire to be SCORM⁵-compliant (Rockley et al, 2003). For this reason, this group of content management systems is specifically aimed at learning environments, which are closed environments. Some earlier examples include: *NetDimensionsEKP* and *SumTotalSystems* (Carliner, 2005).

2.6.4 Digital asset management systems

Digital asset management, according to Extensis (2011) is the “effective management and distribution of digital assets such as images, documents, creative file, audio and video clips. Furthermore, such systems, allow organisations to catalogue, store and retrieve collections of valuable digital assets. Some of the benefits of digital asset management include: centralisation of digital assets, protective storage of rare or valuable content, findability of digital assets, reduction of organisational costs, and the dynamic distribution of assets to internal and internal teams.

⁵ The acronym SCORM is used for a model known as Shareable Content Object Reference Model. In 1997, the Advanced Distributed Learning developed a reference model for standardisation of re-usable learning content. Most vendors endeavour to create SCORM-compliant software (Rockley, et al., 2003, p. 29).

Examples of the implementation of digital assets at higher education organisations are many and range from scientific data such as digital images of samples, digitisation of theses, possible digitisation of rare archival collections including photos and other formats to name but a few. It is thus important for higher education organisations to determine how digital solutions can be implemented effectively within its broader content management system to encourage accessibility with the various other branches of content management functionalities.

2.6.5 Knowledge management systems

In the most generic sense knowledge management systems can refer to any of the tools and techniques that support knowledge management practices in organisations, while in its narrower sense the concept refers to information technology systems that enhance knowledge management processes. The latter have been categorised by Saito, Umemoto and Ikeda (2007:109-110) into those systems that “facilitate knowledge discovery, dissemination, collaboration and capturing in repositories.” Specific systems can include groupware, document management systems, content management systems, learning management systems, expert systems, semantic networks, enterprise portals, simulation tools, and artificial intelligence.

Web 2.0⁶ technologies and social media applications have in recent years played significant roles in knowledge management system development, particularly in relation to knowledge collaboration. Whereas content managers formed a major part in the writing, collection, organisation and categorising of content, Web 2.0 technologies have enabled users to become far more active in creating and adding content themselves, examples include users adding content to blogs, or wikis, and by means of social networking sites such as LinkedIn (Solobak, 2007 as cited in Levy, 2009).

A study by Weldon (2012) reports on the application of a commercial enterprise content management system in the university libraries at the Towson University, University of Maryland and University of Alabama to assist information professionals to easily create and manage their own Web 2.0 environment. For example *Microsoft Office's SharePoint 2010* was used to create a document library, wiki page, announcements, calendar, surveys, a reference manual, and issue tracking system (Weldon, 2012, p. 24).

⁶Broadly defined by Musser and O'Reilly (2006, cited in Levy 2009) as “the business revolution in the computer industry caused by the move of the internet as platform, and an attempt to understand the rules for success on that new platform? Chief among those rules is this: Build applications that harness network effects to get better the more people use them.” Examples include: social media sites, user created websites.

According to Gartner (2010), this aspect of knowledge management is the fastest growing category within the enterprise content management paradigm and includes as mentioned above content types such as blogs, wikis, video, social media and other formats of online interactions, all of which have an impact on the way that organisations, especially higher education organisations, manage content.

2.6.6 Portals

Rockley et al. (2003) identify portals as delivery tools rather than a content management type that are websites that are used as gateways to specific web content and users are typically required to sign in, after which they can access personalised content. However, other authors, including Mescan (2004), refer to portals as a part of content management types, also known as single-source content management systems. Portals therefore

More specifically “an enterprise portal can be defined as a single point of access (SPOA) for the pooling, organizing, interacting, and distributing of organizational knowledge” (Järvelä, Kareinen, Pötry, & Fobugwe, 2012, p. 7). This definition encapsulates the main function of portals as single-source content management systems that act as gateways of specific content to specific user types. However, according to the Association for Information and Image Management (AIIM, 2011a), while portal applications are still one of the main drivers of content management solutions and adoptions, organisations are more and more choosing newer content management functionalities and information governance tools to manage and disseminate content.

2.6.7 Cloud computing systems

As higher education organisations seek ways to manage content more effectively, cloud computing offers an opportunity to provide great benefits to the content management discourse. According to Sultan (2010, p. 110), cloud computing, can briefly and non-technologically be defined as “clusters of distributed computers (largely vast data centers and server farms) which provide on-demand resources and services over a networked medium (usually the Internet).” Furthermore the term ‘cloud’ was inspired by illustrations which depicted remote environments as cloud images in order to conceal the complexity that lies behind them (Sultan, 2010). Cloud services include: full computer infrastructure, e.g. virtual computers, to applications such as office type applications. Major vendors, have already invested into cloud computing, such as *Google Apps* a messaging and collaboration cloud platforms provided by *Google* (Sultan, 2010).

Cloud computing, offers major possibilities for the higher education environment as students and staff have a wider range of access to email, malware detectors, special software to assist with the processing of data at affordable costs. Sultan (2010) further points out the successful use of cloud computing at the University of California at Berkeley, where cloud computing was utilised for their courses. This enabled the university to acquire a huge number of servers and the capacity they needed for all their courses within a few minutes. In the United Kingdom, various universities have adopted *Google Apps* as replacement to in-house email systems. Although some information technology departments are cautious about the security and privacy issues with regard to cloud computing, the earlier simple storage and retrieval storage facilities have already been replaced with more secure as well as more advanced functional applications, e.g. human resources and enterprise resources planning (Porter-Roth, 2012).

2.6.8 Component content management systems

Component content management systems aim to manage content at a granular level, specifically components of content, as an alternative to document level. Each component is typified as a single topic or notion (e.g. graph). Components are then assembled into multiple content types seen as components or traditional documents. Each component has a lifecycle that can be tracked as an individual or assembled component. Component content management systems have numerous benefits, e.g. content remains the same irrespective of reuse, there is less content to create, content is separate from format and this simplifies reuse and translation costs can be reduced for multiple language reuse (Rockley & Manning, 2010). In addition, component content management systems have infinite application within the tertiary environment as they can be used in marketing and learning endeavours, as part of the functionality of other systems (e.g. knowledge management, digital content management) or as separate systems (Rockley & Manning, 2010).

2.6.9 Enterprise content management systems

The term enterprise content management is used to refer to an integration of various information and content management solutions. This evolved out of advances in the late 1990s where document management solutions were modified to integrate standalone software such as word processing, spreadsheets, etc.

Commercial enterprise content management systems thus endeavour to support all functionalities within the content management landscape. Software vendors coined the term as they enhanced and characterised their products to encompass all the functionalities of older dispersed technologies, e.g. document management systems, in an attempt to gain competitive

advantage. However, within the academic realm, enterprise content management systems are viewed as a relatively new phenomenon and there is still a lack of consensus among scholars as to its meaning. Enterprise content management systems are discussed in greater detail in the following section.

2.7 Defining enterprise content management

According to Gartner (2010, p. 7), enterprise content management can be defined in terms of strategy or as software. If viewed from a strategy perspective, it can help organisations control their content, encourage collaboration and make information easier to share and find. However, as software, it consists of a set of capabilities and application for content life cycle management that interoperate and can be used separately.

According to Smith and Mckeen (2003, p. 648) the objective of enterprise content management systems is to combine the strategies, tools, processes and skills an organisation needs to manage all the information assets (regardless of type) of their life cycle. This concise definition is particularly important to this research project as it recognises the role of strategies, technology and individuals in managing information (content) in organisations. Mescan (2004) and O'Callaghan and Smits (2005), agree with this notion and see enterprise content management as a strategy rather than a solution, as it entails the interaction of people, processes and tools.

White (2005, p. xvii) in turn, sees enterprise content management systems as the integration of web content management systems with other applications, e.g., document management, records management and digital asset management. Kampffmeyer (2006) adopts a technological approach and views enterprise content management systems as a combination of various technologies and functionality, each valuable in their own way, however when combined they offer the full benefit of an enterprise-wide solution.

AIIM has over time refined these definitions and their current definition is, in the researchers view, the most comprehensive and inclusive of all definitions of enterprise content management found in the literature, viz.:

“the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. Enterprise content management tools and strategies allow the management of an organization's unstructured information, wherever that information exists” (AIIM, 2011b, para. 1).

Thus, enterprise content management, according to AIIM, encompasses the strategies and overall implementation of, for instance, document management, web content management, records management, component content management and digital asset management, and endeavours to manage the life cycle of content from creation to the assembling of content for publishing to various platforms to the archiving and disposal of content.

2.7.1 Enterprise content management elements

AIIM (2011b, para. 2) further outlines four elements of content that are seen as central to an evolving enterprise content management strategy: compliance, collaboration, continuity and cost.

Compliance

Compliance (AIIM, 2011b, para. 40) should be seen as an integrated process and not a once-off project. Strategies in terms of different content management processes, for example, the proper capturing, storing, managing and disposal of content, need to be addressed to comply with legal requirements.

Collaboration

Collaboration (AIIM, 2011b, para. 5) allows individuals to work together and covers areas such as authoring and the utilisation of technologies. Furthermore, collaboration allows individuals from various departments within an organisation with related areas of subject expertise to create content faster and more efficiently. Thus, collaborative tools allow individuals and teams to create information without the need to be in close proximity to each other.

AIIM (2011b, para. 5) identifies the following functionalities of collaboration:

- communication channel facilitation, which facilitates communication. for example, chat, instant messaging or white boarding,
- content lifecycle management, which manages content objects in a business process, and
- project facilitation, which organises the way individuals work toward a common goal.

However, AIIM (2011b) warns that collaboration can only be accomplished by constantly being aware of compliance requirements, e.g., records management and knowledge capture requirements.

Continuity

Continuity planning is the general strategy to guarantee that processes continue in the event of any disaster. According to AIIM (2011b, para. 7), disaster recovery is focused on getting an organisation's IT infrastructure operational again. Content is the lifeblood of most businesses and is embodied in electronic documents. It is thus important to protect content and enterprise content management technologies thus create centralised repositories where vital business information can reside.

Cost

According to AIIM (2011b, para. 6) the key to measuring the success of an enterprise content management strategy lies in the value that these technologies provide for an organisation.

Kampffmeyer (2006) identifies the following components of an enterprise content management system: Capture, Manage, Deliver, Store and Preservation. These components are supported by the following subcomponents: collaboration, records management, workflow and business process, management, document management and web content management (including single-source access found in portals). Enterprise content management software developers, according to Kampffmeyer (2006), are continuously adding functionalities to enhance their products and components may thus include enhancements in areas of information lifecycle management, document-related technologies, knowledge management, as well as learning content management, which is of particular importance to the study of content management within the higher education environment.

2.7.2 Enterprise content management benefits

Smith and McKeen (2003), in an attempt to determine how organisations develop enterprise content management strategies, organised a focus group meeting of expert knowledge managers from various organisations to discuss these factors. According to this group, the only reason that one would introduce an enterprise content management strategy is to improve outcome, i.e. how it can address an organisation's visions and goals. They further identified the following potential benefits of enterprise content management systems (Smith & McKeen, 2003, p. 649):

- simplification of forms and work processes,
- ease of navigation through corporate documents and materials,
- branding,
- reduced materials cost,

- time savings,
- improved access to information, and
- accuracy and currency of online information.

In a recent study Shaikh and Fegade (2012), in addition to listing similar benefits as those outlined above, add support for decentralised authoring, increased security, reduced duplication of information, greater capacity for growth and reduced site maintenance costs.

2.8 Enterprise content management systems within the academic landscape

It is evident from the discussion above that enterprise content management systems cover a broad content spectrum. It further follows that content management systems should provide for a broad range of features to address the content management needs of organisations as the amount of unstructured content grows.

These factors thus also have implications for the developers of academic websites, information portals and related technologies that have to contend with voluminous content in predominantly decentralised landscapes. To illustrate, academic organisations have to meet varying needs such as the expectations of current students for timelier information, of prospective students to update or trace their applications and of staff who have to meet deadlines in the processing of examination results and to access explicit and tacit knowledge.

In the literature review in Chapter 1, it was stated that enterprise content management systems rarely encompass all the technologies required to solve an organisation's content problems – although vendors often claim that their software can achieve this (Smith & McKeen, 2003). Therefore, a single enterprise content management suite may not succeed in addressing the unique and mainly decentralised environment of specific organisations.

It follows that academic organisations should provide guidelines, thus strategies, to govern and manage their content. It is thus suggested that the basic components that academic-type enterprise content management systems should include are portals or single-source features, learning content management features and web content management features.

In the study referred to in 2.7.2 of the practices of knowledge managers, it was found that while a top-down vision for enterprise content management is advantageous, most initiatives follow a bottom-up approach. The emphasis is then placed on the delivery of immediate benefits and on gaining support from senior management. Once this is achieved, the system can be expanded to

incorporate different branches of content management (Smith & McKeen, 2003). For instance, academic organisations could in a similar way integrate and enhance their enterprise content management endeavours to include other features than those outlined above, e.g., publication management for the publication of faculty handbooks or transactional content management to simplify applications and enrolment of students.

A good example of the application of enterprise content management systems within the academic landscape is that of the Athabasca University that has implemented such a system to manage its complex collection of content relating to student and staff data. This primarily arose out of its primary mission to provide distance education where it was important to not only provide electronic access to course and academic content, but also to institutional documents and records (Stewart et al., 2008).

2.9 Conclusion

This chapter provided an overview of the content management landscape. It addressed the traditional approaches to content management, such as document and web content management, but also enterprise content management as a discipline that has emerged to address the challenges of compliance, collaboration and costs. Chapter 3 will introduce a process-orientated framework that systematises the phases of content management implementation.

CHAPTER 3

CONTENT MANAGEMENT IMPLEMENTATION FRAMEWORK

“Without a content management strategy (CMS) there cannot be a content management system (CMS), and without a content management system (CMS) there is no point in implementing content management software (CMS). I have taken the view that, since you cannot have a CMS without a CMS without a CMS, I will use the acronym in a fairly cavalier way.”(White, 2005, p. xii)

3.1 Introduction

In Chapter 2 the researcher examined the scope of content management and its related technologies. This chapter focuses on the literature relating to the principles underlying a strategy to implement an enterprise content management system. Enterprise content management was seen to be a strategic organisational approach by Smith and McKeen (2003) who argue that enterprise content management entails the strategies, tools, processes and skills required in an organisation to manage its content capital.

3.2 Content management implementation framework

Owing to a prevailing shortage of academic research within the enterprise content management paradigm, Tyrvänen et al. (2006) have proposed four research perspectives that could stimulate such academic research, viz. those aspects that relate to content, technology, processes and the enterprise.

Research within the content paradigm focuses predominantly on the organisation and the identification of content. Research within the technology paradigm concentrates on hardware, software and standards required to facilitate the management of content (vomBrocke, Seidel, & Simons, 2010). Research with a process view entails the functioning of content lifecycle activities as relevant to the creating, managing and publishing of content. From an enterprise perspective, enterprise content management research addresses the economic context i.e. the business or legal aspects of implementation (vomBrocke et al., 2010).

In Figure 3.1 below vomBrocke et al. have diagrammatically conceptualised the four research perspectives outlined by Tyrvänen et al. (2006, p. 628).

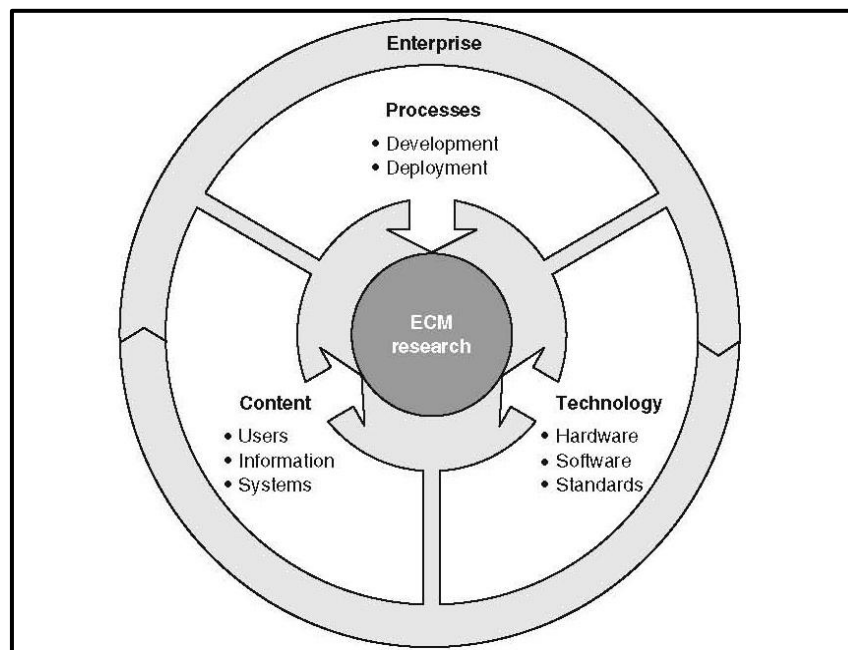


Figure 3.1: Framework of enterprise content management research
(Source: vomBrocke et al., 2010)

This framework is particularly important to this research project as it offers a conceptual structure for the research focus which, as stated previously, is to determine how Stellenbosch University can address the web portal information needs of its community through the implementation of a content management strategy. Despite the user-centric focus of the research, it was deemed necessary to provide an outline of the conceptual literature relating to the phased or process-orientated approach to the implementation of a content management system. This will assist the researcher to address the primary methodological approach of the study, i.e. assessment of user perceptions, and also the University's requirements in terms of its objectives and vision for the implementation of a content management system.

Within the content management landscape several authors support a process-orientated or phased approach to content management implementation (Augustyniak et al., 2005a; Augustyniak et al., 2005b; Asprey & Middleton, 2005; Boiko, 2005; Rockley et al., 2003; vomBrocke, Simons, & Clevon, 2011). They outline various phases within content management and its related subject domains.

A summary of these frameworks is outlined below:

Content management process frameworks	
VomBrocke et al. (2011)	<p>Phase 1 Business process analysis which typically entails the analysis of the conceptual specifications of an organisation's business processes.</p> <p>Phase 2 Analysis of the organisation's existing content (the use of attributes to specify content, e.g. a morphological framework.)</p> <p>Phase 3 Analysis of the appropriateness of available enterprise content management system functionalities that are in line with the organisation's specific needs.</p> <p>Phase 4 Through the business process analysis, analysis of content and the analysis of enterprise content management functionalities (Phases 1-3) the ECMS blue-print framework is informed. The ECM-blueprint (phase 4) illustrates how the content lifecycle activities (e.g. capturing, creating, editing, or archiving content) can be put into practice and are modified on the basis of the attribute values of content to an organisation's specific needs.</p> <p>Phase 5 The ECM-blueprint is incorporated into the existing business process structure. The implementation of enterprise content management systems might result in a change within workplace/workflow practices, especially with regard to the content lifecycle activities. This may require the re-assessment of existing business processes. Thus to justify the possibility of changing requirements in the management of content or business process, the framework exhibits a circular logic.</p>
Boiko (2005)	<p>Assess readiness</p> <ul style="list-style-type: none"> ▪ What mandate exists for a CMS? ▪ What audiences does the organisation expect to serve? ▪ What publications does the organisation expect to create? ▪ What content needs to be delivered? ▪ What other systems will be incorporated into the CMS? <p>Get a mandate</p> <p>Gather requirements</p> <p>Do logical design Get a clear idea of what your system must accomplish.</p> <p>Select hardware/software</p> <p>Implement system/ Process content/ Load and test content/ Train staff/ Perform maintenance</p>
Augustyniak et al. (2005a; 2005b)	<p>Portal vision</p> <ul style="list-style-type: none"> ▪ Mission statement ▪ Objectives ▪ Needs assessment ▪ Creative layout ▪ Benefits ▪ Funding ▪ Sponsorship <p>Content management strategy</p> <ul style="list-style-type: none"> ▪ Content inventory and analysis ▪ Content acquisition strategy ▪ Classification strategy ▪ Content management software specifications <p>Management framework</p> <ul style="list-style-type: none"> ▪ Portal role definition ▪ Prototype development strategy ▪ Resource requirements <p>Development and implementation strategies</p> <ul style="list-style-type: none"> ▪ Plans and schedules

	<ul style="list-style-type: none"> ▪ Evaluation ▪ Feedback 	
Asprey & Middleton (2005)	Phase 0 (Initiation, policy and strategy development, preliminaries, requirements and specifications, package selection.)	Phase 1 (Implementation, development, design, testing, implementation.)
	Project initiation & definition <ul style="list-style-type: none"> ▪ Scope ▪ Project organisation ▪ Communication and reporting ▪ Change strategy 	Implementation strategy/plan <ul style="list-style-type: none"> ▪ Scope ▪ Project organisation ▪ Review communication & reporting ▪ Review change strategy ▪ Installation plan
	Preliminaries <ul style="list-style-type: none"> ▪ Policy development ▪ Feasibility study ▪ Expression of interest 	Design & development <ul style="list-style-type: none"> ▪ Installation ▪ Requirements ▪ Prototyping ▪ Design ▪ Development
	Requirements analysis & definition <ul style="list-style-type: none"> ▪ User requirements ▪ Functional requirements ▪ Domain requirements ▪ Contract strategy & requirements ▪ Non-functional requirements 	Implementation <ul style="list-style-type: none"> ▪ System testing ▪ Integration testing ▪ Acceptance testing ▪ Data migration ▪ Training
	Package selection <ul style="list-style-type: none"> ▪ Request for proposal ▪ Evaluation plan ▪ Benchmark strategy ▪ Reference site strategy ▪ Business case ▪ Contract development 	Operations <ul style="list-style-type: none"> ▪ Go live support ▪ Operational support ▪ System manual ▪ Post implementation review
Rockley et al. (2003)	Analysis <ul style="list-style-type: none"> ▪ Identify the “pain” in your organisation ▪ Identify current content life cycle ▪ Conduct a content audit ▪ Formulate a vision for a new unified content life cycle 	
	Design <ul style="list-style-type: none"> ▪ Create information models ▪ Define metadata ▪ Design dynamic content ▪ Design dynamic workflow ▪ Develop organisational change management plan ▪ Define security model 	
	Tools and technologies <ul style="list-style-type: none"> ▪ Evaluate tools and technologies 	
	Develop <ul style="list-style-type: none"> ▪ Implement collaborative authoring ▪ Implement structured writing ▪ Address organisational change ▪ Implement design ▪ Install and configure hardware and software ▪ Create workflows in CMS ▪ Develop a prototype 	

	<p>Testing and system modifications</p> <ul style="list-style-type: none"> ▪ Conduct usability testing ▪ Conduct verification testing ▪ Revise specifications ▪ Implement system modifications ▪ Implement process modifications ▪ Implement workflow modifications
	<p>Pilot</p> <ul style="list-style-type: none"> ▪ Create a pilot plan ▪ Select and brief participants ▪ Install pilot and pilot server and participants' machines ▪ Develop preliminary training plan and materials ▪ Conduct pilot training ▪ Develop pilot user documentation ▪ Monitor pilot ▪ Revise specification ▪ Implement changes
	<p>Implementation</p> <ul style="list-style-type: none"> ▪ Develop rollout plan ▪ Develop final training plan and materials ▪ Conduct training ▪ Develop technical support plan ▪ Finalize user documentation ▪ Roll out solution
	<p>Post-implementation</p> <ul style="list-style-type: none"> ▪ Develop migration/upgrade plan ▪ Conduct post-project audit

Table 3.1: Process-orientated frameworks

From Table 3.1 it can be seen that there are a number of methodological approaches to content management system implementation. For the purpose of this research project a synthesis of the fundamentals of the early phases of the studies outlined in 3.2 will be used to assess the users' information needs as well as the organisational requirements with regard to the implementation of a content management system at Stellenbosch University. It is further clear from Table 3.1 that there are, despite the variety in approaches, a number of commonalities that can guide the researcher in developing a framework for the research. These aspects will be examined in the following section.

3.3 Needs assessment

The research problem addressed by this study is to identify the information needs of the users of Stellenbosch University as a means to establish what content should be published to the University's content management system. This focus on content rather than software selection or information modelling guided the development of a strategy or approach as part of the initial phase in the content management process.

According to Boiko (2005) and Rockley et al. (2003) an enterprise content management development process typically commences with a business justification phase which includes the mandate or justification and consensus of a plan of action to follow. Similarly, vomBrocke et al. (2011) recommend a business process analysis which typically entails the analysis of the conceptual specifications of an organisation's business processes. They thus consider it important to justify the need for a content management system by gaining an understanding of the organisation's business process, goals and needs and having the necessary authority and consent in terms a plan of action.

Together with this phase Boiko (2005) proposes a readiness assessment phase to identify potential sponsors or 'stakeholders' comprising representatives of management and those experts responsible for the implementation of the system. Similarly, Rockley et al. (2003) respectively refer to these initial phases of the process as the needs assessment or analysis phase. They further state that this phase is important to establish and address the needs of users of the content management system.

Augustyniak et al. (2005) therefore recommend that during the 'needs assessment' phase answers to the following questions should be obtained: What are our users' needs and what are the processes, information resources and technologies that need to be considered in the implementation process? Boiko (2005) again suggests that the following elements should be addressed during his 'assess readiness' phase (see Table 3.1): "What audiences does the organisation expect to serve?" "What publications does the organisation expect to create?" "What content needs to be delivered?" These questions clearly correlate with the fundamental elements of the needs assessment.

Equally important, Rockley et al. (2003) recommend an analysis phase as the first step in the content management system implementation framework. They thus propose that individuals involved with the content management implementation process identify the 'pain' in the organisation in order to formulate a vision for the implementation of a content management system.

These recommendations, as well as a case study conducted at *Statoil*⁷ (Munkvold et al., 2006), guided the researcher to conduct a needs assessment as the most sensible initial phase for the implementation of a content management programme at the Stellenbosch University. The *Statoil* case study identified a wide range of issues related to the management of content

⁷a Norwegian oil company.

through interviews with key participants related to the enterprise content management implementation process and this emphasised the importance of conducting a business process or needs analysis. Subsequent to the needs assessment, it is also important to identify the current content available to users and obtain an understanding of the current content life cycle and identify problems areas that could impede the successful implementation of a content management system.

3.4 Content audit

“I come across many websites where there is a well-designed top level content management system with quality content. However, when you click down a few levels, everything changes...” (McGovern, cited in Halvorson, 2010)

Rockley et al. (2003) define a content analysis as an account of the information available in an organisation. According to Halvorson (2010) a web content audit entails a full account of content available at a specific time on a website. An advantage of content audits is that they indicate to stakeholders the magnitude of content within an organisation.

Content audits may involve either a top-level or an in-depth analysis. Halvorson (2010) describes the top-level approach as a quantitative analysis and the in-depth approach as a qualitative analysis. A quantitative audit provides a broad overview of organisational content and is often the first step in an organisational content auditing project. This analysis can provide an overview of the following elements (Halvorson, 2010): available content, content organisation, content authors and content location.

A qualitative approach entails an analysis of the quality and effectiveness of content and may provide an overview of the following elements: the meaning of content, the accuracy of content, the usefulness of content, the use of content, quality of writing and user-friendliness of content (Halvorson, 2010).

Content audits are beneficial as they illuminate the scope of what content exists and thus address important aspects of content management systems such as the use, re-use, distribution and destruction of content, i.e. the content management life cycle (Rockley et al. 2003; Halvorson, 2010).

This research, however, did not undertake a content inventory of the University's websites or staff and student portals. This would have entailed a full analysis of the content of over 930

websites and portals. Instead, the researcher utilised a small-scale combination of the quantitative and qualitative approaches (Halverson, 2010) to review the organisation of content as well as to obtain a view of the extent to which staff and students consider it important to have access to specific links and sub-links from the staff and student portals respectively. (cf. Chapters 5 & 6).

3.5 Conclusion

This chapter provided an overview of the literature on the research perspectives within the content management paradigm. It further indicated how the process-orientated frameworks can be applied in the development of content management solutions and strategies as well as the design and implementation of a content management system. This enabled the researcher to determine a framework which would guide the conduct of the research for the study.

University of Cape Town

CHAPTER 4

THE ORGANISATIONAL LANDSCAPE OF THE STELLENBOSCH UNIVERSITY

The *raison d'être* of the University of Stellenbosch is to create and sustain, in commitment to the universitarian ideal of excellent scholarly and scientific practice, an environment in which knowledge can be discovered; can be shared; and can be applied to the benefit of the community (Stellenbosch University, 2010f, "Mission").

4.1 Introduction

Large amounts of disparate content within organisations have seen commercial organisations developing software solutions to provide for and adapt to the changing business environments of their clientele. Functionalities within software solutions constantly have to be adapted to address the organisational needs of a wide range of customers. Within the higher education landscape it is typical for universities to deal with a wide range of content which include learning management material, staff and student records, transactional records, meeting minutes, and digital information.

In this chapter an overview is given of the organisational landscape of the Stellenbosch University⁸ where the study was conducted. The rationale behind the overview is to provide an outline of the University in terms of its history, mission, vision and values and, in particular, the *Strategic Planning Framework*, as well as an overview of current website and portal technologies in place at the University, as these are seen as fundamental to the development of an enterprise content management system. This approach is supported by a study of Stewart et al. (2008), who reported on content management practices and strategies adopted at the Athabasca University in Alberta, Canada to manage complex collections of content. According to Stewart et al. (2008) the key success of a new content management system deployment depends on providing a clear vision of what needs to be accomplished when fully implemented. This motivated the researcher to give an overview of the organisational landscape of the Stellenbosch University and to specifically outline the functions of its Portal Committee and provide an overview of the diverse nature of its websites and portals. For these reasons, the University's website (<http://www.sun.ac.za>) and the staff (<http://my.sun.ac.za>) and student

⁸ Throughout the study, the target organisation will be referred to as "Stellenbosch University". The use of the abbreviations US, SU and Stell are discouraged as forms of corporate identity and "University" will be used for shorter options (Source: Stellenbosch University, 2010b).

(<http://mymaties.com>) information portals as well as personal communication with Ms. B. Kriel (Manager: Institutional Solutions) were used as key sources of information for this chapter.

4.2 Background

Stellenbosch University was established in 1918 when Victoria College was elevated to the status of a university (Stellenbosch University, 2010a). Since then the University's student numbers have grown from around 500 to 27 694 in 2010 (Stellenbosch University, 2010d).

The University has also expanded exponentially from the first 'faculty' grouping, i.e. an Arts Department to the current ten faculties. These faculties are the AgriSciences, Arts and Social Sciences, Economic and Management Sciences, Education, Engineering, Health Sciences, Law, Military Sciences, Science, and Theology. These faculties are located on campuses in Stellenbosch, Bellville and as far off as the coastal town of Saldanha (Stellenbosch University, 2010a). In addition, the University has over fifty (50) research units.

As a result of the diversity in terms of disciplines and its strong research focus, the University has developed into one of four outstanding research universities in South Africa. Overall, it has one of the country's highest number of postgraduate students and this accentuates the need for the University to continue to adapt and change in order to address the diverse needs of its students and to make a contribution to society as a whole. Over ten percent of postgraduate students are international students.

Lectures at the University are generally conducted in Afrikaans. It is the predominant language of undergraduate learning and instruction, but both Afrikaans and English are used in postgraduate instruction. However, in cases where the University does not have the capability to offer a service in the language of preference, English is the language of choice. For external communication Afrikaans, English and isiXhosa are, where possible, used (Stellenbosch University, 2010d). The range of study disciplines and the multilingual nature of teaching at the University create opportunities on the one hand, but, on the other, also challenges for the University to address the variety of users' information needs.

In 2009 the University developed a long-term vision as well as a set of values and overall commitments. This initiative was seen as a necessary initiative to ensure that the University could effectively fulfil its role as an international academic institution and direct research, develop innovative and relevant learning programmes and make an impact on the quality of the lives of people (Botman, 2009). In line with the vision and values of Stellenbosch University, the

rector indicated the University's commitment to devise an overall strategic plan to address the challenges it faced in the milieu of rapidly changing learning environments and the knowledge economy (Botman, 2009).

4.2.1 Strategic planning framework

Stellenbosch University, as part of its strategic plan, is conscious of the need for change within a rapidly changing international and local environment. Its management team therefore decided to focus on the following core issues in an attempt to reposition itself within the higher education environment (Stellenbosch University, 2010f):

- Information and knowledge are vital for economic growth,
- Increased internationalisation and technological advances affect the universal mobility of people,
- The international tendency to move towards participatory and flatter management structures, i.e. away from workplace "silos",
- The increasing need for diversity in disciplines on the one hand, and advances in specialisation on the other as the demand for new knowledge grows,
- The changing nature of students who see themselves as clients who insist on applied education, and
- Government requirements that statutory bodies improve accountability.

This self-renewal exercise resulted in the University developing various strategic indicators to ensure that it addressed its position within the South African higher education landscape. This process included the development of a content management strategy. For the purpose of the research, the mission, vision, commitments, values and core processes that form part of these indicators will be emphasized.

4.2.1.1 Vision

The vision statement of the University focuses specifically on research outputs and the pursuit of knowledge. It also aims to emphasise the need to contribute to the South African society and to concentrate its research efforts on specific key areas and to produce graduates that have critical thinking skills. The vision further focuses on the University's need to be innovative. (Stellenbosch University, 2010f, "Vision").

4.2.1.2 Commitments

The University recognises the historical connection it has to communities from which it originated along with its commitment to utilise knowledge and resources for the future benefit of the broader South African community. For this reason the University is committed to language-friendly interaction and sees Afrikaans as the language from which such interactions are launched (Stellenbosch University, 2010f, “Commitment”).

4.2.1.3 Values

Stellenbosch University identified nine values as part of the long-term strategic plan which underscore the need for the University to put systems in place to facilitate access to information and position itself as an organisation that seeks to serve. It further aims to be characterised for its emphasis on critical thinking and research, as well as its responsibility and accountability in terms of the broader community. The values of the University are briefly summarised as follows (Stellenbosch University, 2010f, “Values”):

Equity

To educate and enlighten students and staff from all demographic clusters.

Participation

Allow individuals participate in decisions the University makes and which could have an effect on them.

Transparency

The University strives towards clear decision-making.

Readiness to serve

To serve the interests of the broader community at local, national and international level.

Tolerance and mutual respect

To respect the viewpoints of various cultures and to create an environment of teaching which fosters tolerance.

Dedication

The University values dedication to work.

Scholarship

To create a teaching environment committed to critical thinking and good scientific practices.

Responsibility

The University understands the need to take into consideration its actions and the implications thereof and to be alert to the needs of the broader South African community and of the world in general.

Academic freedom

The University acknowledges its right to exercise academic freedom in a responsible way and opposes any form of unreasonable strictures.

4.2.1.4 Core processes

The University identified three core processes it deemed important in terms of the mission, vision and values of the strategic framework that outline the University's responsibilities (Stellenbosch University, 2010f, "The three core processes"). These core processes are:

- research,
- teaching and learning, and
- community service.

4.2.1.4.1 Research

The University acknowledges its role as a research-orientated organisation and seeks to educate quality researchers that are acknowledged as leaders in identified areas of strength. The University further seeks to create a strong research ethos and to provide the necessary support technologies – these include information technologies. It has further identified the need to advance "knowledge entrepreneurship" and to maintain a balance between basic and advanced or applied research (Stellenbosch University, 2010f, "The three core processes").

4.2.1.4.2 Teaching and learning

The University aims to be known for its quality teaching and therefore acknowledges the need to constantly renew and restructure its teaching and learning programmes. It seeks to address the specific teaching and learning as well as research needs that South Africa has. It also wants to be recognised internationally as a teaching and research organisation with a strong student-

focused culture that meets the demands of the information and knowledge society. In order to achieve this, the University has to have an appropriate content management strategy, technological aids and effective information systems which can facilitate and support teaching, learning and research efforts. The University further stresses the need for ongoing appraisal of student throughput and is of the view that access and accessibility are insufficient and that there should be a commitment to constant teaching and learning renewal (Stellenbosch University, 2010f, “The three core processes”).

4.2.1.4.3 Community Service

The University acknowledges its responsibility in society and sees interaction with the community as an important factor (Stellenbosch University, 2010f, “The three core processes”). The University defines its interaction with the community far more inclusively than merely being a philanthropic role. The community includes stakeholders such as trade and industry, potential employers as well as destitute clusters of society. The University endeavours to form partnerships with organisations outside the University and promote relationships and networking within the community. In addition, the University wishes to make an effort in the creation of jobs for its students. From a content management perspective this would mean that the University should not only create a web presence to address its internal clients, but also promote its external initiatives, relationships and its aspiration to network with others.

4.3 Staff and student profile

Stellenbosch University employs academic and administrative staff with diverse backgrounds and interests. In June 2010 the organisation had a total of 2 755 permanent employees (Stellenbosch University, 2010b).

Distribution of permanent staff for 2010 (June 2010 statistics)		% Distribution
Academic (Instruction/research)	891	32 %
Administrative/technical	1 624	59 %
Service workers	240	9 %
Total:	2 755	100 %

Table 4.1: Distribution of permanent staff

The distribution in 2009⁹ of academic staff across the University's ten faculties is outlined in Table 4.2.

Staff: Academic (2009)		% Distribution
Agrisciences	71	8 %
Arts and Social Sciences	157	18 %
Economic and Management Sciences	161	19 %
Education	44	5 %
Engineering	78	9 %
Health Sciences	111	13 %
Military Sciences	48	6 %
Law	30	4 %
Science	138	16 %
Theology	14	2 %
Total:	852	100 %

Table 4.2: Distribution of academic staff according to faculties

It can be seen from Table 4.3 that the support staff is similarly distributed over a range of departments and divisions. This further impacts on the need for effective and timely dissemination of information for decision-making purposes.

Staff: Support services (2009)		% Distribution
Executive-administrative	123	7 %
Specialist support	143	9 %
Administrative	839	51 %
Technical	256	16 %
Service staff	268	16 %
Artisans and craftsmen	12	1 %
Total:	1 641	100 %

Table 4.3: Distribution of support staff according to service category

⁹ A breakdown of staff according to employee affiliation was not available for 2010.

Table 4.4 indicates the student profile for 2010. These numbers had grown by 5% since 2009,¹⁰ to a total of 27 694 students, further emphasising the need for the University to effectively disseminate information to a rapidly growing student community (Stellenbosch University, 2010b).

Student enrolment for 2010		% Distribution
Undergraduate students	16 524	60 %
Postgraduate students	11170	40 %
Total	27694	100 %

Table 4.4: Distribution of student enrolment for 2010

4.4 Websites, sub-websites and portals

The University, at the time of this research project, managed 930 websites or sub-websites. The tabulation of the operating systems in use to support of these websites or portals is listed below in Table 4.5:

Websites, sub-websites & portals on Stellenbosch University's various operating systems (April 2011)		
Type of operating system	Number of websites/sub-websites or portals	% Distribution
Microsoft (2 server operating systems)	254	27%
Linux (2 server operating systems)	171	18 %
Oracle (1 server operating system)	88	9 %
Other servers - not maintained by the Information Technology Division	14	1 %
SharePoint (1 server operating system)	3	0.3 %
SharePoint (Intranet)	400	43 %
Total:	930	100 %

Table 4.5: Distribution of websites (including sub-websites) and portals by operating system, e.g. server

¹⁰Student enrolment for 2009 = 26 243

The University's websites operate within a highly decentralised environment and this diversity is portrayed by Table 4.6 below which outlines the departments and divisions responsible for the management of the various websites and portals:

Breakdown in terms of the management of websites & portals (April 2011)	
HTML technology	
Corporate website managed by Communication & Liaison	Corporate website at http://www.sun.ac.za
Alumni semi-portal managed by Communication & Liaison	Alumni website at http://www.matiesalumni.net
ORACLE portal technology	
Staff portal managed by Communication & Liaison	Staff portal at http://my.sun.ac.za
Student portal managed by Communication & Liaison	Student portal at http://www.mymaties.com
Hope project portal managed by Communication & Liaison	Hope project portal at http://www.thehopeproject.co.za
Portal managed by the Prospective Students Centre	Prospective students at http://www.maties.com
Portal managed by the Postgraduate Office	Postgraduate portal at http://www.sun.ac.za/postgrad
Portals managed by faculties	5
Portals managed by departments	Unknown
Portals managed by administrative divisions	8

Table 4.6: Distribution of websites and portals by technology type

In 2001 a portal project was launched at Stellenbosch University. It was named the e-Campus Initiative, and its core function was to create and provide portals for three distinctive university communities. These portals were meant to be user-centric and were organised to address the information needs of groups of users by creating a single point of entry to the University's web presence for each group. An alumni portal (<http://www.matiesalumni.net>) and a combined undergraduate and postgraduate student portal (<http://www.mymaties.com>) were launched in 2004, while the staff portal (<http://my.sun.ac.za>) was launched in 2006. In 2009 the University launched a mobile version of the student portal which is commonly known as *MyMaties Mobile*.

The successful launch of these portals was, however, not achieved without some difficulty. This situation is in fact not unique to the Stellenbosch University as can be seen from Katz's (2002)

comment that most portal initiatives are weighed down by implementation problems. In order to prevent these problems, he advises that it is important that all stakeholders of academic organisations should reach agreement on the portal approach and design to be adopted, but he warns that this is often hard to achieve in decentralised organisations such as academic institutions.

The Stellenbosch University acknowledged the need for a more structured and co-ordinated approach to address the concerns relating to its portal initiative, and a portal committee was instituted to ensure cross-institutional control and co-ordination of the University's web portals. This committee was charged with the responsibility of ensuring the sustainability and relevance of the portals, taking into consideration rapid and continuous technology advances.

The specific functions of the Portal Committee are as follows:

- co-ordinating portal activities, services and development,
- developing relevant portal policies,
- obtaining the participation of stakeholders and departments by ensuring the continued relevance, refinement and development of the portals,
- providing advice concerning portals to all university communities and management,
- monitoring usage and internalisation of portals as institutional tools,
- developing business plans and budgets regarding portals and instituting reporting mechanisms where necessary, and
- co-ordinating the development of further portals, e.g. mobile portals (Stellenbosch University, 2010d, "Information portals").

The committee is chaired by a staff member from the Information Technology (IT) Division who managed the original project. It comprises members of the initial project as well as mid-level managers within Information Technology, the Centre for Teaching & Learning, Interactive Telematic Services, Library and Information Services, Human Resources, Registrar's Office, the Advancement Office and e-Communications and the Postgraduate & International Office. A current concern that has been expressed is that the Portal Committee is challenged by matters arising from the University's strategic framework on the one hand and generic advances in information technology on the other (Stellenbosch University, 2010d, "Information portals").

One of the problems that have been identified is that the current student portal provides one common platform for both undergraduate and postgraduate student use. (Stellenbosch University, 2010d, "Information portals"). The needs of each of these student groups are in

many instances very divergent. For example many of the common links on the student portal are only applicable to one of the groups and this can lead to retrieval of totally irrelevant information. The different needs of the two groups have subsequently been recognised and a postgraduate platform that could support postgraduate students in their studies and research is envisaged. A further enhancement that is planned is to extend the current student portal infrastructure to incorporate the virtual research needs of postgraduate students, particularly those that are not resident students.

The Portal Committee are further aware of the pervasive impact of Web 2.0, as it “refers to the use of the Internet as a social tool and a service delivery mechanism” Barnatt (2010, p. 27) technologies and applications on portal design. Moreover, social networking and Web 2.0 communication channels and devices dominate the way the current student population communicates (Stellenbosch University, 2010d, “Information portals”). The question arose whether the learning and web platforms of the university should converge with or migrate to Web 2.0 systems and thus adapt to the preferred communication channels of its students. It is evident that the committee cannot simply replace its existing portal platforms, but needs to look at the role of portals within new technological settings such as advanced content management systems and also Web 2.0 applications. The University therefore concluded that it should not only develop a strategy and roadmap for the expansion and improvement of its current web presence, but also investigate the relevance of its portals, their compatibility with a workable learning management system and the newer technologies.

4.5 Conclusion

This chapter provides an overview of the organisation with regard to its history and background, its vision, commitments and core values. It highlights the areas to consider in the development of a content management strategy that is aligned to the University’s strategic plan.

It is the researcher’s view that it is important that the core initiatives outlined in the strategic plan be taken seriously and incorporated in the development of a content management strategy. Those persons who are involved in its implementation should further adhere to the parameters stipulated in the strategic plan. The following chapter will outline the research approaches and methodology used for the study.

CHAPTER 5

METHODOLOGY

5.1 Introduction

The research was based on a triangulated approach as it was anticipated that it would enhance reliability and validity and thus provide credible answers to the research questions as outlined in Chapter 1. It therefore integrated quantitative and qualitative data collection and analysis methods. Its aim was to explore content management initiatives at Stellenbosch University by utilising staff and student questionnaires. Interviews were also conducted with content management system stakeholders to collect primary data. The researcher's choice of research methodology was influenced by an in-depth study of the literature on content management systems, (cf. Chapter 1; Chapter 2), as well as information obtained by means of external assistance.

5.2 Research methodology

According to Leedy and Ormrod (2010, p. 2) research is a "systematic process of collecting, analysing, and interpreting information (data)". This process assists the academic researcher to obtain a better perspective of a phenomenon under study.

According to Babbie and Mouton (2005, p. 72), empirical social research should conform to a standard logic and follow a predetermined structure consisting of four phases. This structure, known as the ProDEC framework, is well known to researchers within the social research sphere.

The four elements of the framework are summarised as follows:

- a research problem (Pro),
- a research design (D),
- empirical evidence (E), and
- conclusion (C).

For the purpose of the research, the framework of Babbie and Mouton (2005) will be used as a broad framework of the research process. The first two elements namely, the research problem and research design will be addressed in this chapter, while the empirical evidence and conclusion, will be addressed in the chapters on the data analysis, findings and recommendations (cf. Chapter 6 & Chapter 7).

In addition, it is equally important to consider the general methodology that comprises the design, namely, the purpose and general approach to be followed in the study, before contemplating the more specific research problem and design. The discourse on methodology and methods within social research is varied and researchers have often been ambivalent in their understanding of research methods or tools and how these should be distinguished from research methodology. For example, Bailey (1994) equates research methodology to the perspective that encompasses the whole research process. This view is supported by Payne and Payne (2004, p. 148) who observe that the term methodology is indicative of the “philosophical assumptions”, whereas methods or tools are indicative of the specific techniques used by the researcher. For the purpose of the research, the researcher will adhere to these viewpoints in order to distinguish between the terms methodology and research methods.

5.2.1 Purpose

When studying a phenomenon by means of the ProDEC framework, a researcher ought to be guided by the research problem to establish which line of investigation to follow. Thus, the researcher needs to distinguish the type of question(s) that are used in research, as well as the purpose of the particular study. According to Babbie and Mouton (2005, p. 75) two key question types can be identified: empirical questions that deal with a “real-life problem” in which the researcher analyses new or existing data about the phenomenon under study and non-empirical questions that are about “entities”, which typically address the “meaning of scientific concepts or trends in scholarship.”

Babbie and Mouton (2005) further underline the importance of clearly indicating the purpose of the study and refer specifically to exploratory, explanatory and descriptive study purposes. Babbie and Mouton (2005) illustrate these three goals in the form of questions that provide a clearer notion of this concept, e.g., Is the purpose of the research to describe, to provide explanation, or to predict, or is the goal exploratory?

Exploratory survey research, according to Babbie (1990, p. 53), acts as a “search device” to initiate inquiry into a particular phenomenon. Thus, exploratory research aims to “investigate” somewhat unknown or new study areas and attempts to obtain new understanding of the phenomenon being investigated. Furthermore, exploratory research designs typically address “how”, “why” and “what” questions, while the most important aim of explanatory research is to explain given phenomena in terms of “specific causes”, that is, to point towards causality between variables or events (Mouton & Marais, 1996, p. 45).

Descriptive survey research is concerned with the study of populations where the researcher wishes to make descriptive assertions, thus to ascertain the distribution of attributes. Mouton and Marais (1996, p. 43) further see descriptive research as the comprehensive description of a specific organisation or social entity. Therefore, the main purpose is to give a description, rather than to explain (Babbie, 1990). Furthermore, according to Wisker (2001), descriptive research frequently addresses the phenomenon only for a specific instance and consequently the description might have to be replicated to note possible differences to the previous study; “what?” questions rather than “why?” questions apply and they address the situation, but not necessarily the causes.

In this study, the researcher has chosen to follow an exploratory investigation, as the aim is to investigate how Stellenbosch University can address its users’ need for information from its websites and portals through the implementation of a content management system. Thus, the key question relevant to this study and research mode is as follows: How can the Stellenbosch University address the website and portal information needs of its users through the implementation of a content management system?

5.2.2 Approach

Two philosophical assumptions or approaches generally guide social research methodology and act as the basis against which claims can be evaluated (Dale, 2003; Payne & Payne 2004). The two broadly recognised methodological paradigms in social research are referred to as the quantitative and qualitative research approaches.

Quantitative research, as the name indicates, is concerned with the numerical measurement of phenomena, whereas qualitative research is based on intensive research into the features of the phenomena. The latter seeks to build understanding by depth investigation rather than by condensing information (Daly, 2003). This perspective on the two research approaches is also supported by Leedy and Ormrod (2010, p. 94) who typify quantitative research as looking at numbers, or “quantities” of variables under study, and qualitative research as the study of features, or “qualities” of the particular phenomenon being studied.

Therefore, research using a quantitative approach is concerned with measuring the “properties” of phenomena through quantitative measurements and these measurement techniques might vary from measures of the “physical world” to developed measures of “psychological

characteristics or behaviour, e.g. tests, questionnaires and rating scales (Babbie & Mouton, 2005, p. 49).

In turn, research utilising a qualitative approach studies the intricacies of a specific phenomenon and could relate to human circumstances or the study of other animal species. The researcher thus follows an insider perspective, also referred to as the “emic” perspective (Babbie & Mouton, 2005, p.53) and the research is thus more concerned with understanding ‘*verstehen*’ than explaining human behaviour.

Notwithstanding these distinctive differences, both approaches, according to Leedy and Ormrod (2010), could make use of similar research processes, e.g. the development of hypotheses, the study of relevant literature, and the gathering, studying, and analysis of information. Reid and Smith (1981), as cited in Fouché and Delpont (2002), provide the following very relevant outline of the nature of the quantitative and qualitative approaches:

Quantitative approach

- The role of the researcher is to observe objectively.
- The focal point of research is on explicit questions or hypotheses.
- Questions and hypotheses remain unvarying throughout the study.
- Data gathering methods and categories of measurement are created in advance of the study and used in a standardised way.
- Data collectors ought to steer away from their own illuminations.
- Statistical methods are used to determine any significant associations between variables.

Qualitative approach

- The researcher aims to gain an understanding of a phenomenon of interest by means of a research design and data collection.
- Data collection techniques such as interviewing are used to acquire an understanding of the phenomenon under investigation.
- Qualitative methodology therefore is based on the assumption that an understanding can be gained through accumulated knowledge acquired by an individual researcher.

In many instances researchers have to investigate complex social phenomena and to make sense of the complexity of these situations they frequently employ a mixed-method approach (also known as ‘triangulation’), rather than to use either quantitative or qualitative methods.

The triangulated approach chosen for the research is defined by one of its architects, Denzin (1978, quoted in Babbie & Mouton, 2005, p. 275) as:

...a plan of action that will raise sociologists [and other social science researchers] above the personal biases that stem from single methodologies. By combining methods and investigators in the same study, observers can partially overcome the deficiencies that flow from one investigator or method.

Hence, the central premise of triangulation is to overcome deficiencies or limitations inherent of specific research methods when only one method is used to investigate a phenomenon. Leedy and Ormrod (2010, p. 99) also support this notion, by assenting that through a triangulated approach, researchers could increase the probability that their explanations are the “most likely” for the observations made. Therefore, by following this research strategy, the combination of more than one approach could mean that the weaknesses of an approach are cancelled by the strengths of the other. Triangulation is thus likely to increase the level of objectivity, reliability and validity of a study (Greene, Caracelli, & Graham, 1989; Leedy & Ormrod, 2010; Mouton & Marais, 1990).

Traditionally, methodological triangulation can take two forms, known as between-method triangulation (entails the utilisation of quantitative and qualitative approaches), and within-method triangulation (entails the utilisation of either multiple quantitative or multiple qualitative approaches), Denzin (1978, cited in Johnson, et al., 2007). According to Denzin (1978, cited in Johnson, et al., 2007, p. 115), the between-method approach is seen as more advantageous, as the combination of mixed methods in this sense as “the result will be a convergence upon the truth about some social phenomenon.” Morse (1991, cited in Johnson et al., 2007) on the other hand, listed two types of methodological approaches that are linked to the timeframe of a study, viz.: simultaneous or sequential triangulation. In the case of simultaneous triangulation, the researcher employs qualitative and quantitative methods with small-scale interaction between the two sources, in sequential triangulation, the results of one approach inform the planning of the next phase.

For the purpose of this study, the researcher has opted to utilise the between-method triangulation approach within a simultaneous timeframe. Both quantitative (questionnaires) and qualitative (personal interviews) research techniques will be used to collect data from a randomly selected sample in an attempt to obtain an understanding of the Stellenbosch University staff and student communities’ web portal information needs.

5.3 Research problem

According to Babbie and Mouton (2005), the research methods that a researcher employs in a study, as well as the succession in which they are used, depend greatly on the research problem and the type of evidence that is needed to deal with the problem. They therefore stress the importance of distinguishing between different research questions (Babbie & Mouton, 2005, p. 75). For example empirical questions address “real-life” problems and existing data are analysed, whereas non-empirical questions address the significance of “scientific concepts”. For the purpose of this study, the researcher has chosen empirical research questions to investigate the need of the Stellenbosch University students and staff for information from the university’s websites and portals. The main and subsidiary research questions that evolved from the problem as discussed in Chapter 1 are outlined below:

Main research question

How can the Stellenbosch University address the website and portal information needs of its users through the implementation of a content management system?

Secondary questions

What are the content needs of the various segments of users of the Stellenbosch University?

What strategies or policies should be in place for the effective implementation of a content management system?

5.4 Research design

Babbie and Mouton (2005) liken a research design to a blueprint that directs the researcher to solve problems pertaining to the case under investigation. It provides guidelines to the researcher with regard to the most appropriate data collection methods to follow.

5.4.1 Survey research

Survey research is regarded as one of the basic research methodologies in social research and to obtain information about the characteristics, perspectives, opinion or attitudes of people (Leedy & Ormrod, 2010). The word survey means “to look”, “to see over or beyond”, or “to observe” (Powell & Connaway, 2006, p. 83). Individuals are often used as units of analysis to ‘observe’ in a particular setting and the researcher thus gains an understanding of the phenomenon under investigation (Babbie & Mouton, 2006; Payne & Payne, 2004; Powell & Connaway, 2004). According to Powell and Connaway (2004), the basic premise of survey research is to make

inferences about large groups of people, often by means of a selection of a smaller group within the larger group. This selection process is often based on one or other sampling method.

Survey research design can be based on one or more of the three research purposes outlined in 5.2.1 above, viz. descriptive, explanatory, and exploratory. For the purpose of this study the researcher has opted to utilise a descriptive and exploratory approach.

According to Powell and Connaway (2004), a number of techniques can be used in survey research to gather the contemporary data required. The methods most often used include questionnaires and interviews. As mentioned in 5.2.2, interviews will be utilised in conjunction with questionnaires. The following is a brief outline of the two chosen methods:

5.4.1.1 Interviews

Through everyday discussions with people, one can develop an understanding of their world. In the interview situation, the researcher asks and listens as people give their viewpoints and experiences and gains insight into their experiences through scientific enquiry and explanation (Kvale & Brinkman, 2009). Research interviews thus go beyond everyday conversation, as they are subject to structure and purpose.

Interviewing as a mode of data or information collection is predominantly focused on providing a framework in which interviewees can express their own viewpoints and thoughts on a given subject or phenomenon. What is more, Kvale and Brinkman (2009, p. 17) caution that interviewing is a “craft” and its skills are learned through practice only. Interviewing, as a research tool, thus requires a specific level of expertise. In addition to this, Kahn and Cannell (1957, cited in Fontana & Frey, 2005) caution the researcher not only to have an understanding of interviewing as a technique, but emphasise the importance of the researcher having a real understanding of the environment of the respondent.

Interviews can vary from a very structured and often quantitative approach to an entirely unstructured and predominantly qualitative approach (Berry, 1999; Leonard, 2003). The former approach employs structured data-collection instruments where interviewees are asked the same questions in the same order and the answers are “amenable to statistical analysis” Leonard (2003, p. 166). Unstructured, or qualitative interviews are more flexible and open-ended and are often used to develop ideas rather than to collect facts and are more concerned with “trying to understand” how interviewees feel (p. 167). Moreover, unstructured interviews allow the interviewer to employ a “conversational style”. The interviewee establishes the mode

of the discussion. This method enables the interviewer to see the issue under discussion from the viewpoint of the interviewee. According to Leonard (2003), this method allows the interviewer to develop a bond with the interviewee.

The reliability of the interview technique, as is also the case with all qualitative research methods, depends to a large extent on the “consistency and trustworthiness of research findings” (Kvale & Brinkmann, 2009, p. 245). The question thus arises whether time intervals will have an effect on interviewee responses and whether they will give different answers to different interviewers. These factors, however, can to a large extent be counteracted by being aware of them (Kvale & Brinkmann, 2009, p.245) Kvale and Brinkmann thus recommend that interviewers should be allowed to follow their own style by following up on hunches (2009, p. 245).

It is for these reasons that this researcher adopted an open style by using a semi-structured interview schedule together with probing to obtain further in-depth information from the interviewees, e.g. policies that are being developed.

It is important when investigating the establishment of a content management system to gain insight into what has been done, what is presently known and what it is that the organisation wants from a content management system. Therefore, Boiko (2005) recommends an informal readiness assessment as a first phase of the project and which will encompass the visions and perceptions of the people who are directly involved with the implementation of the system. It was thus considered important to interview such stakeholders. Boiko (2005) as well as Rockley et al. (2003) suggest a list of possible stakeholders, which should include, amongst others, the content person (content analysts), content authors, visual designers, reviewers, publication staff and technology staff.

Interviews were thus used to gain insight into the opinions of individuals from each of the following four categories, namely, authors, publishers and editors, web managers and information technology staff. In addition, an interview was scheduled with a senior manager responsible for institutional solutions in terms of information technology. Unfortunately, it was only possible to secure three interviews¹¹ and these were conducted over a two day period. The respondents gave their consent for the interviews to be recorded digitally. Two respondents preferred to respond in Afrikaans and the third, in English.

¹¹The interview schedule was created in Afrikaans and English to allow interviewees to respond in their language of choice. The researcher speaks Afrikaans fluently.

The interview schedule consisted of the following main components:

Outline - Stakeholder interview schedule
Section 1 - Personal information
Section 2 - Interaction with the University's staff and student portals
Section 3 - Your vision of the University's content management system: <ul style="list-style-type: none"> ▪ as content authors ▪ as content reviewers ▪ as information technologist (software developer)
Section 4 - Your vision of the users' experiences with the portals

Table 5.1: Outline -Interview schedule

5.4.1.2 Questionnaires

The use of questionnaires has become the most frequently used data collection technique within the social sciences and particularly when conducting a survey. In principle, the researcher uses open-ended or unstructured questions and closed-ended or structured questions in questionnaires. In the case of open-ended questions, the respondent is afforded the opportunity to give their own account of their environment; for example, "What do you like most about the staff portal?" In contrast, closed-ended questions require the respondent to respond from a pre-defined scale or list, for example, "To what extent have you personalised your access to the staff portal?" The respondent thus needs to choose from a scale that could be typified in terms of interval levels: e.g., "to some extent", "to a great extent" and so forth (Delpont, 2002). Leedy and Ormrod (2010) have provided a list of suggestions that would make questionnaires effective and meaningful and thus obtain interpretable data:

- Questions should be concise and comprehensible.
- The researcher ought to guide the respondent on how to fill out the questionnaire.
- The researcher should be conscientious of any suppositions.
- The mode of questioning should be sound and the researcher should not lead the respondents to attain favourable responses.
- The questionnaire should be tested to ensure accurateness.

In addition to this, Babbie and Mouton (2005) and Mouton (2001) recommend that the questionnaire should address the following: possible ambiguous questions, answers ought to be mutuality exclusive phrased questions or double negative questions and double-barrelled

questions. Equally important, researchers should caution against spelling mistakes and bad or unappealing layout that will discourage the respondent from continuing.

Researchers can utilise various ways to administer the questionnaire and could include mailed, telephonic, personal, delivered or group-administered questionnaires (Delpont, 2002). In recent times, web-based questionnaires have gained popularity, but they require careful planning; for instance, their designs need to conform to a variety of layouts of internet browsers.

For the purpose of this study, the researcher decided to combine open-ended and close-ended questions.

According to Hackos (2001, p. 8) there are seven basic requirements that content should adhere to in order to address the needs of users and which are thus, fundamental to successful content management practices:

- “easy to find,
- accurate, up-to-date, and continuously refreshed,
- complete enough for users’ needs,
- well organized for quick search and retrieval,
- readable in the right language,
- linked to other relevant content, and
- targeted to each person’s needs and levels of experience and knowledge.”

The researcher is in accordance with these guidelines and thus based her questions on these requirements (cf. 3.2 – 3.4). Two questionnaires were thus designed to explore the preferences and perceptions of staff and students at the Stellenbosch University with regard to the University’s official website and the current staff and student portals. It was envisaged that this would assist the researcher to gain insight into what content should be included in a content management system. The questionnaires were created in Afrikaans and English and both groups were given the option to reply in the language of preference. The following is an outline of the main categories in the respective questionnaires (cf. Appendices G-J):

Outline - Staff Questionnaire	Outline - Student Questionnaire
Question 1 – Demographic information (close-ended questioning)	Question 1 – Demographic information (close-ended questioning)
Question 2 – Usage and perspective of the Stellenbosch University website (close-ended questioning)	Question 2 – Usage and perspective of the Stellenbosch University website (close-ended questioning)
Question 3 – Usage and perspective of the staff portal (close-ended questioning)	Question 3 – Usage and perspective of the student portal as well as mobile access (close-ended & open-ended questioning)
Question 4 – Perspective of the staff portal (open-ended questioning)	Question 4 – Perspective of the student portal (open-ended questioning)
Question 5 – Overall perspective of the staff and student portals and website (open-ended questioning)	Question 5 – Overall perspective of the student portals and website (open-ended questioning)

Table 5.2: Outline - staff and student questionnaires

The data analysis software *Nvivo 9* (open-ended questions) and *SPSS 19* (closed-ended- and open-ended questions) were utilised to analyse the data collected.

5.4.1.2.1 Sampling

Surveys that incorporate a large population, such as extensive government surveys, often necessitate that researchers select a smaller number of respondents, as full exposure to the total population is not always feasible because of time, cost and other confines. Several studies recommend sampling as an alternative means of studying phenomena (Babbie & Mouton, 2005; Leedy & Ormrod, 2010; Strydom & Venter, 2002). If scientific sampling methods are used, a researcher can infer characteristics pertaining to the whole population from the data collected from the sample.

Different sampling methods can be used to extract from a greater population. The two main categories, according to Leedy and Ormrod (2010) are probability sampling and non-probability sampling.

With probability sampling, each segment or stratum of the population is represented and by using a random selection process, each entity in the population stands an equal chance to be selected. The techniques that can be employed to extract the strata are simple random sampling, stratified random sampling, and proportional stratified random sampling (Leedy & Ormrod, 2010).

Non-probability sampling is often used where the researcher cannot predict that each person will have representation in a sample. Respondents are chosen in proportion to the general population, but not necessarily randomised.

The researcher has opted to stratify by means of proportional stratified random sampling in accordance with the proportions of each student or staff group representative of Stellenbosch University.

5.4.1.2.1.1 Sample frame and sample size

According to Babbie and Mouton (2005, p. 174) a sample frame outlines the elements from which a researcher selects the study population, also known as the “list of sampling units.” The researcher examines the frames and decides on the strata that should represent the broader population. Bailey (1994, p. 97) states that a good sample size for cases of several sub-populations which is large enough to produce significant results is 100 cases.

5.4.1.2.1.2 Units of analysis

Units of analysis in social research, relate to the entities being investigated. According to Babbie and Mouton (2005), data pertaining to the phenomenon being explored are collected with the aim of describing the units of analysis.

The purpose of this research project was to determine the viewpoints of users of the University’s websites and staff and student portals. The units of analysis for this study comprised the academic/research staff and administrative/services staff, as well as undergraduate, postgraduate and special students of the Stellenbosch University. Owing to the large population of students (both undergraduate and postgraduate) as well as staff (academic/research and administrative/services), the researcher decided to survey a sample group that was stratified into the various subsets of the population as outlined above.

5.4.1.2.2 Distribution of questionnaires

For the purpose of this study, the Stellenbosch University’s web-based e-Survey service was used. The two questionnaires (staff and student user groups) were created and distributed using the web-based software, *Checkbox®* v4.6 after an initial pilot test of five staff members and students were conducted.

Electronic mail invitations to participate in the web-based survey were sent to the selected respondents and the questionnaires were kept active for completion over four weeks. Owing to

a broken link in the mailed message, a number of staff and student respondents indicated that they could not access the respective questionnaires and follow-up invitations were sent shortly afterwards. This then also served as the reminder to participate in the survey.

From the 427 staff and 2593 students that were invited to participate in the survey the researcher received 116 staff and 209 student responses. The response rate for staff was 27%, and a low 8% was obtained for the student questionnaires. According to (Börkan, 2010; Shannon & Bradshaw, 2002), research concerned with internet survey methods has shown that they have a lower response rate than traditional mail surveys. In addition, the low response rate for student respondents could possibly be attributed to the fact that students generally have to pay for Internet access at the University. Although these response rates were low (a general problem with questionnaire studies), they still produced a sufficient number of responses to conduct reliable statistical analysis (cf. reference to Bailey's minimum of 100 in 5.4.1.2.1.1).

5.4.1.3 Validity and reliability

According to Leedy and Ormrod (2010) validity is the extent to which an "instrument measures what it is intended to measure." This argument is further developed by Kvale and Brinkman (2009, p. 246) who state that validity relates to whether a technique investigates what it "claims" to investigate and further, that it "refers to the truth, the correctness, and the strength of a statement."

Four tests have been widely adopted by social researchers that could address the quality of empirical research, namely, construct validity, internal validity, external validity and reliability. According to Yin (2009) internal validity is mostly employed in causal studies and has therefore not been applied to this study.

5.4.1.3.1 Construct validity

According to Yin (2009, p. 41) construct validity entails the ability to identify appropriate operational measures to be used for the study; it also proposes the use of multiple sources of evidence and for stakeholders to review draft reports. The researcher allowed the appropriate stakeholders at Stellenbosch University to review and comment on the proposed questionnaires to staff and students. In addition, a pilot interview was held with a major stakeholder to address any shortcomings in the proposed interview schedule.

5.4.1.3.2 External validity

External validity relates to the extent to which a study's findings can be generalised. It is therefore important to compare the evidence with external literature. The researcher took care to investigate the processes followed by several authors reporting on similar research projects and based on these studies she has created a synthesised approach. (cf. Chapters 2 & 3).

5.4.1.3.3 Reliability

According to Yin (2009), reliability is concerned with substantiating that a study can be repeated at a later stage, by the same or a different researcher, and still yields the same results. This could be achieved through proper documentation as the study progresses, thus enabling the researcher to give full account of observations made. For the purpose of this study, proper documentation was kept on the research methods used as well as the original recordings of interviews for possible follow-up.

5.4.1.4 Pilot study

It is often recommended that researchers incorporate a pilot study into the research design of social research to increase the credibility of the study. Bless and Higson-Smith (2000) as cited in Strydom (2002, p. 211) support this idea by defining pilot studies as, "A small study conducted prior to a larger piece of research to determine whether the methodology, sampling, instruments and analyses are adequate and appropriate." Singleton (1988), also cited in Strydom (2002), sees pilot studies as the practice of the researcher using a small number of individuals, who have the same characteristics of the target group, to test the various measurement instruments.

5.4.1.4.1 A study of the literature

In this study, a widespread review was conducted on important aspects of content management practices to better understand the intricacies of the subject domain. The literature reviewed encompassed various branches of the subject varying from content management strategies, readiness assessment and other auditing practices, information architecture, portal strategies and content management website design practices (Augustyniak et al., 2005a; Augustyniak et al., 2005b; Asprey & Middleton, 2005; Boiko, 2005; Nakano, 2002; & Rockley et al., 2003).

5.4.1.4.2 The experience of experts

According to Snyman (2002, p. 213) the "tapping" of the experiences of experts also offers many advantages. The researcher gained invaluable information from Mr. M. Smits (Tilburg University, The Netherlands) and Ms. S. Steele (Monash University, Australia) on university web

strategies, content audits, interview processes and strategy development as a whole. Ideas and insight gained from these information systems managers were incorporated in the research methods used in this survey study.

5.4.1.4.3 Preliminary exploratory studies

Similar to the information gained from experts from international institutions, valuable information was obtained from Ms. B. Kriel (Manager of Institutional Solutions, Stellenbosch University) in terms of the various platforms currently in use at the University, policies and strategic frameworks as well as the role of the Portal Committee.

5.4.1.4.4 Intensive study of strategic units

Snyman (2002) suggests that the researcher also undertakes a detailed study of the units of analysis and that the researcher selected a number of respondents to provide possible comments on the measurement instruments, as such measurements could lead to the modification thereof. Rubin (1983) as cited in Strydom (2002, p. 214) recommends that the researcher should “try the items out with actual subjects from the target population. Then rewrite and edit again all items that cause confusion...”

The researcher submitted copies of the questionnaire and interview questions to Ms. Kriel, as well as other members of the Portal Committee who studied the documents. Their ideas and comments were incorporated into the final version of the questionnaires and interview schedule. In addition to their comments, they also pointed out incorrect use of the official names of departments or faculties, as well as designations as they apply to the university community.

5.5 Conclusion

This chapter described the methodology utilised to conduct the empirical research of this study. A survey design using questionnaires and interviews as data collecting instruments were adopted in an effort to address the research problem. The data processing and analysis is reported in Chapter 6.

CHAPTER 6

DATA ANALYSIS

6.1 Introduction

The analysis of data was done based on the research goals of the study, i.e. to investigate how the Stellenbosch University can address the website and portal information needs of its users through the implementation of a content management system. The data analysis was done using *MS Excel*, *Statistical Package for the Social Sciences 19* (SPSS), and *NVivo 9* (specifically for the qualitative data).

While this chapter will focus on reporting the outcomes of the data analysis, Chapter 7 will concentrate on providing an outline of the researcher's interpretation and conclusions relating to the data analysis, recommendations regarding content management system implementation, and indications for further research.

As indicated in Chapter 3, to prepare an enterprise content management strategy, an organisation not only needs to gauge the needs of its users, but also identify its visions, goals and objectives for a content management system and understand the content life cycle of information within the organisation.

In the following two sections (6.2 & 6.3) the results of the data analysis will be discussed. The discussion of the staff questionnaire responses will be followed by that of the students. In each section the respondents' demographic profile will be outlined followed by the responses investigating the overall perceptions of staff and students with regard to the organisation's website and their respective portals. Cross-tabulations were used to analyse the effect of the independent or categorisation variables on the dependent variables and Chi-square tests were used to establish which cross-tabulations were significant. Only results that gave a Chi-square p-level $\leq .05$ and a Spearman Rank R correlation statistic with a p-level $\leq .05$ were used for reporting. In the final section (6.4) the analysis of the data obtained during the face to face interviews with important stakeholders are reported on.

6.2 Staff questionnaire

6.2.1 Demographic information

The staff respondent sample was compiled using a stratified random selection technique. The two strata consisted of the academic/research staff as well as the administrative/services staff. The sample drawn for each category was representative of the distribution in the total population. The questionnaire was administered to 427 staff members and 116 completed the questionnaire. This represents a response rate of 27%, which is fair considering the nature of the study and that the questionnaires were administered electronically. According to Börkan (2010), as well as Shannon and Bradshaw (2002), research concerned with internet survey methods has shown that they have a lower response rate than traditional mail surveys. Although the response rate was low (a general problem with questionnaire studies), it still produced a sufficient number of responses to conduct reliable statistical analysis (cf. reference to Bailey's minimum of 100 in 5.4.1.2.1.1).

Distribution by gender (Question 1.1)

It can be seen from Table 6.2.1.a that the majority of respondents consisted of females (73%). This can be attributed to the fact that the largest component of the sample consisted of administrative/services staff, the majority of which are female.

Q 1.1 Gender	
	Percent %
Female	73
Male	27
Total:	100
n = 116	

Table 6.2.1.a: Gender

Distribution by age (Question 1.2)

The age distribution ranged from the youngest group at 47% to 23% for the middle group and 30% for the older age group (cf. Table 6.2.1.b). It is interesting to note that the largest proportion of the respondents for the staff sample were in the youngest age category.

Q 1.2 Age	
	Percent %
40 or younger	47
41 - 50	23
51 or older	30
Total:	100
n = 116	

Table 6.2.1.b: Age categories

Distribution by employee category (Question 1.3)

Table 6.2.1.c depicts the distribution of the respondents according to whether they were academic/research, or administration/services staff. The academic/research staff represented 28% of the respondents, while 72% of the respondents belonged to the administrative/services staff category.

Q 1.3 Employee affiliation	
	Percent %
Administration/ Services	72
Academic/ Research	28
Total:	100
n = 116	

Table 6.2.1.c: Employee affiliation

Distribution by faculty (Question 1.4)

Table 6.2.1.d indicates how the respondents were distributed amongst the faculties. The distribution was fairly equal among Health Sciences (22%), Science Faculty (18%), Arts and Social Sciences and Economic and Management (14% each) and AgriSciences (10%). The other four faculties had responses of less than 10%. A number of the respondents from the Health Sciences Faculty commented on the fact that as a satellite campus they often experienced problems in accessing the portal and this feeling of dissatisfaction could have prompted more people to respond (cf. 6.2.5).

Q 1.4 Faculty involvement	
	Percent %
AgriScience	10
Arts and Social Sciences	14
Economic and Management Sciences	14
Education	2
Engineering	8
Health Sciences	22
Law	4
Military Sciences	2
Science	18
Theology	4
Total:	100
n = 116	

Table 6.2.1.d: Faculty involvement

Distribution by administration/services (Question 1.4)

The following table indicates how the administration and services respondents were distributed. Staff members from the Academic Support represent the highest response rate at 21%, followed by Academic Administration and Information Technology at 12% each. From the table it can be seen that fewer responses were received from staff members from Development & Alumni Relations, Institutional Research and Planning, Prospective Students Centre, Facilities Management, Human Resources, and the Library.

Q 1.4 Administration & Services involvement	
	Percent %
Academic Administration	12
Academic Support	21
Library	6
Facilities Management	9
Finance	7
Information Technology	12
Institutional Research and Planning	3
Human Resources	3
Development & Alumni Relations	10
Prospective Students Centre	3
Student Affairs	4
Total:	100
n = 116	

Table 6.2.1.e:Administration/Services involvement

6.2.2 Interaction with the Stellenbosch University's website

Extent of use of the Stellenbosch University website (Question 2.1)

The following table shows that most of the staff members visit the Stellenbosch University's website either on an 'average' frequency basis (48%) or on a 'very frequent' basis (41%).

Q 2.1 Use of website	
	Percent %
Infrequently	10
Average	48
Very frequently	42
Total:	100
n = 116	

Table 6.2.2.a: Use of website

Level of satisfaction with the Stellenbosch University website (Question 2.2)

The results as represented in Table 6.2.2.b indicate that 76% of the staff members are satisfied with the University's website, while 19% of the staff members indicate an average level of satisfaction with the website and only 5% are dissatisfied.

Q 2.2 Level of Satisfaction - website	
	Percent %
Dissatisfied	5
Average	19
Satisfied	76
Total:	100
n = 116	

Table 6.2.2.b: Level of satisfaction with website

6.2.3 Interaction with the Stellenbosch University staff portal

Extent of use of the Stellenbosch University staff portal (Question 3.1)

A similar response to that provided for the use of the website was given for the use of the staff portal (cf. Table 6.2.3.a). One possible explanation for the similar results could be the fact that the staff portal's sign-in resides on the University's website, and in their mind the two sites were the same.

Q 3.1 Use of staff portal	
	Percent %
Infrequently	10
Average	48
Very frequently	42
Total :	100
n = 116	

Table 6.2.3.a: Use of staff portal

Importance of having access to various specific links on the staff portal (Question 3.2)

From Table 6.2.3.b it can be seen that the categories that were rated by the majority of the staff sample as being 'very important' were the: *Teaching and Learning* (56%), *Research* (50%) and *For Management* (54%) links.

Q 3.2 Importance of accessing specific links				
	Percent %			
	<i>Teaching and Learning</i>	<i>Research</i>	<i>Community Interaction</i>	<i>For Management</i>
Of little importance	21	28	33	23
Average	23	22	30	22
Very important	56	50	37	54
Total :	100	100	100	100
n = 116				

Table 6.2.3.b: Use of specific links on the staff portal

Level of importance to have access to sub-links from the Teaching and Learning link on the staff portal (Question 3.2.1)

From Table 6.2.3.c it can be seen that the categories that were rated by the largest proportion of staff as being 'very important' were: *University Calendar* (56%), *Manage Students* (47%), *Exam/Test Information* (45%) and *Timetables* (41%).

Q 3.2.1 Access from Teaching and Learning to various sub-links													
	Percent %												
	<i>Manage Modules</i>	<i>Manage Curriculum</i>	<i>Manage Students</i>	<i>Webstudies</i>	<i>First-year Academy Monitoring System</i>	<i>Exam/Test Information</i>	<i>Timetables</i>	<i>Academic Support</i>	<i>Centre for Teaching and Learning</i>	<i>University Calendar</i>	<i>Information Cafeteria</i>	<i>Access Tests</i>	<i>Summer School</i>
Of little importance	44	47	32	41	45	39	34	37	38	19	31	49	53
Average	23	27	21	17	30	16	23	42	22	24	28	26	30
Very important	32	25	47	41	23	45	41	19	37	56	39	23	14
Total:	100	100	100	100	100	100	100	100	100	100	100	100	100
n=116													

Table 6.2.3.c: Use of Teaching and Learning sub-links

Importance of having access to sub-links from the Research link on the staff portal (Question 3.2.3)

From Table 6.2.3.d it can be seen that the categories that were rated by the largest proportion of staff as being ‘very important’ were *Library Support* (55%), *Research Support Tools* and *Research@Stellenbosch* (46% each) and *Information Cafeteria* (44%).

Q 3.2.2 Access from Research to sub-links							
	Percent %						
	<i>Research Support Tools</i>	<i>INDAGO</i>	<i>Research@Stellenbosch</i>	<i>Library Support</i>	<i>Information Cafeteria</i>	<i>InnovUS</i>	<i>Contract Research</i>
Of little importance	38	52	32	29	33	41	46
Average	16	26	22	16	23	28	22
Very important	46	22	46	55	44	31	33
Total:	100	100	100	100	100	100	100
n=116							

Table 6.2.3.d: Use of Research sub-links

Importance of having access to sub-links from the Community Interaction link on the staff portal (Question 3.2.3)

With reference to access to the *Community Interaction* sub-link the staff members’ views were more or less equally distributed among the three levels of importance for *Community Interaction* and *Project Database*.

Q 3.2.3 Access from Community Interaction to sub-links		
	Percent %	
	<i>Community Interaction</i>	<i>Project Database</i>
Of little importance	32	36
Average	36	29
Very important	32	34
Total:	100	100
n=116		

Table 6.2.3.e: Use of Community Interaction sub-links

Importance of having access to sub-links from the For Management link on the staff portal (Question 3.2.4)

From table 6.2.3.d it can be seen that the categories that were rated by the largest proportion of staff as being ‘very important’ to have access to: *My Management Information* (54%), *Meeting Documentation* (45%), *Information Cafeteria* and *Media Articles* (41%).

Q 3.2.4 Access from For Management to sub-links					
	Percent %				
	<i>Media Articles</i>	<i>My Management Information</i>	<i>First-year Academy Monitoring System</i>	<i>Meeting Documentation</i>	<i>Information Cafeteria</i>
Of little importance	24	22	38	31	29
Average	35	23	24	24	30
Very important	41	54	38	45	41
Total:	100	100	100	100	100
					n=116

Table 6.2.3.f: Use of For Management sub-links

Extent to which staff members use functions available on the staff portal (Question 3.3)

From Table 6.2.3.g it can be seen that the categories that were rated by the majority of staff as being ‘very important’ were: *My Sun-e-HR* (86%), *Manage Password* (66%), *My Webmail* (66%), *Payslip* (63%), *Policies, Procedures & Forms* (62%), *Boschtelegram* (57%), and *Staff Development* (50%).

Q 3.4 Extent of use of functions														
	Percent %													
	<i>Payslip</i>	<i>Telephone Account</i>	<i>Internet Account</i>	<i>Manage Password</i>	<i>Boschtelegram</i>	<i>Share/manage My Documents</i>	<i>My Library</i>	<i>My Sun-e-HR</i>	<i>My Webmail</i>	<i>My Storage Space</i>	<i>Policies, Procedures & Forms</i>	<i>Staff Development</i>	<i>Staff Association</i>	<i>Find</i>
Of little importance	9	32	22	7	9	32	30	1	12	30	11	16	39	26
Average	28	34	40	28	34	34	28	13	22	31	27	34	34	28
Very important	63	34	39	66	57	34	42	86	66	39	62	50	28	46
Total:	100	100	100	100	100	100	100	100	100	100	100	100	100	100
n=116														

Table 6.2.3.g: Use of functions

Extent to which staff members have customised the staff portal (Question 3.4)

The results in Table 6.2.3.h show that the 'little importance' evaluation was given higher ratings than the 'average' and 'very important' categories at 59% for the *Social Media*, 47% for *Favourites*, 45% for *Quick Links* and 41% for *My Profile* links. The majority, however, thought this feature to be of 'average' importance or 'very important' (see also response in 6.2.5 under 'Personalisation and customisation').

Q 3.4 Extent of customisation of resources				
	Percent %			
	<i>Favourites</i>	<i>Quick Links</i>	<i>My Profile</i>	<i>Social Media (e.g. Facebook)</i>
Of little importance	47	45	41	59
Average	31	33	36	26
Very important	22	22	23	16
Total:	100	100	100	100
n=116				

Table 6.2.3.h: Value rating for 'Extent of customisation'

Extent to which staff members agree or disagree with various statements regarding the staff portal (Question 3.5.1-3.5.4)

Staff members were also asked to agree or disagree with various statements regarding the staff portal. The results of Table 6.2.3.i show that:

- the majority of staff members agree that it is easy to find information on the portal (72%),
- that the organisation (layout) of information is clear (67%),
- that it is easy to search for information (58%), and
- that the information available on the staff portal is up-to-date (72%).

Extent to which staff members agree or disagree with various statements				
Q 3.5.1 Easy to find		Q 3.5.2 Organisational layout clear	Q 3.5.3 Easy to search	Q 3.5.4 Up to date
	Percent %	Percent %	Percent %	Percent %
Disagree	16	19	21	11
Average	11	14	22	16
Agree	72	67	58	72
Total:	100	100	100	100
				n= 116

Table 6.2.3.i: Extent to which staff members agree or disagree with overall usability of the staff portal

6.2.4 Cross-tabulation between the independent categorisation variables and the dependent variables that depict staff portal factors

In this section the data that produced significant Chi-square results ($p \leq .05$) and Spearman Rank coefficients ($p \leq .05$) are discussed, e.g. that for gender, employee affiliation, administration and services division or faculty.

6.2.4.1 Significant results for gender

Access from Research to Library Support (Question 3.2.2)

The significant results of the cross-tabulation between gender and access to *Library Support* are depicted in Table 6.2.4.1.a. While 55% of the total sample rated access to *Library Support* as ‘very important’ it can be seen that more of the female staff (62%) valued this attribute highly than their male counterparts (35%).

Q 3.2.2 Access from Research to: <i>Library Support</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	62%	13%	25%	100%
Male	35%	23%	42%	100%
Total:	55%	16%	29%	100%
				n=116
				Chi-square: $p=.03627$; Spearman Rank R: $p=.01362$

Table 6.2.4.1.a: Link from Research to Library Support (Significant results for gender)

Use of specific functions - Boschtelegram (Question 3.3)

The significant results of the cross-tabulation between gender and use of the *Boschtelegram* functions are depicted in Table 6.2.4.1.b. While 57% of the total sample rated access to *Boschtelegram* as 'very important' it can be seen that more of the female staff (62%) valued this attribute highly than their male counterparts (42%).

Q 3.3 Use Functions: <i>Boschtelegram</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	62%	33%	5%	100%
Male	42%	39%	19%	100%
Total:	57%	34%	9%	100%
				n=116
				Chi-square: $p=.02307$; Spearman Rank R: $p=.01899$

Table 6.2.4.1.b: Use of functions Boschtelegram (Significant results for gender)

From the above it can be seen that generally speaking the female staff held a more positive view on a number of aspects with regard to the staff portal.

6.2.4.2 Significant results for employee affiliation

Access to Teaching and Learning (Question 3.2)

The significant results of the cross-tabulation between employee affiliation and access to *Teaching and Learning* are depicted in Table 6.2.4.2.a below. While 56% of the total sample rated access to *Teaching and Learning* as 'very important' it can be seen that far more of the academic/research staff (76%) valued this attribute highly than the administrative/services staff (48%).

Q 3.2 Access to Teaching and Learning				
Importance X Employee affiliation	Percent %			
	Very important	Average	Of little importance	Total
Administrative/ Services	48%	25%	27%	100%
Academic/ Research	76%	18%	6%	100%
Total:	56%	23%	21%	100%
				n=116
				Chi-square: $p=.001436$; Spearman Rank R: $p=.00349$

Table 6.2.4.2.a: *Teaching and Learning* (Significant results for employee affiliation)

Access to Research (Question 3.2)

With regard to the *Research* link the significant cross tabulation data results are depicted in Table 6.2.4.2.below. It can be seen that while 50% of the total sample rated access to the *Research* link as 'very important' far more of the academic/research staff (70%) valued this attribute highly than the administrative/services staff (42%).

Q 3.2 Access to Research				
Importance X Employee affiliation	Percent %			
	Very important	Average	Of little importance	Total
Administrative/ Services	42%	24%	34%	100%
Academic/ Research	70%	15%	15%	100%
Total:	50%	22%	28%	100%
				n=116
				Chi-square: $p=.002571$; Spearman Rank R: $p=.00755$

Table 6.2.4.2.b: *Research* (Significant results for employee affiliation)

Access from Teaching and Learning (T&L) to Timetables (Question 3.2.1)

The significant results of the cross-tabulation between the *Timetables* sub-link and employee affiliation (cf. Table 6.2.4.2.c below) indicated that while only 42% of the total sample rated having access from T&L to *Timetables* as ‘very important’ far more of the academic/research staff (58%) valued this attribute highly than the administrative/services staff (35%).

Q3.2.1 Access from T&L to Timetables				
Importance X Employee Affiliation	Percent %			
	Very important	Average	Of little importance	Total
Administrative/ Services	35%	22%	43%	100%
Academic/ Research	58%	27%	15%	100%
Total:	42%	23%	35%	100%
				n=116
Chi-square: p=.01664 ; Spearman Rank R: p=.00574				

Table 6.2.4.2.c: Link from Teaching and Learning to Timetables (Significant results for employee affiliation)

Access from Research to Research Support Tools (Question 3.2.2)

The significant results from the cross-tabulation for *Research Support Tools* and employee affiliation indicated that while only 46% of the total sample rated access to *Research Support Tools* as ‘very important’ far more of the academic/research staff (64%) valued this attribute highly than the administrative/services staff (39%).

Q3.2.2 Access from Research to: Research Support Tools				
Importance X Employee Affiliation	Percent %			
	Very important	Average	Of little importance	Total
Administrative/ Services	39%	17%	45%	100%
Academic/ Research	64%	15%	21%	100%
Total:	46%	16%	38%	100%
				n=116
Chi-square: p=.03522 ; Spearman Rank R: p=.00942				

Table 6.2.4.2.d: Link from Research to Research Support Tools (Significant results for employee affiliation)

Use of specific functions - My Library (Question 3.3)

The significant results from the cross-tabulation of the *My Library* function with the employee affiliation category data (cf. Table 6.2.4.2.e below) indicated that while only 42% of the total sample rated access to *My Library* as ‘very important’ far more of the academic/research staff (67%) valued this attribute highly than the administrative/services staff (33%).

Q 3.3 Use of Specific Functions: <i>My Library</i>				
Importance X Employee Affiliation	Percent %			
	Very important	Average	Of little importance	Total
Administrative/Services	33%	33%	35%	100%
Academic/Research	67%	15%	18%	100%
Total:	42%	28%	30%	100%
				n=116
				Chi-square: p=.00352 ; Spearman Rank R: p=.00235

Table 6.2.4.2.e: Use of Specific Functions - My Library (Significant results for employee affiliation)

From the above it can be seen that the academic/research staff considered access to all the categories with significant results more important than the administrative/services staff did.

6.2.4.3 Significant results for administration/services division or faculty

Access to Teaching and Learning (Question 3.2)

From the significant results of the cross-tabulation between *Teaching and Learning* and administration/services division or faculty (cf. Table 6.2.4.3.a below) it can be seen that while 56% of the total sample rated access to *Teaching and Learning* as ‘very important’ far more of the faculty staff (71%) valued this attribute highly than the administrative/services staff (45%).

Q 3.2 Access to Teaching and Learning				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration /Services	45%	27%	28%	100%
Faculty	71%	18%	10%	100%
Total:	56%	23%	21%	100%
				n=116
Chi-square: p=.01125 ; Spearman Rank R: p=.00251				

Table 6.2.4.3.a: Teaching and Learning (Significant results for administration/services division or faculty)

Access from Teaching and Learning to Manage Modules (Question 3.2.1)

From the significant results of the cross-tabulation between *Manage Modules* and administration/services division or faculty (cf. Table 6.2.4.3.b below) it can be seen that while only 32% of the total sample rated access to *Manage Modules* as ‘very important’ considerably more faculty staff (43%) valued this attribute highly than the administrative/services staff (24%).

Q 3.2.1 Access from T&L to: Manage Modules				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration /Services	24%	21%	55%	100%
Faculty	43%	27%	31%	100%
Total:	32%	23%	44%	100%
				n=116
Chi-square: p=.03020 ; Spearman Rank R: p=.00840				

Table 6.2.4.3.b: Link from Teaching and Learning to Manage Modules (Significant results for administration / services division or faculty)

Access from Teaching and Learning (T&L) to Manage Students (Question 3.2.1)

With regard to access to the *Manage Students* sub-link, the significant cross-tabulation data indicated (cf. Table 6.2.4.3.c below) that while 47% of the total sample rated access to *Manage Students* as ‘very important’ considerably more faculty staff (61%) valued this attribute highly than the administrative/services staff (36%).

Q 3.2.1 Access from T&L to: Manage Students				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration /Services	36%	18%	45%	100%
Faculty	61%	24%	14%	100%
Total:	47%	21%	32%	100%
				n=116
				Chi-square: p=.00172 ; Spearman Rank R: p=.00076

Table 6.2.4.3.c: Link from Teaching and Learning to Manage Students (Significant results for administration / services division or faculty)

Access from Teaching and Learning (T&L) to Webstudies (Question 3.2.1)

The significant results of the cross-tabulation between *Webstudies* and administration/services division and faculty (cf. Table 6.2.4.3.d) indicated that while only 41% of the total sample rated access to *Webstudies* as ‘very important’ more faculty staff (49%) valued this attribute highly than the administrative/services staff (35%).

Q 3.2.1 Access from T&L to Webstudies				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration and Services	35%	14%	52%	100%
Faculty	49%	22%	29%	100%
Total:	41%	17%	42%	100%
				n=116
				Chi-square: p=.04558 ; Spearman Rank R: p=.03033

Table 6.2.4.3.d: Link from Teaching and Learning to Webstudies (Significant results for administration /services division or faculty)

Access from Teaching and Learning to Exam/Test Information (Question 3.2.1)

The significant results of the cross-tabulation between *Exam/Test Information* and administration & services division and faculty (cf. Table 6.2.4.3.e below) that while 45% of the total sample rated Access from T&L to *Exam/Test Information* as ‘very important’ far more of the faculty staff (63%) valued this attribute highly than their administration/services colleagues (32%).

Q 3.2.1 Access from T&L to Exam/Test Information				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration and Services	32%	14%	55%	100%
Faculty	63%	18%	18%	100%
Total:	45%	16%	39%	100%
				n=116
Chi-square: p=.00034 ; Spearman Rank R: p=.00007				

Table 6.2.4.3.e: Link from Teaching and Learning to Exam/Test Information (Significant results for administration / services division and faculty)

Access from Teaching and Learning to Timetables (Question 3.2.1)

From the significant results of the cross-tabulation between *Timetables* and administration/services division and faculty (cf. Table 6.2.4.3.f below) it can be seen that while 42% of the total sample rated Access from T&L to *Timetables* as ‘very important’ far more of the faculty staff (57%) valued this attribute highly than their administration/services colleagues (30%).

Q 3.2.1 Access from T&L to Timetables				
Importance X Division or Faculty	Percent %			
	Very important	Average	Of little importance	Total
Administration and Services	30%	20%	50%	100%
Faculty	57%	29%	14%	100%
Total:	42%	23%	35%	100%
				n=116
Chi-square: p=.00032 ; Spearman Rank R: p=.00012				

Table 6.2.4.3.f: Link from Teaching and Learning to Timetables (Significant results for administration/services division or faculty)

From the significant results outlined in the previous section it can be seen that the faculty staff considered it more important than the administrative/services staff to have access to the *Teaching and Learning* categories that are available from the staff portal.

6.2.5 What elements of the staff portal staff like most, like least (Question 4.1 & Question 4.2)

The following section outlines the feedback from those respondents who commented on the elements they like most or least of the staff portal. These responses were categorised according to the following themes: design and layout (including visual design and labelling); information (including relevancy and currency of information); navigation; user-friendliness; training; search/find features; personalisation and customisation; and technical concerns (Rosenfeld & Morville, 1998).

Design and layout

Of the respondents who offered comments on design and layout, more than half mentioned some difficulties with regard to the design and layout of the portal. The following extracts highlight respondents' comments.

Likes:

"That I have information links on the left side of the page – it is fast to click."

"It is professional, 'good-looking' and colourful."

"The fact that news headlines are displayed on the front page."

Dislikes:

"Layout is old-fashioned."

"I just find the format of the different pieces of information so disjunctive. Different fonts, different styles... feels like it's all cobbled together."

"It's too busy regarding the amount of text."

Information

More than half of the respondents who opted to comment felt that it was easy to find information. Respondents also liked the fact that they could access personal information via the portal through a single point of entry. Only a few staff members believed that the information was congested and felt that the portal had too much information. The following extracts highlight respondents' varied perceptions with regard to the information available on the staff portal:

Likes:

"It is relatively easy to find information on other departments/faculties."

“It is convenient to get personal information in one place.”

“You can find much of what you need without having to call anyone or go anywhere. The information is good and it's there and it is mostly up to date.”

Dislikes:

“Too much information; routes are not easy to find.”

“Some staff members' contact numbers are not on the webpage. Also, their office numbers. This is important to students.”

“It appears too congested with information.” “I'd also like more info from HR regarding policies and procedures. Some of that info is hard to find.”

“I think there should be interactive information available, and any relevant, new policies, etc should not only be easily accessible, but should be published in an area of the staff portal on an ongoing basis.”

Navigation

Similar to the design and layout aspects of the staff portal, more than half of the respondents who offered comments referred to some difficulties they experienced with regard to navigating to information available on the portal. The following pertinent comments reflect the differing views of the respondents:

Likes:

“Sun e-HR – it is easy to arrange for leave, to enrol for workshops, etc. E-library – what a dream. All relevant information available. I come from another university where it was a mission to obtain all this information electronically.”

“Easy accessibility and layout...”

Dislikes:

“Some info has too many subdivisions and this makes searching a tedious exercise if you don't have time.”

“Important information is often buried several levels into the portal.”

User-friendliness

With regards to user-friendliness, more than half of the respondents positively commented on this attribute. A small number of respondents commented on the user-unfriendliness of the portal.

Likes:

“The fact that I can put in leave via the staff portal. It makes it so much easier than having to fill in forms by hand.”

“User friendly, easy to access and secure.”

Dislikes:

“Sometimes user-unfriendly. Sometimes there is no specific access to links that are provided [broken links].”

“No training or orientation in the usage of this. You just hear about it accidentally.”

“Important information is often buried several levels into the portal.”

Search/Find features

In terms of searching¹², more than half of the respondents who opted to comment considered it difficult to search for information. The following comments highlight this viewpoint:

Dislikes:

“I sometimes have to search for information, and it isn't always under keywords I would expect.”

“I never find the search function on the University's web pages (that is the relevant search results) to be helpful.”

Personalisation and customisation

More than half of the respondents who commented on this category felt positive about the ability to customise the portal to accommodate personal preferences. This is in apparent contrast to the responses received. The following comments from respondents illustrate this viewpoint:

Likes:

“Those things that I have control over such as student interaction. “The electronic submissions of leave requests.”

“Sun e-HR;, it is easy to arrange leave, to enrol for workshops, etc. using SUN e-HR. E-library – what a dream to have all this personal information available.”

¹² The search function is labelled as “Find” on the staff portal.

Dislikes:

“The interface is not very pretty - it's more functional rather than inviting or personal.”

“The information is not sorted the way I would prefer it to be.”

“Perhaps make the customisation features more attractive to encourage their use. Make it a more personalised space and more user-friendly in terms of look and feel.”

Technical issues

In contrast to the feedback on the information category, more respondents pointed out a number of technical difficulties, more specifically in terms of integration with other campus systems such as HR-related features. In addition, a number of responses related to issues relating to general technical facets. The following comments from respondents illustrate their opinions on technical issues:

Likes:

“It is a central structure allowing one to find all other information networks easily.”

“The attempts made so far to try and improve access of available data.”

Dislikes:

“The constant errors. They make the portal seem unprofessional and unreliable.”

“Within SUN e-HR you cannot fix input mistakes yourself.”

“The system loads very slowly, especially ad hoc payments.”

“Irrelevant to satellite campuses. Slow and cumbersome. Dependent on too many other subsystems to work. Important information is often buried several levels into the portal. Subsystems do not interact with each other properly.”

6.2.6 Changes or comments with regard to the University's website or staff portals (Question 4.3 & Question 5)

Comments with reference to Question 4.3 and Question 5 were grouped together as the themes were similar. The main aspects which the staff would like to see changed, and which showed some commonalities with the responses to questions 4.1 and 4.2, include the following:

- faster connectivity required , especially with regard to the satellite campuses,
- access to Webmail and Webstudies sometimes very slow,
- e-HR leave pages are confusing when choosing the type of leave,
- customisation features should be enhanced to encourage use,
- a personalised space with a user-friendly look and feel should be created,
- 'Find/Search' feature should be enhanced,
- navigation should be enhanced for easier navigation to information required,

- only include information that is necessary and not cluttered with media, adverts, etc., and which is linked to the University's core functions,
- single-point sign-in required to 'push' relevant information to individual user,
- create a section with frequently asked questions (FAQs) to address problem areas,
- increase the line and column spacing between text boxes and tables to increase readability,
- terminology used for navigation buttons, links and menus are ambiguous and should be revised,
- timely updates of yearbooks required,
- eliminate inconsistency in the presentation of information,
- University website is unattractive,
- website lacks the visual essence of a good website, and
- content is useful and functional, but unattractive to visitors.

6.3 Student questionnaire

6.3.1 Demographic information

The student respondent sample was compiled using a stratified random selection technique. The two strata consisted, on the one hand, of the undergraduate students and, on the other, of the postgraduate students. The sample drawn for each category was representative of the distribution in the total population. The questionnaire was administered to 2593 students and 209 completed the questionnaire. One possible explanation for the low response rate (8%) could be the fact that students have to pay for Internet access at the University, the other is similar to that mentioned in 6.2.1, i.e. that internet surveys generally have a lower response rate than traditional mail surveys (Börkan, 2010; Shannon & Bradshaw, 2002). The number of responses was according to Bailey still sufficient for accurate statistical analysis (cf. 5.4.1.2.1.1).

Distribution by gender (Question 1.1)

It can be seen from Table 6.3.1.a that the majority of respondents consisted of females (55%).

1.1 Gender	
	Percent %
Female	55
Male	45
Total:	100
n = 209	

Table 6.3.1.a: Gender

Distribution by age (Question 1.2)

The age distribution ranged from the youngest group at 52% to 39% for the middle group and 9% for the older age group. This response is not surprising considering that the majority of students were at the undergraduate and not postgraduate level (see Table 6.3.1.c below).

1.2 Age	
	Percent %
20 or younger	52
21 - 25	39
26 or older	9
Total:	100
n = 209	

Table 6.3.1.b: Age categories

Distribution by level of study (Question 1.3)

Table 6.3.1.c depicts the distribution of the respondents according to whether they were undergraduate or postgraduate students. The undergraduate students represented the majority of the respondents (82%), while 18% of the respondents belonged to the postgraduate category.

1.3 Study level	
	Percent %
Undergraduate students	82
Postgraduate students	18
Total:	100
n = 209	

Table 6.3.1.c: Level of study

Distribution by faculty of study (Question 1.4)

Table 6.3.1.d indicates how the students were distributed amongst the faculties. Health Sciences and Arts and Social Sciences reflected the highest number of respondents with 22% each, followed by Law at 17% and Economic and Management Sciences at 14%. The other six faculties had responses of less than 10%.

1.4 Faculty of study	
	Percent %
AgriScience	2
Arts and Social Sciences	22
Economic and Management Sciences	14
Education	3
Engineering	8
Health Sciences	22
Law	17
Military Sciences	6
Science	4
Theology	1
Total:	100
n = 209	

Table 6.3.1.d: Faculty of study

6.3.2 Interaction with the Stellenbosch University's website

Extent of use of the Stellenbosch University website (Question 2.1)

The following table shows the anomalous situation where most of the students visit the University's website either infrequently (35%) or very frequently (38%).

2.1 Use of website	
	Percent %
Infrequently	35
Average	27
Very frequently	38
Total:	100
n = 209	

Table 6.3.2.a: Use of website

Level of satisfaction with the Stellenbosch University website (Question 2.2)

The results as represented in Table 6.3.2.b indicate that the majority (58%) of the students are satisfied with the University's website, 22% of students have an average level of satisfaction and 19% are dissatisfied.

2.2 Level of satisfaction - website	
	Percent %
Dissatisfied	19
Average	22
Satisfied	58
Total:	100
n = 209	

Table 6.3.2.b: Level of satisfaction with website

6.3.3 Interaction with the Stellenbosch University student portal

Extent of use of the Stellenbosch University student portal (Question 3.1)

The results as represented in Table 6.3.3.a indicate that the majority of students use the student portal very frequently (65%), 29% of students indicated an average use of the portal, while only 7% indicate that they infrequently use the student portal.

3.1 Use of student portal	
	Percent %
Infrequently	7
Average	29
Very frequently	65
Total:	100
n = 209	

Table 6.3.3.a: Use of student portal

Importance of having access to specific links on the student portal (Question 3.2)

From Table 6.3.3.b it can be seen that the categories that were rated by the majority of students as being 'very important' were: *Module Time Distributions* (80%), *Term Dates* and *Venue Time Distribution* at 78% each, *My Test/Exam Information* (78%) and *My Academic History* (76%), *Class Group Allocation* (68%), *Programmes* (64%), *Manage Print Credits* (65%), *My Library* (62%) and *My Faculty* (55%).

The categories that a high proportion of students rated as of 'little importance' are the following: *Submission of Theses/Dissertations* (44%), *Progress Report M and D Students* (41%), and *Register for Winter/Summer School* (38%).

The students' views were more or less equally distributed among the three levels of importance for the following: *Register for Winter/Summer School, Learnwell Study Aid, Policies and Regulations, My RGA and Study Abroad.*

3.2 Access on MyMaties.com to various specific links about studies																			
	Percent %																		
	First Year's Early Support	Term Dates	Progress Report M and D Students	Submission of Theses/ Dissertations	Register for Winter/ Summer School	Learnwell Study Aid	Policies and Regulations	My Library	Venue Time distributions	Module Time distributions	Class Group Allocation	Academic Affairs Council	My Faculty	My RGA	Manage Print Credits	Graduation	My Academic History	Programmes	Study Abroad
Of little importance	29	7	41	44	38	35	26	11	10	11	18	24	16	29	10	32	8	13	30
Average	24	16	20	20	34	33	35	27	12	9	14	45	29	35	25	23	16	23	35
Very important	47	78	39	36	28	32	39	62	78	80	68	30	55	36	65	45	76	64	35
Total:	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

n=209

Table 6.3.3.b: Access to specific links on student portal

Level of importance to have use of functions on the student portal (Question 3.3)

From Table 6.3.3.c it can be seen that the categories that were rated by the majority of students as being 'very important' were: *Webmail* (84%) and *My Test/Exam Information* (78%). Other categories that a significant number of students find "very important" include: *My Registration* (49%), *My Official Documents* (47%), *My Computer Service* (43%) and *My Finances* (42%).

The categories that were rated by the majority of students as 'of little importance' are the following: *Societies* (56%), *Student Council* (55%) and *Find* (55%). Other categories that a large proportion of students find of 'little importance' include: *My Storage Space, My Social Networks* and *My Future* that rated identical (49%), *My Graduation* (48%) and *My Campus Accommodation* (43%).

The students' views were more or less equally distributed among the three levels of importance for *My Profile* and *My Campus*.

3.3 Use of functions																
	Percent %															
	My Profile	My Registration	Webmail	My Graduation	My Test/Exam Information	My Official Documents	My Storage Space	My Social Networks	My Computer Services	My Campus Accommodation	My Finances	My Campus	My Future	Student Council	Societies	Find
Of little importance	25	14	7	48	11	18	49	49	26	43	26	35	49	55	56	55
Average	38	36	9	29	12	35	31	23	31	25	33	34	33	31	33	30
Very important	37	49	84	23	78	47	20	27	43	32	42	31	18	14	11	16
Total:	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
n=209																

Table 6.3.3.c: Use of specific functions

Extent of customisation of resources available from the student portal (Question 3.4)

The results in Table 6.3.3.d show that the majority of students think it is of 'little importance' to customise their portals to have access to *My Kampusskakels* (64%) and *Share in our social networks* (e.g. Facebook, MXit) (63%).

3.4 Extent of customisation of resources		
	Percent %	
	'My Kampusskakels'	Share in our social networks (e.g. Facebook, MXit)
Of little importance	64	63
Average	22	19
Very important	13	18
Total:	100	100
n=209		

Table 6.3.3.d: Extent of customisation of resources

Extent of use of the mobile service MyMaties Mobile (Question 3.5)

The data in Table 6.3.3.e show that the majority of students do not make use of the *MyMaties Mobile* service (68%).

3.5 Use of MyMaties Mobile	
	Percent %
Yes	32
No	68
Total:	100
n=209	

Table 6.3.3.e: Use of mobile service

Level of importance to have access to certain information via MyMaties Mobile (Question 3.6)

The results of Table 6.3.3.f indicate that the majority of students, irrespective of their response in Table 6.3.3.e, find it 'very important' to have access to the following information via their mobile phones: *Exam Results* (83%), *Exam Time Distribution* (79%) and *Exam Venues* (79%).

Conversely, the majority of students indicated that it is of 'little importance' to them to have access to *Follow us on Twitter* (69%).

3.6. Access via MyMaties Mobile to certain information				
	Percent %			
	Exam Results	Exam Time distribution	Exam Venues	Follow us on Twitter
Of little importance	9	11	11	69
Average	8	11	11	18
Very important	83	79	79	12
Total:	100	100	100	100
n= 209				

Table 6.3.3.f: Access to information via MyMaties Mobile

Which information should feature on the mobile student portal? (Question 3.7)

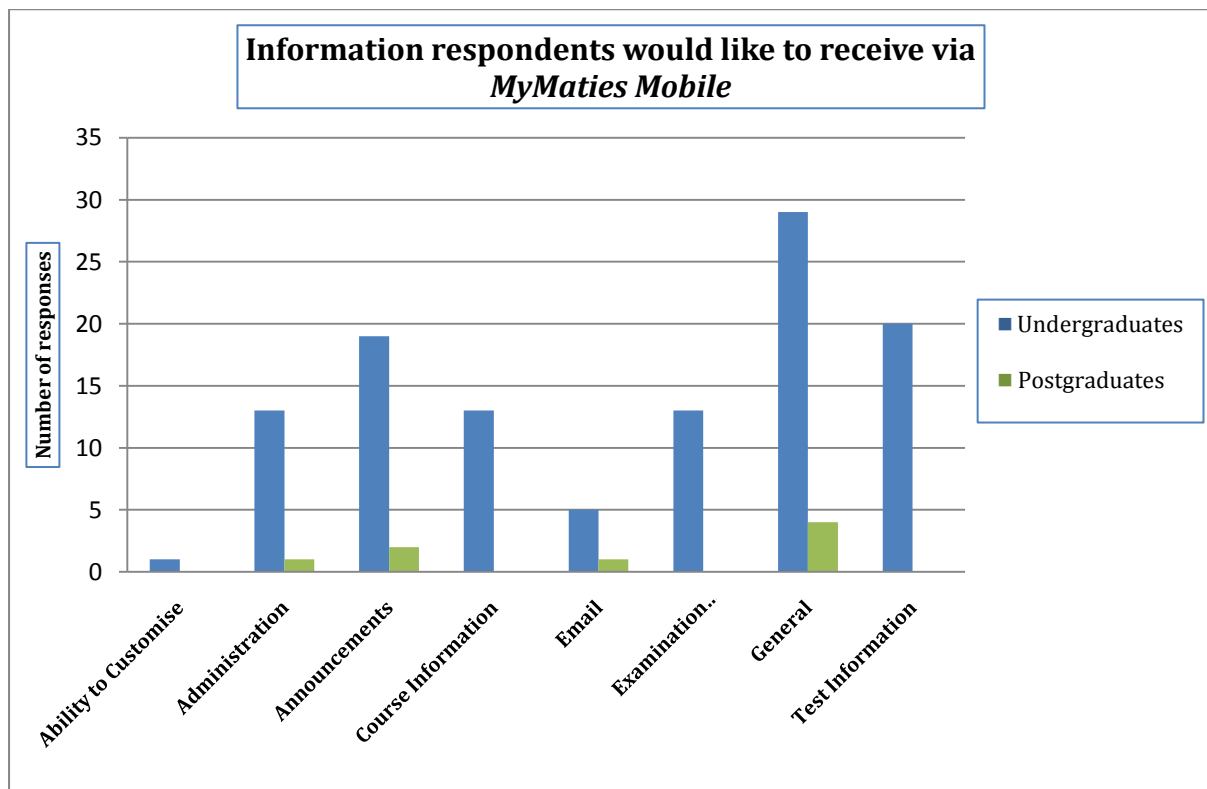


Chart 6.3.3: Information that should feature on MyMaties Mobile

Chart 6.3.3 illustrates the kind of information the students would like to receive by means of MyMaties Mobile. The largest number of responses was for the following information: general, test information, announcements, course, examination and administration information.

The following extracts, listed by themes, express the views of some of the respondents on what information should feature on the mobile service. It is important to note that the undergraduate respondents were more in favour of the mobile service than the postgraduate respondents.

- **Ability to customise**

“None, it must be a pull system, not a push system.” (Postgraduate respondent)

- **Administration**

“Financial statements.”

“Account details.”

- **Announcements**

“Important announcements, for example if the network will be down for a certain period.”

“Announcements from WebCT.”

- **Course information**

“When classes are cancelled or changed.”

“Class time tables; class venue information.”

- **Email**

“Server that allows your university email to be sent to your mobile phone as well.”

“None please! Only send stuff to my email!” (Postgraduate respondent)

- **Examination information**

“Exam results.”

- **General**

“Food bookings.”

“None. I do not wish to be spammed by the University.” (Postgraduate respondent)

“I must admit that I did not know about 50% of the services you are referring to, such as MyMatiesMobile. There are students who consider Facebook and twitter a waste of time, and I do not see how it matters to the student.” (Postgraduate respondent)

“Varsity Cup fixtures.”

“Did not know the University even had a mobile site.”

“Any information as long it is under the University curriculum.”

- **Test information**

“Test venues and reminders of tests in case it somehow slips my mind.”

Extent to which students agree or disagree with various statements regarding the student portal (Question 3.8.1 & 3.8.4)

Students were also asked to agree or disagree with various statements regarding the staff portal. The results depicted in Table 6.3.3.h show that the majority of students agree that:

- it is easy to find information on the portal (79%),
- the organisation (layout) of information is clear (74%),
- it is easy to search for information (60%), and
- the information available on the student portal is up-to-date (68%).

Extent to which students agree or disagree with various statements				
3.8.1 Easy to find		3.8.2 Organisational layout clear	3.8.3 Easy to search	3.8.4 Up to date
	Percent %	Percent %	Percent %	Percent %
Disagree	11	10	16	11
Average	11	16	23	21
Agree	79	74	60	68
Total:	100	100	100	100
				n=209

Table 6.3.3.h: Extent to which students agree or disagree with overall usability of the staff portal

6.3.4 Cross-tabulation between the independent categorisation variables and the dependent variables depicting student portal factors

In this section all the results that produced significant Chi-square results ($p \leq .05$) and Spearman Rank coefficients ($p \leq .05$) are presented.

6.3.4.1 Significant results for gender

Access by means of the student portal (*MyMaties.com*) to First Year's Early Support (Question 3.2)

The significant results for the cross-tabulation between gender and access to *First Year's Early Support* are depicted in Table 6.3.4.1.a. While 47% of the total population rated the *First Year's Early Support* function as 'very important', it can be seen that far more of the female students (57%) rated this function as 'very important' than the male students (35%).

Q 3.2 Access on MyMaties.com to: <i>First Year's Early Support</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	57%	17%	26%	100%
Male	35%	33%	32%	100%
Total:	47%	24%	29%	100%
				n=209
Chi-square: $p=.00262$; Spearman Rank R: $p=.00051$				

Table 6.3.4.1.a: Access to *First Year's Early Support* (Significant results for gender)

Access by means of the student portal (*MyMaties.com*) to *My Library* (Question 3.2)

The significant results for the cross-tabulation between gender and access to *My Library* are depicted in Table 6.3.4.1.b. It can be seen that while 62% of the total population rated the *My Library* function as ‘very important’, far more female students (71%) than male students (51%) consider this function to be ‘very important’.

Q3.2 Access on MyMaties.com to: <i>My Library</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	71%	19%	10%	100%
Male	51%	37%	12%	100%
Total:	62%	27%	11%	100%
				n=209
Chi-square: p=.00728 ; Spearman Rank R: p=.00593				

Table 6.3.4.1.b: Access to *My Library* (Significant results for gender)

Use of the Webmail function via the student portal (*MyMaties.com*) (Question 3.3)

The significant results for the cross-tabulation between gender and use of *Webmail* are depicted in Table 6.3.4.1.c. While 84% of the total population rated the *Webmail* function as ‘very important’, it can be seen that far more of the female students (90%) than the male students (77%) rated this function as ‘very important’

Q 3.3 Use of functions: <i>Webmail</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	90%	5%	5%	100%
Male	77%	14%	10%	100%
Total	84%	9%	7%	100%
				n=209
Chi-square: p=.03638 ; Spearman Rank R: p=.01322				

Table 6.3.4.1.c: Use of *Webmail* (Significant results for gender)

Use of the My Future function via the student portal (MyMaties.com) (Question 3.3)

With regard to the cross-tabulation between gender and access to *My Future*, the significant results are depicted in Table 6.3.4.1.d. While almost half of the of the total student population rated the *My Future* function as of 'little importance' (49%) the majority of male students consider it of 'little importance' (54%) whereas 45% of females consider it of 'little importance'.

Q 3.3 Use of functions: <i>My Future</i>				
Importance X Gender	Percent %			
	Very important	Average	Of little importance	Total
Female	24%	30%	45%	100%
Male	10%	36%	54%	100%
Total:	18%	33%	49%	100%
				n=209
				Chi-square: $p=.002076$; Spearman Rank R: $p=.004709$

Table 6.3.4.1.d: Use of *My Future* (Significant results for gender)

Extent to which the organisation (layout) of information is clear on the student portal MyMaties.com (Question 3.8.2)

The significant results for the cross-tabulation between gender and whether the *organisation of information* is clear are depicted in Table 6.3.4.1.e below. It is evident that far more female students (79%) than male students (67%) agree that the *organisation (layout)* of information on *MyMaties.com* is clear.

Q 3.8.2 Organisation (layout) clear				
Importance X Gender	Percent%			
	Agree	Average	Disagree	Total
Female	79%	16%	5%	100%
Male	67%	17%	16%	100%
Total:	74%	16%	10%	100%
				n=209
				Chi-square: $p=.002980$; Spearman Rank R: $p=.002669$

Table 6.3.4.1.e: Organisation of information (Significant results for gender)

From the above it can be seen that the female students held a more positive view on a number of aspects with regard to the student portal.

6.3.4.2 Significant results for study level

Access on the student portal (MyMaties.com) to Submission of Theses/Dissertations (Question 3.2)

The significant results for the cross-tabulation between study level and access to *Submission of Theses/ Dissertations* are depicted in Table 6.3.4.2.a below. It can be seen that while the majority of the postgraduate students (57%) rated this facility as ‘very important’ only 31% of the undergraduates held a similar view.

Q3.2 Access on MyMaties.com to: Submission of Theses/ Dissertations				
Importance X Study Level	Percent %			
	Very important	Average	Of little importance	Total
Undergraduate students	31%	18%	51%	100%
Postgraduate students	57%	27%	16%	100%
Total:	36%	20%	44%	100%
				n=209
				Chi-square: p=.00061 ; Spearman Rank R: p=.00017

Table 6.3.4.2.a: Access to *Submission of Theses/ Dissertations* (Significant results for study level)

Access on the student portal (MyMaties.com) to My Library (Question 3.2)

The significant results for the cross-tabulation between study level and access to *My Library* are outlined in Table 6.3.4.2.b below. It is clear that a far higher percentage of the postgraduate students (81%) than undergraduate students (58%) rated this function as ‘very important’.

Q3.2 Access on MyMaties.com to: My Library				
Importance X Study Level	Percent %			
	Very important	Average	Of little importance	Total
Undergraduate students	58%	31%	11%	100%
Postgraduate students	81%	11%	8%	100%
Total:	62%	27%	11%	100%
				n=209
				Chi-square: p=.02607 ; Spearman Rank R: p=.01596

Table 6.3.4.2.b: Access to *My Library* (Significant results for study level)

Access on the student portal (MyMaties.com) to Class Group Allocation (Question 3.2)

The significant results for the cross-tabulation between study level and access to *Class Group Allocation* are outlined in Table 6.3.4.2.c. It can be seen far more undergraduate students (72%) than postgraduate students (51%) rated the *Class Group Allocation* function as ‘very important’.

Q3.2 Access on MyMaties.com to: Class Group Allocation				
Importance X Study Level	Percent %			
	Very important	Average	Of little importance	Total
Undergraduate students	72%	14%	15%	100%
Postgraduate students	51%	16%	32%	100%
Total:	68%	14%	18%	100%
				n=209
				Chi-square: p=.02424 ; Spearman Rank R: p=.00939

Table 6.3.4.2.c: Access to Class Group Allocation (Significant results for study level)

Access on the student portal (MyMaties.com) to My Academic History (Question 3.2)

From the significant results in Table 6.3.4.2.d it can be seen that far more of the postgraduate students (92%) rated the *My Academic History* function as “very important” than the undergraduate students (73%).

Q 3.2 Access on MyMaties.com to: My Academic History				
Importance X Study Level	Percent %			
	Very important	Average	Of little importance	Total
Undergraduate students	73%	19%	8%	100%
Postgraduate students	92%	3%	5%	100%
Total:	76%	8%	16%	100%
				n=209
				Chi-square: p=.03237 ; Spearman Rank R: p=.01001

Table 6.3.4.2.d: Access to My Academic History (Significant results for study level)

Use of My Test/Exam Information function (Question 3.3)

The significant results for the cross-tabulation between study level and use of *My Test/Exam Information* are depicted in Table 6.3.4.2.e below. It can be seen that far more of the undergraduate students (81%) than postgraduate students (59%) rated this function as ‘very important’.

Q 3.3 Use of functions: My Test/Exam Information				
Importance X Study Level	Very important			
	Very important	Average	Of little importance	Total
Undergraduate students	81%	13%	5%	100%
Postgraduate students	59%	5%	35%	100%
Total:	78%	12%	11%	100%
				n=209
Chi-square: p=.00000 ; Spearman Rank R: p=.00049				

Table 6.3.4.2.e: Use of *My Test/Exam Information* function (Significant results for study level)

Use of My Official Documents function (Question 3.3)

The significant results for the cross-tabulation between study level and use of *My Official Documents* are outlined in Table 6.3.4.2.f below. It can be seen that far more of the postgraduate students (68%) valued this attribute than their undergraduate counterparts (43%).

Q 3.3 Use of functions: My Official Documents				
Importance X Study Level	Percent %			
	Very important	Average	Of little importance	Total
Undergraduate students	43%	38%	19%	100%
Postgraduate students	68%	19%	14%	100%
Total:	47%	35%	18%	100%
				n=209
Chi-square: p=.02218 ; Spearman Rank R: p=.01731				

Table 6.3.4.2.f: Use of *My Official Documents* function (Significant results for study level)

From the above it can be seen that the difference between the student category views on the University’s portal features related to their specific study needs, e.g. the postgraduate students

held a more positive view on portal features such as official documents and thesis progress, while the undergraduate students were more positive with regard to class allocations and examination timetables.

6.3.5 What are the likes and dislikes of the student portal? (Question 4.1 & Question 4.2)

The responses to the open-ended Questions 4.1 and 4.2 were for analysis purposes divided into positive ('likes') and negative ('dislikes') responses and grouped into the following student portal feature categories: information (including relevance and currency of information), user-friendliness, design and layout (including visual design and labelling), overall search/find features, navigation and those comments with regard to technical concerns.

Information

With regard to information available on the portal, more student respondents considered the information to be helpful than those who expressed concerns about the fact that the information was outdated or no longer relevant. A number of students provided pertinent comments in terms of their 'likes' or 'dislikes'.

Likes:

"Easy access to information (academic and general).

"Information is always up to date."

"The vibrancy and good summarisation of all important information and links."

Dislikes:

"Sometimes the same article has been on the home page for too long."

"It does not give you all the necessary information"

"Not updated regularly."

User-friendliness

The viewpoints of the respondents who provided comments on the user-friendly questions were mostly positive. A few respondents, however, considered the portal to be less user-friendly. The following extracts reflect these viewpoints:

Likes:

"It's is student-friendly and has all the necessary information about my university/studies."

"It has all the things that a student may need at anytime without running around looking for them e.g. exam results, library searches, financial statements, etc."

“One portal for information!”

Dislikes:

“The structure, layout, responsiveness (very slow), usability, etc.”

Design and layout

Respondents who provided feedback on the design and layout of the portal were divided in their views on the issue. While some students liked the advertisements and uncomplicated layout of the portal, other respondents considered the portal to be cluttered.

The following comments illustrate their viewpoints:

Likes:

“I love how it's informal and has different adverts and articles that pop up on the home page.”

“The pictures in the header.”

“The simplicity of the layout of the links.”

Dislikes:

“The adverts get a little annoying.”

“...Website is poorly laid out. Colour scheme needs work.”

“UI design is cluttered...”

Navigation

Respondents who commented on the overall navigation of the portals were almost equally divided in articulating their views on the ‘likes’ and ‘dislikes’ of the portal.

Likes:

“I like the fact that it is easy to navigate.”

“Links are straightforward.”

“Navigation of the site is fairly simple.”

“The fact that for most of the services on MyMaties.com there are alternative links and I don't have to use the actual site.”

Dislikes:

“Categories are not always that clear in terms of the sub-links that they contain.”

“... the amount of links you have to click before you actually reach the service you want and the amount of services clogging the UI that I don't actually use...”

Searching

In terms of searching¹³, more than half of the respondents who commented believed that it was difficult to find information.

The following pertinent comments illustrate the concerns respondents have:

“Finding some documents is confusing. I have difficulties in locating the proof of registration documents.”

“The ‘find’ tab. I always struggle to find what I am looking for.”

“When I have to search for something.”

“It is not always up to date and I find it difficult to find things.”

Technical issues

More than half of the respondents who commented on this feature addressed various technical difficulties they experience with regard to the portal. A few respondents, however, made positive comments. The following pertinent comments reflect the divergent opinions of the respondents:

Likes:

“I like the WebCT portal and Webmail accounts. It is a very convenient way of getting my notes, and I can keep my personal email account separate from my university account.”

“Being able to see important information from home.”

Dislikes:

“... Lack of support for browsers other than Internet Explorer. Inability to access my storage drives properly...”

“... the instability, the slow speed, and the amount of links you have to click before you actually reach the service you want, and the amount of services clogging the UI that I don't actually use.”

6.3.6 Changes or comments with regard to the University’s website or portals (Question 4.3 & Question 5)

Comments with regard to Question 4.3 and Question 5 were grouped together as the themes identified in terms of the coding scheme were similar. The main aspects (which showed some commonalities with the responses to questions 4.1 and 4.2) highlighted included the following:

- increase use of social networks,
- make it more mobile-friendly,

¹³ The search function is labelled as “Find” on the student portal.

- update the home page articles,
- should be fully compatible with *Firefox/Google Chrome*,
- allow for the customisation of links most often used by users,
- provide easier access to test results,
- build the website on a proper content management platform and design the user-interface to be intuitive,
- place popular links at the top of the page and make good use of space to keep the website looking uncluttered,
- integrate the food hall menus with the meal booking system to simplify the booking procedures,
- documents are sometimes outdated, e.g. *Fees*,
- update the news on the website more regularly,
- improve the layout,
- create page that explains in detail what all the different tabs and pages on the site are used for, especially with reference to ease of use for first-year students,
- keep information up to date,
- modernise the layout (simplified user interface with less clutter or advertisements and increased font size.),
- enhance it to be more colourful and inclusive, as opposed to a website with countless links,
- publish a University calendar (term dates, events, sport, societies) that can be accessed and integrated with *GoogleCalendar* or *Outlook Calendar*, and
- more information needed regarding things that happen on Campus.

6.4 Interviews

This section relates to the analysis of the semi-structured interviews that were conducted with three key stakeholders with regard to the University website and portals. The stakeholders were selected from the information technology, management (institutional solutions management) and web publishing (web programmer) sections (cf. Appendix E & F). The interviews¹⁴ focused on issues regarding the overall management of the content management project, challenges in connection with information technology, as well as issues relating to the authoring and publishing of content. The objective of the interviews was thus to obtain a more in-depth understanding and insight into the area under investigation.

¹⁴ All comments or quotations were, where relevant, translated from the Afrikaans text.

6.4.1 The value of the current portals and the need for a content management system (Questions 2.1 & Question 3.1)

The first aspect dealt with during the interviews was to get an understanding of current portal practices and obtain the stakeholders' views of their experiences with the portals (cf. Question 2.1, Appendix E & F).

All three interviewees felt that the current portal technology was outdated in terms of the University's needs. The following statement made by one of the interviewees succinctly captures their views:

"It's not meeting my expectations... Fundamentally it is eight years old. There has been a lack of, I would say, technical leadership... Nothing you design the first time will last for ever...It's been an eight-year implementation process..."

Another negative aspect that was raised was the lack of integration with other systems on campus. The following comment succinctly captures this view:

"For example, if I go to my loan record via the portal, I cannot review my books. Then I have to go to the library portal to search for the place where I can borrow or renew books; again: should I need to go to interlendings, I find it a mission to get there."

A positive aspect that was raised by an interviewee (who uses the portals both as a student and as a staff member) was the feature that allowed one to view current student records and marks as well as the ability to personalise the user-interface. In addition, the HR-type functionality was seen as useful in the administration of staff-related issues. This positive aspect was also highlighted in the responses relating to the staff portal (cf. 6.2.5).

In response to Question 3.1 (Appendix E), which required interviewees to comment on the need for a content management system on campus, one of the interviewees indicated that the inclusion of enhanced features and functionalities that are constantly being developed into a content management system would be its biggest advantage. In contrast to static HTML websites, content management systems allow for the dissemination of content from various information technology systems. A further argument that was put forward in favour of introducing a content management system was that it allowed for the automation of various processes and that this could address many labour-intensive activities. The following translated quotation summarises this issue:

“You cannot do this with a more conservative HTML website... It is important that all student information e.g. marks, timetables, residence information, etc. should be available to the students. The University has a meals booking system, and all of these [systems] are now electronic. It cannot really operate properly other than with a CMS.”

In addition, the following emerged from the interviews on why the University needs a content management system:

There is a need

- for the overall management of content,
- to analyse what is important to users,
- to determine the frequency and extent of use of particular content,
- to address retention, i.e. the content life cycle,
- to eliminate duplication,
- for version control (Does the University know when content changes?), and
- to publish different subsets of content to external and internal sources.

A positive aspect that emerged was the fact that the University has instituted a portal committee. The main task of this committee is to investigate and shed light on issues relating to the current portals in use, the people who use them and the integration of various information management systems on campus.

The issues and comments in this section provide a clear indication that there is a need at the University to manage content and to understand users' information requirements.

6.4.2 Layout and design (Question 2.2 & Question 2.3)

As with the design and layout of websites, the design and layout of content management systems are of major concern to stakeholders. Rosenfeld and Morville (1998, p. 2) recommend that brainstorming groups be put together to discuss their “hates” and “likes” of the current website / portal. Similarly, the interviewees were prompted to indicate what they ‘liked’ and ‘disliked’ about the design and layout of the current staff and student portals.

An important negative aspect that emerged during the interviews was that the layout of information appears to be cluttered. Two of the interviewees, for example, commented on the

fact that the topics covered are too wide-ranging and that this results in a very complicated navigation pane to the left of the staff and student portals. A further disadvantage is that important information is often hidden in sub-links, which further impedes navigation. All three interviewees further commented on the ineffectiveness of the current search features.

“If I search I do not find what I am looking for. I know it is somewhere, but I do not find what I am looking for.”

“When I log into the information portal, because I want to go and find something, there must be a big search bar.”

Another key issue raised by one of the interviewees is the lack of consistency in the design of the student and staff portals. The interviewee identified a need for an information technology policy and procedures manual, as well as specifications to guide the design of portals.

“The other thing is the student portal... Where the portal has to integrate with other systems there is no consistency with the design of the other systems.”

“People’s forms do not look the same in the way in which they are presented ...each department has its own identity.”

One interviewee commented that the single point of entry to the portal is a very positive attribute and this makes the portal very user-friendly and personalised.

“I like the fact that there is a portal. I like the fact that there’s a single sign-on. I want to find information in the portal that is up to date and is applicable to my functions at the University.”

6.4.3 What information should or should not be published to the staff and student portals? (Question 2.4 & Question 2.5)

Rockley et al. (2003, p. 3) have suggested that, content is the “lifeblood” of an organisation and crucial to its users (cf. also Chapter 2). Stakeholders were therefore prompted to indicate what important information, i.e. content is currently not available on the portals, or which should in future not be published to the staff or student portals. The interviewees, however, did not provide specific feedback relating to these issues. One of the interviewees, however, indicated that the University should create post for a metator¹⁵ to assist in the information architecture of the content management system implementation process. There is clearly a need to conduct a full content audit to clarify these issues (cf. Chapter 3).

¹⁵Boiko (2005, p. 227) sees the role of a metator as someone who works with the information architecture staff to create a metatorial framework, thus to review content to assign metadata fields and train and guide other staff.

Another key aspect that emerged during the interviews is the need for the University to address the overall information architecture of the portals' interfaces before migrating to the proposed content management system.

More specifically, a need was expressed for the various departments to revisit and consider the labelling and positioning of links. There is a need to create user-friendly links and labels for the staff and student portals instead of links and labels that the designers perceive to be important. The following comment clearly captures this viewpoint:

"You need to have a holistic approach. The students don't want to go to your site to read about it, they want to see it in their space, their context."

One of the interviewees further mentioned that there is a need for additional functionality that would assist users (i.e. staff or students) to find information relating to the University's policies and other regulatory information. Such mechanisms could include the use of micro-blogging where people post and respond to queries.

"If you provide a facility where you can find the person who knows most about the type of topic, it's much more valuable."

6.4.4 What features would you like to see available in a content management system? (Question 3.2)

Interviewees were asked to comment on the important features or functionalities that should form part of the content management system. Owing to the wide variety of available content management products and features, the feedback that was provided was, understandably, varied. However, what came out strongly was the fact that the interviewees were of the opinion that the content management system should be implemented in a staggered way and that functionalities and features should be rolled out incrementally as the need to expand arises. The following comment succinctly summarises this view:

"I foresee that nothing at the University will always be a big bang. So there will definitely be a staggered approach."

The possible mismatch between users' needs and designers' views regarding the necessary features and functionalities of a content management system was another aspect raised by an interviewee. The following comment captures the complexity of the situation incorporated:

"For instance, you cannot expect the content management system that you bought for the organisation, for instance for admin, to be able to handle the content of a learning management system..."

One interviewee specifically stressed that is important for the University to have a more holistic approach when considering which content management features to utilise. There has been a technological change in the way people communicate and network and this would influence the way in which students like to receive information. The following comment clearly expresses this viewpoint:

“The portals will change to be more of a mix... I think we are going to have to integrate with students ‘needs. Students are on Facebook, so we’ll have to provide an interface on the portal to Facebook.”

6.4.5 What problems could impede the successful implementation of a content management system? (Question3.3)

Stakeholders were asked to give their views on factors that could impede the successful implementation of a content management system at the University. A number of key issues emerged and are outlined below:

- **Integration challenges** generally associated with the implementation of an information system, i.e. how does one integrate and configure a content management system with other systems on campus?

“There are always challenges with new technology. It has to interact with the University’s existing systems, e.g. financial systems, student records... and to integrate the data seamlessly will always be a challenge.”

- **Lack or limitation of resources** available for the successful implementation of such a system on campus.

“We don’t have the funding. We don’t have the knowledge or skill. IT needs to be trained and the users’ expectations are very high.”

- **Getting a mandate** to go ahead with the project. This entails buy-in from top management.

“IT does not have a mandate to tell the University what technology they must use... It should not be an IT driven [process]. The only way you are going to make this successful is if Management feels it is part of the strategic objectives.”

- **Perceived value of content management systems.** Different people have different viewpoints of the functionality and purpose of a content management system.

“The value of a content management system is also perceived differently by different people. [Some] individuals might just want to do a search. They don’t care about content management. When you talk about content management, you talk about issues that you cannot always quantify. How do you tell a person [that] content differs?”

6.4.6 What preferences or requirements do you have for a publication deployment platform? (Question 3.4)

Several studies recommend that content management implementation teams address the type of publications an organisation currently produces and expect to create as part of the new system (Boiko, 2005). The interviewees were therefore encouraged to provide feedback on possible requirements with regard to the publication functions of a content management system and best ways to deploy information. The core issues that were emphasised by most interviewees was the need for the University to

- strategise and disseminate content effectively,
- create and deploy appropriate chunks of content to different users,
- control access levels,
- implement a retention and/or destruction policy, and
- most importantly, not duplicate content.

A further comment related to the need for a publication platform to be user-friendly to those authors who wish to publish to the system. If the platform is not user-friendly training becomes a complicated task and users (authors) feel frustrated, especially where departments take ownership of web content and content is only updated sporadically.

The following quotation illuminates this point:

“Many [authors] understand what it is about, but they do not see their way clear to come for training. They feel they will not be sufficiently experienced to do this... They want to give it back to IT to do.”

6.4.7 Authoring (Questions 3.5.1 to 3.6.4)

Authoring is a complex issue and interviewees were therefore asked to comment on the current content authoring practices at the University. One of the interviewees mentioned that there is often no awareness of authoring initiatives on campus because of the varied nature of the University’s functions and decentralised environment. For example, the department that is responsible for the corporate website and staff and student portals receives information in MS

Word, e-mail and other formats from various entities on campus and at present all this information has to be changed to HTML format.

The University does not currently have a reviewing¹⁶ structure that is typically found in content management driven processes. The University is however in the process of developing authors' standards and guidelines to complement authoring processes currently being followed.¹⁷ For example, editing is generally done by a moderator and most departments follow the authoring guidelines outlined on the University website. The University is also investigating and developing standards to manage institutional documents through the implementation of file plans and guidelines for the management of financial, policy and other regulatory documents.

6.4.8 Information technology (Questions 3.7.1 to 3.7.6)

In response to the information technology issue in general, it was mentioned that some the core issues that the information technology group have to face are obtaining a mandate and collaboration from a dispersed environment and selecting, managing and deploying new technology on campus:

"Information Technology has a dual role of trying to promote new technology that will help the University – and then we need to almost "sell" it.

"They [Departments] may go to an external party and have a discussion and see a good presentation and get sold...sometimes they involve IT or, if they get the funding, they buy it and then say, 'IT, we've got this product and you need to support it.' There was no overarching technology. There is now, and [we] are in the process of creating a technological committee that makes these decisions..."

"For a content management system that needs to [access] the content that students want, you need to have the curriculum system [release] its content. ...It needs to be integrated, and the content management system should 'pull' from there and publish it in a way the user wants to see it."

"My point is that I think that the...people involved... don't see the benefit of exposing content [so] that they might not commit resources... So that is a point of negotiation that needs to take place..."

"We've got a stack of Oracle technologies that haven't grown and are difficult to grow. It's difficult to migrate, it's difficult to improve, continuously improve. But, it wouldn't necessarily impede the implementation of a content management system;

¹⁶ Reviewing entails the approval process; types of reviewers may include subject experts, quality assurance staff, compliance staff and lawyers (Rockley et al., 2003, p. 96).

¹⁷ This document was not completed at the time of the writing of this dissertation and the researcher therefore could not gain access to it.

even the current technology will still provide you with the necessary information to do content management.”

Interviewees were then asked to specifically give their views on the processes that need to be followed in adopting new technologies on campus and with which existing technologies the content management system should be integrated. They were finally asked to comment on problems they experience with existing technology.

Interviewees listed, amongst others things, stakeholder forums as a means to address these issues and also to advise management on topics related to information technology. For this reason the Portal Committee was constituted to act as a forum for the implementation of a content management system on Campus. This committee consists of role players selected from various departments on the main and satellite campuses, the library, as well as stakeholders in the research, corporate communication, marketing and information technology departments. Recommendations are made by the committee to management, and one such recommendation was the proposal that a phased approach to the implementation of a content management system should be followed.

Further information technology related comments that affect content management implementation have been grouped into cognate themes and outlined below:

- Individual websites should migrate to a web content management system to ensure that content is disseminated from a central repository. This will result in more control and a reduction in the number of staff members who need technical knowledge with regard to JavaScript, HTML, etc.
- The portals should be adapted to accommodate a more varied approach, e.g. provide an interface with Facebook.
- The content management system should consist of a variety of technologies (web, records and document management) and it would need to integrate with existing systems on campus, e.g. the finance and curriculum systems.
- It may be difficult to migrate current technologies to the content management system.
- There is a need for a digital publishing system to accommodate the publishing of yearbooks and other PDF documents on demand.
- It will become a requisite to comply with government requirements with regard to records management (South Africa. Department of Public Enterprises, 2002, p. 38).

6.4.9 Users of the portals (Questions 4.1 to 4.3)

Interviewees were requested to identify who they consider to be the main users of the portals and to comment on areas that they feel are not meeting the needs or expectations of these users. All three interviewees stated that students were the largest user group of the University's portals. Two core problem areas that they felt that students faced and which should be remedied were the students' specific technological needs and network speed. The technological issue is captured by the following comment:

"They want content to be published to Facebook. You also publish content to iPads. So students' needs are scattered...they want you to meet them at their world. Students don't want to see content on a website. They have their technologies [...] Content should also be publishable to all types of platforms."

The specific needs of staff were also mentioned and it was pointed out that many staff users have expressed the need to access different types of content that are currently not readily available. Particular emphasis was placed on the need that staff have to access to business-related information.

In conclusion, the interviews with the three stakeholders highlighted the core issues of concern regarding the implementation of a content management system at the University. The key areas that emerged suggest that the University needs to put authoring, information technology and publishing standards and strategies in place to launch an effective content management system. The closing chapter (Chapter 7) will provide recommendations and pointers that could assist in the development of a unified strategy for the successful implementation of a content management system at Stellenbosch University.

CHAPTER 7

FINDINGS AND RECOMMENDATIONS

7.1 Introduction

According to Stewart et al. (2008, p. 3) the success of a content management system is directly related to whether an organisation has a clear “vision” of what the system should achieve. They further warn that in the “absence of a coherent and achievable vision, the technology might take over and the original institutional needs will become lost in the technical nuances of the application.” Rockley et al. (2003) affirm the notion that content management is not only about the technologies involved, but also about the specific nature of an organisation, the content within the organisation, and the people and processes within the organisation. It is thus evident that successful content management system implementation depends on the extent to which developing teams not only consider technical aspects, but also investigate the content, business processes, as well as stakeholder and user involvement and needs.

The researcher was therefore motivated to gain an understanding and a perception of the views of stakeholders and users with reference to the current websites and portals available on Stellenbosch University Campus. In addition stakeholders were also asked to give their views why the University wanted to migrate to a content management system. To meet these objectives the study was guided by the following main and secondary research questions (cf. Chapter 1):

Main research question

How can the Stellenbosch University address the website and portal information needs of its users through the implementation of a content management system?

Secondary questions

What are the content needs of the various segments of users of the Stellenbosch University?

What strategies or policies should be in place for the effective implementation of a content management system?

What contribution does this study make to the tertiary education environment in general?

This chapter is based on the findings in Chapter 6, and the intention is to draw conclusions from the findings and indicate how Stellenbosch University can address the website and portal information needs of its users through the implementation of a content management system.

7.2 Summary and comments

In this section, the main findings of the data analysis of the responses of the staff and student questionnaires will be outlined.

7.2.1 Staff questionnaire

7.2.1.1 Demographic information

The demographic profile for the staff population was established by considering gender, age, employee affiliation, and how employees were distributed amongst facilities as well as the administration and services category (cf. Table 6.2.1.a – cf. Table 6.2.1e). With regard to gender, more female staff completed the questionnaire than their male counterparts. The outcome is not unexpected as the employee affiliation shows that the majority of respondents belonged to the administrative and services staff and this category more often than not consists of female staff. With regard to the age distribution a large section of the respondents were in the younger age category (under 40) than the older age categories. The reason for the former could be that younger staff are more inclined to engage with information technology and thus more interested in responding to the questions. The former distribution could be that older staff might be more conscientious about assisting with developments.

In addition, respondents were also asked to indicate whether they were affiliated to a faculty or an administration and services division. With regard to employee affiliation it was seen that a surprisingly high number of respondents were from the Health Sciences Faculty. As mentioned in Chapter 6, a number of staff from the Tygerberg Campus, where the Health Sciences are situated, indicated that they frequently experience problems with regard to connectivity to the staff portal and this concern could explain the higher response rate in comparison to other faculties.

With regard to the administration and services divisions the highest number of responses was received from staff within Academic Administration, Academic Support and Information Technology. The higher response rates for these divisions could be attributed to the fact that staff from these divisions are required to interact more frequently with the portal because of their work-related activities.

7.2.1.2 Interaction with the Stellenbosch University main website

The purpose of this section was to ascertain the extent of use and overall satisfaction with the Stellenbosch University's corporate website (cf. Table 6.2.2.a - Table 6.2.2.b). Most respondents indicated that they use the corporate website on an 'average' or 'very frequently' basis, which is a clear indication that website use has become an integral part of their daily tasks. An encouraging outcome was that the majority of staff indicated that they were satisfied with the current website.

7.2.1.3 Interaction with the Stellenbosch University staff portal

This series of questions specifically addressed the frequency of use and overall interaction with the staff portal as opposed to the website. It was seen that the responses obtained were identical to that of the corporate website. As mentioned in Table 6.2.3.a the similarities could be attributed to the fact that the staff sign-in is initiated from the corporate website and consequently perceived by staff as the same interface.

The respondents were firstly asked to rate the importance of having access to the various links on the staff portal (cf.6.2.3.b), viz.: *Teaching and Learning, Research, Community Interaction* and *For Management*. The majority of respondents considered the *Teaching and Learning, Research* as well as *For Management* links as 'very important'. The results are not surprising, bearing in mind that within the higher education context, teaching and research are fundamental functions.

The respondents were further asked to rate the importance of having access to various sub-links within the *Teaching and Learning* and *Research* sub-links link (cf. Table 6.2.3.c - Table 6.2.3.d). With regard to the former, access to the *University Calendar* was the only sub-link with a large response rate of 'very important' (56%). With regard to the *Research* sub-links (cf. Table 6.2.3.d), 55% of respondents considered access to *Library Support* as 'very important' followed by access to *Research Support Tools* and *Research@Stellenbosch* (46% each). These results underscore the fact that these sub-links are fundamental to university staff and support their teaching and research goals.

The comments provided by the respondents with regard to the *Community Interaction* and *For Management* sub-links (cf. Table 6.2.3.e - Table 6.2.3.f) indicated that the respondents' views were equally divided between the three levels of importance (i.e. very, average or little). A similar result was provided for the *First-year Academy Monitoring System* link where it was seen that respondents rated the 'little importance' and 'very important' levels of importance equally.

In contrast, more than half of the respondents viewed it 'very important' to have access to the *My Management Information* sub-link.

The respondents were further asked to rate the extent of use of certain functions available on the staff portal (cf. Table 6.2.3.g). The functions used most often were the university's e-HR functions, email and password self-management and those pertaining to policies and procedures. The respondents were, however, less positive with regard to the sharing and management of documents (equally divided amongst the very, average and little response categories). The results suggest that HR and policy-related information plays an important role and integral part of staff activities on Campus.

With regard to the extent to which staff have customised or personalised their portal accounts (cf. Table 6.2.3.h), the results show that the *My Profile* feature was the only function staff perceived as of 'average' importance. One possible explanation for this disinterest is that staff are not aware of the value of the personalisation feature in providing access to relevant university-related information.

The final series of questions addressed the perceptions of the staff with regard to the comprehensiveness, ease of use, findability, etc. of information (cf. Hackos' (2001) basic requirements). It can be seen from the summary of responses below that the staff generally held very positive views with regard to these factors (cf. Table 6.2.3.i). The majority of the respondents:

- were of the opinion that it was easy to find information on the portal (72%),
- that the organisation (layout) of information was clear (67%),
- that it was easy to search for information (58%), and
- that the information available on the staff portal was up-to-date (72%).

7.2.1.4 Examination of the effects of the independent variables

The results in the previous section were further analysed by cross-tabulating them with the independent variables (i.e. age, gender, employee affiliation, and the faculty or administrative division categories) and testing the results for significance, i.e. whether they provided significant Chi-square statistics. The significant cross-tabulation with a p level $\leq .05$ are discussed below (cf. Table 6.2.4.1.a – Table 6.2.4.3.f).

7.2.1.4.1 Significant results for gender

It was seen that the female staff were more positive than their male counterparts about accessing the *Library Support* and *Boschtelegram* (i.e. the Online staff newsletter) links (cf. Table 6.2.4.1). Research concerned with communal social relationships and a conversational focus have shown to be more characteristic of females, which could be a possible reason for the significant results for *Boschtelegram* (Ellis, 2008, p. 689).

7.2.1.4.2 Significant results for employee affiliation

The cross-tabulation between employee affiliation and various links, sub-links and functions produced several significant Chi-square results (cf. Table 6.2.4.2.a – Table 6.2.4.2.e). Clear differences were observed between the academic / research staff and the administrative staff. It was not unexpected that more of the academic / research staff considered access to *Teaching and Learning* and *Research, Timetables, Research Support Tools* as well as the *My Library* function as ‘very important’ than the administrative staff. These activities clearly have a more direct relevance to their university activities than to the administrative staff.

7.2.1.4.3 Significant results according to whether staff held an academic/research or administrative/services post

The cross-tabulation between the category of post held and the various links, sub-links and functions produced several significant Chi-square results (cf. Table 6.2.4.3.a – Table 2.4.3.f). It is once again not unexpected that more academic staff perceived access to *Teaching and Learning, Manage Students, Exam/Test Information* and *Timetables* as more important than the administrative / services staff. This again can be related to their specific functions in the university.

7.2.1.5 Positive and negative views with regard to the staff portal

In this section an outline is provided of the perceptions that the staff have of the most significant positive and negative attributes of the staff portal (cf. 6.2.5).

With reference to the attributes the respondents ‘liked’ most, it clearly surfaced that the staff were positive about the availability of a portal as a means to provide access to information relevant to their functions at the University. They further considered the portal to be user-friendly.

A distinctive theme that emerged from the ‘dislikes’ replies was that the staff thought that the portal contained too much information, that it is very congested, and that the layout is

disorderly and outdated. It is therefore difficult to trace information about HR-related matters and relevant policies and procedures that apply to them and such categories of information should rather be published to a particular location where it could be updated on a more regular basis. The large number of subdivision [links] meant that important information was often buried several levels down and this impeded navigation. It was further frequently stated that the search feature was not particularly efficient. Other technical factors that the staff found problematical were the slowness and instability of the system, problems with availability of the portal on satellite campuses, e-HR features and the overall interaction with other interfaces on campus.

These negative views could possibly be explained by comments made during the stakeholder interviews where it was stated that the current portals run on an 'out-of-date' platform.

7.2.1.6 Changes or comments with regard to the University's main website or portals

The final series of questions offered staff the opportunity to suggest changes to the corporate website or staff portal. The suggestions and comments provided were very similar to the 'positive and negative' responses outlined above. (cf. 7.2.1.5).

The staff were in general very positive about the overall ease of use of the staff portal particularly with regard to HR-related functions. On the other hand, a number of staff expressed concern with regard to the instability of the portal, especially with reference to the manner in which the portals correlate with other information management systems in use. Other factors were problems with connectivity and the subsequent 'slowness' of the portal when accessed from satellite campuses. The staff further considered it complicated to find policies, procedures and research related documents on the current portal and a number of staff suggested that all policy documents be incorporated within a particular and distinct link.

All these suggestions should be seriously considered and incorporated in a content management strategy document.

7.2.2 Student questionnaire

7.2.2.1 Demographic information

The demographic profile for the student population related to gender, age, level of study and faculty of study. With regard to gender, more female students completed the questionnaire than their male counterparts. With regard to the age distribution a larger section of the respondents were in the younger age category (under 20), than in the older age categories. In addition, more

undergraduate students completed the questionnaire than their post-graduate counterparts. The age distribution and study level are obviously related. The majority of students at any South African university are at the undergraduate level and these would also mostly be the younger students.

The distribution by faculty of study indicated a higher response rate for students from the Arts and Social Sciences and Health Sciences Faculty than the other faculties. The latter distribution could, similar to the staff respondents (cf. 7.2.1.1), be partially attributed to the fact that students and staff at the Tygerberg Campus highlighted the problems they have with accessing the portal.

7.2.2.2 Interaction with the Stellenbosch University website

It was seen that (cf. Table 6.3.2.a - Table 6.3.2.b) the majority of students do not use the University website 'very frequently'. This can possibly be attributed to the fact that the information contained on the website is not sufficiently relevant to their needs. A large proportion of students were however satisfied with the website and this could suggest that the appreciation of a website is not necessarily linked to usage or that they had answered incorrectly (the latter is the more probable reason, given the outcome discussed in 7.2.2.3).

7.2.2.3 Interaction with the Stellenbosch University student portal

It was seen that in contrast to their use of the website, the majority of students use the portal on a 'very frequently' basis (cf. Table 6.3.3.a). This anomaly in the responses to these two questions suggests that most students do not realise that they cannot access the portal other than by means of the website. It would, however, appear that the portal contains information that are very important to the students' activities on Campus.

Students were further asked to provide feedback on the importance of having access to certain links and sub-links (cf. Table 6.3.3.b). The results of the questions indicated that the majority of students considered it 'very important' to have access to the links *Module Time Distribution, Term Dates, Venue Distribution, My Test/Exam Information, My Academic History, Class Group Allocation, Programmes, Manage Print Credits, My Library* and *My Faculty*. These results suggest that students appreciate having access to information that is relevant to the 'management' of their daily activities on Campus.

It was further seen that the majority of students considered it 'very important' to have access to *Webmail* (cf. Table 6.3.3.c). One could reason that students would naturally consider it

important to stay in touch with staff to seek assistance or to communicate with other students with regard to their curriculum or other activities. A surprising result for this category is that students consider it of 'little importance' to have access to the *Find* feature. This could possibly be explained by the comments provided where both students and staff remarked on how difficult it is to search for information on the portals. The other link that the students did not consider important is where they can customise resources available from the student portal (cf. Table 6.3.3.d).

It was further very surprising to see that the majority of respondents indicated that they did not make much use of the *MyMaties Mobile link* (cf. Table 6.3.3.e.). The students, however, indicated that it was 'very important' for them to have access to certain of the specific information that is available by means of the mobile service (e.g. *Exam results, Exam Time Table Distribution, and Exam Venues*). The comments that were provided indicate that this service was mostly used by undergraduate students and that these students like to use this method to access information relevant to their courses and tests. Mobile-related computing has become pervasive in today's online environment and it is suggested that the undergraduate students would in particular benefit from this method of content delivery.

The final questions in this section related to the students' views relating to the completeness, ease of use and findability of information (cf. Hackos' (2001) basic requirements). A summary of the responses is outlined below (cf. 6.3.3.h):

The majority of students were of the opinion that

- it is easy to find information on the portal (79%),
- the organisation (layout) of information is clear (74%),
- it is easy to search for information (60%), and
- the information that is available on the student portal is up-to-date (68%).

7.2.2.4 Examination of the effects of the independent variables

The results in the previous section were further analysed by cross-tabulating the independent variables (i.e. age, gender and study level) and testing them for significance. The results for each significant cross-tabulation that produced significant results are outlined below (cf. Table 6.3.4.1 a – Table 6.3.4.1.f).

7.2.2.4.1 Significant results for gender

The results indicate that far more female students than male students regard it to be very important to have access to the *First Year's Early Support*, *My Library*, and *Webmail* links on the student portal. A greater number of female than male students also thought that the organisation of information is clear (cf. Table 6.3.4.1a - Table 6.3.4.1e).

The reason for these differences might possibly be explained by gender research conducted by Ellis (2008) where he concludes that females are more likely than men to obtain social support and seek help when facing some sort of unfamiliar task. Ellis further concludes that they are also generally more conscientiousness (Ellis, 2008) and more concerned with communal social relationships.

7.2.2.4.2 Significant results for study level

It was seen in Table 6.3.4.2.a, Table 6.3.4.2.b, Table 6.3.4.2.d and Table 6.3.4.2.f that far more post-graduate than undergraduate students thought that it is very important to have access to the *Submission of Theses/Dissertation*, *My Library*, *My Academic History* and *My Official Documents* links on the MyMaties student portal. Undergraduates were again more interested than postgraduate students in gaining access to the *Class Group Allocation* and *My Test/Exam Information* links on the student portal (cf. Tables 6.3.4.2.c and Table 6.3.4.e).

The results clearly indicate that while undergraduate and post-graduate students do have a common need for certain information on the MyMaties student portal, there are areas where their study level requires differentiated information provision. It is suggested that postgraduate students would by nature of their research-based studies use the library extensively and use and value the *My Library* link on the portal. Postgraduate students, in contrast to undergraduates, are generally evaluated by means of a thesis or dissertation and would therefore value the *Submission of Theses/Dissertation* link more than the undergraduate students.

Undergraduate students' greater need for access to the *Class Group Allocation* and *My Test/Exam Information* links could be attributed to the fact that they are more bound to scheduled class attendance than postgraduate students and they are more frequently evaluated by means of tests and exams. Postgraduate students, as mentioned above, are evaluated on the basis of dissertations or theses submitted.

7.2.2.5 Positive and negative views with regard to the student portal

It clearly emerged from the comments provided that students were generally satisfied with the information that is provided and many of the more technical features of the student portal. The following is a summary of the positive attributes they highlighted:

- information that is provided is important and relevant to their studies,
- good summarisation is generally provided of all important information and relevant links are provided,
- the portal is user friendly and provides easy access to information (this corroborates with the positive outcomes outlined in 7.2.2.3 above,
- convenient access provided to their email and learning management system, i.e. Webmail and WebCT, and
- comments relating to the layout and design were mostly positive, e.g. it is considered to be uncomplicated and links are easy to use.

However, many students also expressed concern about many portal features, both informational and technical, that were not meeting near needs, e.g.:

- information was not always up to date,
- important information was often omitted from the portal, this could explain the slightly lower rate for this category outlined in (cf. Table 6.3.3.h),
- certain functions of the portal could be improved, e.g. overall layout, responsiveness and usability of the portal,
- technical problems mostly related to aspects such as instability, slowness and lack of access to the My Storage space (These comments mostly came from students at satellite campuses or who had problems with their off campus access and support),
- various respondents considered the advertisements inconvenient,
- many students thought that the user-interface design is cluttered and inadequate, and
- many students were concerned about the number of links they had to follow to navigate their way to the information they required – this impeded information searching (these comments highlight the need to improve the design and layout of information on any portal to ensure good navigation).

7.2.2.6 Changes or comments with regard to the university's main website or portals

This last series of questions asked the students to provide feedback on any changes or features they would like made on the university website or student portal.

A number of students suggested that the University should consider redesigning the total structure of the portal and particularly introduce the option to allow users to personalise links. In addition, students suggested a scaling down of advertisements and suggested a reduction of links and sub-links.

It further emerged that the students would like the University to address the instability of the portal, especially with regard to satellite or off-campus access. Notwithstanding, these comments it is clear that a number of students considered the portal easy to use and commended the portal's functionality and the University's website developers for the effective dissemination of information on the portal.

7.2.3 Interviews

This section is based on the responses obtained during the interviews that were held with three key stakeholders who are actively involved with the design, development and maintenance of the university's website and portal (cf. 6.4). It outlines the major perceptions that the stakeholders have relating to the current portal, content management system implementation requirements and potential problems which could impede the implementation process

7.2.3.1 Current portals' value and the need for a content management system

All three stakeholders agreed that the various portals at the University have a very important role to fulfil to provide access to important information that relates to both the academic and administrative needs of students and staff alike. They were, however, also very aware of the many problems pertaining to the systems, e.g.:

- the existing portals are outdated (been in place for the last eight years) and were no longer meeting current expectations, and
- they do not always integrate efficiently with other information systems at the university.

The interviewees further made a number of suggestions that could improve the situation and specifically referred to the benefits that could be derived from the enhanced functionalities and characteristics that new content management systems can offer. For example, such an updated content management system could address the current lack of control of the content life cycle by means of enhanced functionalities such as version control and workflow management. This could all result in the elimination of duplication and the more efficient management of information.

In the following sections a brief overview is provided of the more specific factors that the stakeholders would like to see addressed when a new content management system is implemented at Stellenbosch University.

7.2.3.2 Layout and design

Interviewees emphasised the importance to create information models, specific policies and procedures to specify and guide the design and layout of content on the content management system. All three interviewees highlighted problems with the current portal design with regard to its search feature and the layout of links and the navigation panes that are (in their view) ineffective and cluttered. These opinions clearly corroborate the views articulated by staff and students (cf. 7.3.5 - 7.3.6).

7.2.3.3 Information that 'should' or 'should not' be published to the staff and student portal

The stakeholders acknowledged that the choice of what information should be published to the portal was a complex undertaking (cf. also the content management process frameworks in Chapter 3). This complexity is widely recognised and several authorities in the field thus propose the conduct of a full content analysis (i.e. content audit) followed by information modelling to help resolve this problem (Boiko, 2005; Rockley et al., 2003). The University is, however, trying to address these issues by seeking the expertise of a knowledgeable person to manage the content, metadata and overall information architecture of the new system. It was further suggested that the only solution to the problem would be if the University was to completely redesign the information architecture before migrating existing information to a new content management system and that faculties and administrative departments revisit and re-evaluate each link in an endeavour to create user-centric content.

7.2.3.4 New features or functionalities with regard to the new content management system

Interviewees offered a number of suggestions regarding new features and functionalities for the new content management system. These include the following:

- The implementation of a content management system should be spread out over time as a phased-approach. A web-based content management system should be considered for the first part of the implementation.
- The University should embrace a holistic approach which incorporates prevailing advances in mobile technology and user expectations for newer, easy-to-use forms of delivery and publishing.

- The University should commence with its content management system with care as certain new functionalities may not address the expectations the University might have with regard to the managing and dissemination of specific content types. Stewart et al. (2008) concur with such an approach and highlight the complexity of efficiently managing and defining content types within higher education organisations. These challenges are often not taken into account by content management systems suppliers. It should further be recognised that content can include library material and its metadata, website content, learning management system content, administrative processes content, records, transactions and data sets in a range of formats.

7.2.3.5 Problems that could impede the successful implementation of a content management system

Interviewees emphasised that the success of a content management system depends to a very large extent on buy-in from top management (cf. also Boiko's (2005) recommendation to 'get a mandate') and adequate resources (from the necessary funding to human resources with the necessary skills and knowledge). A further problem could arise if a new content management system is not well integrated with other systems on Campus.

A final problem that was voiced was the varying viewpoints within the University with regard to the overall value of a content management system. As a result, it could be difficult for the content management team to demonstrate the potential benefits of the system to all stakeholders (e.g. authors, editors) or to communicate the value of the system to end-users.

7.2.3.6 Preferred publication deployment platform

The interviewees stated emphatically that before the University could select the correct publication deployment platform for its content management system it should develop a clear plan for the effective management and dissemination of content. This should include an approved policy or strategy to address the management of the entire content life cycle. It was specifically stated that one of the foremost prerequisites for any publication deployment platform would be ease of use, particularly from an authoring perspective. Trainers should be designated to guide authors within departments, specifically those who author web content at irregular intervals.

7.2.3.7 Authoring

It is clear that the creation of information is a highly decentralised at the University. This could result in content authors not being aware of related authoring initiatives elsewhere on Campus,

duplication of content may occur and thus complicate the management of the content life cycle. It was further clear that, at the time of the interviews, the University did not have a content authoring or reviewing policy¹⁸ in place. However, one of the interviewees mentioned that the University's Web team did moderate incoming information and most Departments followed the corporate guidelines for publishing information to the website or portals. It was thus evident from the interviews that the University was cognizant of the need to develop policies to manage content in various formats as well as their function within the university system (i.e. records, transactions, learning information).

7.2.3.8 Information technology

It clearly emerged that the information technology group has a vast range of responsibilities, viz.:

- On the one hand they have to solicit support from management for the enhancement and promotion of new technologies on Campus.
- On the other hand they have to support existing technologies that have often outlived their role on Campus and which are often difficult to maintain or migrate to new information management systems.

One stakeholder, furthermore, mentioned that departments or faculties sporadically approach external vendors to purchase new technologies without alerting the information technology group in advance. As a result, the group is often called upon to provide support to new products that are incompatible with other technologies on Campus. The University has consequently instituted a Technical Committee to assist with the selecting and purchasing of new technologies to ensure support and appropriate infrastructure upon which the systems will run. Comments that related more specifically to information technology and the implementation of a content management system emphasised the need to get staff and other stakeholders involved in new technologies and the role of the information technology staff have in marketing and explaining the potential benefits of new technologies.

The following provides a summary of the key points raised relating to information technology aspects:

- the need for the new content management system to integrate with other systems on campus,

¹⁸ At the time of the interviews the University was contemplating the development of standards/policies to regulate certain content types with regard to the management of the full content lifecycles from their creation to destruction.

- the need to embrace the newer technologies such as social media and other mobile technologies,
- the need to assimilate both digital and printed publishing methods, and
- the need to migrate or redesign current technologies to fit the modules of a content management system, e.g. the management of web content, records management and learning management environments.

7.2.3.9 Users of the portals

The interviewees identified students as the largest group of users of the portals at the University. It further clearly emerged that the students, as users of advanced technologies such as mobile computing, often expect information to be available through these media and this would require the University to investigate new ways of disseminating information.

This however did not mean that the academic/research and administrative/services staff were not important users of the portals. A significant aspect that the interviewees accentuated is the need for additional management information to be published to the staff portal to facilitate access to business-related as well as other information that could support senior management with decision-making processes.

7.3 Recommendations

This study investigated the perceptions that users had with regard to the efficacy of the Stellenbosch University portals. The objective of this study was to examine the views of the users of the Stellenbosch University's portals and website to gain an understanding of their requirements prior to the implementation of a content management system. This development must be seen against the background of the exponential growth of information and its utilisation within the higher education context. A key feature of this context involves the cost-effective utilisation of information technologies, more specifically content management systems, for the managing of different content types within the higher education landscape.

Content management systems consist of multifaceted information management components and the key to creating a strategy for the successful implementation of a content management system is to gain a clear understanding of technologies that are already in place (Hackos, 2001). Moreover, a content management strategy can be implemented in various ways as organisations have different goals and functions. Thus, the aim of any set of recommendations for a content management strategy is not only to provide an all-inclusive strategy with regard to content management system implementation, but also to make suggestions in order to facilitate the

implementation of a more focused content management system. Such a system should thus on the one hand be guided by the information needs/requirements of the different users, e.g. in a university environment this would consist of administrative/services staff, academic/research staff and students, and on the other hand, the core business of the organisation¹⁹.

The proposed recommendations are based on information obtained during the investigation regarding the portal needs of various users at Stellenbosch University. In the previous section, the researcher summarised the findings of the study with reference to the views of users of the current portals and corporate website. Stakeholders were also interviewed with regard to their views on the current portals as well new content management system requirements.

The following sections thus provide a thematic outline of the various recommendations the University could focus on for the implementation of a content management system.

7.3.1 Management involvement

The need to gain support from top management with regard to content management system implementation is one of the common challenges outlined in the literature. This aspect of management 'buy-in' also clearly emerged during the interviews with stakeholders. It is therefore advisable that, to ensure management involvement, the content management implementation team develop a clear proposal or business plan, indicating how a content management system could support/enhance the management of various content types. It should be emphasised to management that a proper functioning CMS will provide effective advice and solutions to the underlying challenges of different content types, for example, information related to teaching and learning, legal processes, and various transactional and regulatory requirements.

7.3.2 Employee involvement

Rockley et al. (2003) underscore the fact that employee resistance could play a significant role in jeopardising the implementation of any new procedure or system in any organisation. A vital factor to ensure the successful implementation of a content management system would thus be clear communication and participation of all stakeholders and users. This requires a well-developed strategy to facilitate the migration towards a new platform for content management. Such a strategy should consider the impact that a new content management system would have on various operational issues (human resources, 'how knowledgeable the users are with regard to the various portals', capacity to interact with other systems on Campus, budgetary

¹⁹The core business and focus of higher education institutions consist of teaching and learning, and research, whilst the importance with regard to community involvement in the South African context is also recognised.

constraints, etc.) during the implementation of the system. It is therefore necessary that a Committee, with a broader focus than the Portal Committee, be established to manage the implementation of a content management system²⁰.

In view of the central role of such a content management system to the functioning of the organisation, it is suggested that this committee be established as a Committee under the auspices of Senate, bearing in mind the fact that teaching and learning as well as research form the core business of the organisation. Given the complexity and dynamics of the implementation of a content management system, it is further suggested that individuals with an interest in the development or use of content management on campus be selected to form part of such a committee, and also to function as “change agents” (p. 404) that could clearly communicate verified and consistent information to various sectors within the University community.

The researcher, in line with Brys’ (2004) recommendations, further proposes that responsibilities for various tasks be assigned to specific task groups, e.g. providing content, updating of content, and web publishing responsibilities. Such clarification of ownership would clearly demarcate responsibilities and assist with successful CMS implementation. Another important factor emphasised by Brys (2004, p. 5) and endorsed by this researcher is that staff should receive training on the key aspects of “writing for the web”, “the need for diversity in web publishing”, design and use of style sheets and templates, as well as the use of obligatory University writing and branding procedures.

It is further proposed that to ensure ‘buy in’ from all user types, provision should be made for ‘user-involvement’ with regard to the design and testing of the content management system.

7.3.3 Information architecture

Information architecture is concerned with the overall organisation of information on websites and, according to Rockley et al. (2003), this includes information products, metadata, reuse strategies as well as the overall architectural design that provides user-friendly information. They further state that by creating a well designed website access to information and the appropriate use thereof can be enhanced.

It clearly emerged from the feedback that the interviewees and questionnaire respondents provided that they considered the campus portals to be cluttered. They found it particularly

²⁰A cross-institutional committee, namely the Web Committee was created in May 2011 in terms of the Information Technology Governance Structure. It replaces the old Portal Committee (Stellenbosch University, 2011).

difficult to search for the specific information they need on the various campus portals. It is therefore proposed that the University should seriously consider incorporating an effective information architecture as an essential component of the design and modelling of content elements.

It is further suggested by Stewart et al. (2008) that an appropriate taxonomy should be developed to describe various content elements and thus improve the classification of information as well as subsequent searching and retrieval of information. The organisation of information and access to relevant information with clearly articulated links can facilitate the integration of information (content) and the transfer/sharing of knowledge across the institution. Likewise, one of the interviewees articulated the need for the University to create a file plan for the efficient management of documents and records at the University.

It is thus recommended that the University obtain the expertise of an information architect or metator^{21,22} to ensure that the content management system's content structures as well as metadata are functional and that they address the needs and requirements of stakeholders and users.

7.3.4 Web content audit

Content is one of the fundamental components of any organisation. For instance, within the higher education environment, the amount of teaching and learning content continually grows as new courses are constantly added to the curriculum or old course content is updated. Obtaining an understanding of the nature and structure of content within an organisation is thus an essential prerequisite that would facilitate the successful implementation of a contents management system.

It is therefore recommended that the University conduct an in-depth content analysis (cf. Rockley et al., 2003). An in-depth content analysis entails, amongst others, a detailed examination of content and usually follows a top-level analysis. The detailed examination of content would involve the scanning of various information products to establish an appropriate taxonomy, identify duplicate or distinct information that should be removed or merged, and to clearly map what content should or should not be migrated to the new content management system. Although the University could decide to focus on any one area, e.g. the post-graduate

²¹The role of an information architect can be expanded to include the function of a metator. Boiko (2005) describes metators as the editors of metadata, who tag segments of information with appropriate metadata to facilitate the dissemination of information.

²² At the time of the study one of the interviewees indicated that the University was in the process of appointing a metator to look into the overall architecture and metadata of the proposed content management system.

portal, as pilot for the implementation of a content management system, it is recommended that the University enlarge the scope of the audit to identify the requirements with regard to various content types, as lack of insight into the nature of different content types could impact future implementation processes or result in poor technological choices (cf. Rockley, et al. 2003).

7.3.5 Managing various content types

The majority of higher education organisations have to manage a variety of types of content. Content management systems were therefore developed to assist organisations in managing content pertaining to all facets of the organisation and with regard to different types of content, e.g. records management, publication deployment management, and digital asset management (Rockley et al., 2003). A report by the Association for Information and Image Management (AIIM, 2011a, p. 23) underscores the importance of investigating all content types to determine the current degree of management of content and to relate this to possible wasted time in re-inventing already existing content.

It clearly emerged from the interviews that the University currently deals with heterogeneous and often incompatible content types throughout its various information management applications. For this reason, it is suggested that the University's content management team solicit representatives from all departments and divisions involved in records management, digital asset management, e-Communication (i.e. emails) and other forms of content management to co-ordinate, develop and upgrade content management systems. Their brief should address the development of appropriate campus-specific strategies, e.g. an organisation-wide taxonomy, security challenges, improved processes such as workflow processes, retention schedules and legal compliance with regard to specific content.

The University should further also investigate other deployment platforms, such as those provided by means of 'cloud' computing²³, to facilitate storage and to make it easier to synchronize data. Such innovations would allow users to access to enterprise content from iPads, iPhones and other mobile devices.

In conclusion, by developing a content management solution that is utilised to its full capacity, the University could address various academic, business decision-making, and administrative content needs within the University.

²³ Gartner (2008, p. 1) defines cloud computing as "a style of computing where massively scalable IT-enabled capabilities are delivered 'as a service' to external customers using Internet technologies."

7.3.6 Authoring and editing

An important factor which affects content management implementation is the technical ability of authors to write content with a content management solution in mind. Content authors do not necessarily have the skill required to write content for content management solutions (Brys, 2004). It is thus recommended that authors be trained to understand the significance and changing role required to write content that is appropriate for use in content management systems. The purpose of content management authoring, is to write in such a way that content chunks can be extracted to address specific user requirements. This entails that content chunks are created in such a way that they can be reused wherever they are required, e.g. on the Web or a printed faculty handbook.

A further important factor that emerged from the interviews was that various departments within the University are often not aware of authoring initiatives in other departments - this could lead to the reduction of duplication of information across Campus. It is thus recommended that everyone involved in creating content for the University should collaborate and develop strategies that would address how content chunks should be authored. This would ensure quality in the creation and better reuse and distribution of content. Rockley et al. (2003, p. 365) refer to this type of collaborative writing as “breaking down the silos”. To overcome such problems, it is therefore recommended that component content management modules be utilised to manage content on a granular level, which could be advantageous to the University as less content needs to be created since content is the same wherever it is reused. Thus the University’s content editors and information technology department could investigate ways in which they can collaborate to manage content at granular level, in order to facilitate the publishing of reusable content to various formats, e.g. printed handbooks, Web publishing, etc.

The role of content editor is a vital function and ensures that the University’s web content, as well as other content types, adheres to high-quality standards, utilises a good writing style, effectively reuses content, and maintains the integrity of the content. It is therefore recommended that the University ensures that their web editors or web managers understand the functioning and impact of content within various content management systems and that they effectively manage content within this highly structured environment.

7.3.7 User focused content

According to Rockley et al. (2003, p. 204) “the amount of information users have to search through to find the information they need is often overwhelming.” It is therefore a key feature of an effective content management system to address users’ specific needs.

The study has clearly indicated that each component of the university constituency, viz. academic/research staff and administrative/services staff as well as undergraduate and post-graduate students, has distinctive portal information needs. In order to deliver the right type of content to users it is recommended that the University create different 'personas'²⁴ of the various user categories. In support of this proposal, the following tenets, based on the findings of this study, should guide the University in providing user-centric content:

- provision of separate web content for undergraduate and post-graduate students,
- provision of separate web content for academic/research and the administrative/services staff,
- enhanced mobile content delivery to address the expressed media preferences of undergraduate students,
- increased use of social networking technology to address the expressed preferences of undergraduate students,
- to invest in a good quality search feature for the University's various websites,
- publishing a campus-wide calendar to synchronise and distribute important events on Campus, and
- creating a clear link on the staff web portal to guide users to the policies and procedures that apply to them.

7.3.8 Information technology

Information technology plays an important role in the selection, management and deployment of content management system technologies within any organisation. It is thus imperative that the University's information technology team should have a clear understanding of the various functionalities of the selected content management solution. They should further ensure that the content management system complies with recognised Web standards and it has the capacity to integrate with existing technologies, e.g. those employed for student records, as well as anticipated technologies, e.g. mobile-based technologies and cloud computing.

As mentioned in the recommendations with regard to authors, writing of content for a content management system is a specialised field and should address specific content needs (cf.7.3.6). Style sheets, authoring templates²⁵, metadata and workflow processes should be created by the information technology team to facilitate the authoring of user-specific content to a content

²⁴A persona is a profile of a typical user for a particular user category, in order to assist with the design of user-centric software (Rockley et al., p. 209).

²⁵ Style sheets and authoring templates are typically created in XML authoring language.

repository²⁶. According to Rockley et al. (2003), the use of XML-native language content management system could speed up access to information and eradicate connectivity problems. It is thus recommended that staff with knowledge of XML authoring languages be deployed or recruited by the University to ensure effective content management.

7.3.9 Summarising remarks

In conclusion, the recommendations mainly focused on processes that could be adopted by the University to develop a content management system that would enhance portal and website interaction and satisfy users' information and stakeholders' requirements. It is, furthermore, essential that the Stellenbosch University establishes a content management strategy that is developed in a coherent way and which is adopted prior to the implementation of a content management system. Such a strategy would ensure that the content management system follows a user-centered approach and address the dissemination of information needs of its target audiences. It is further suggested that given the complex nature of the process and the fact that various sectors within the university community would be involved, that the University implements its content management system in a modular manner.

7.4 Future research

The focus of this study was geared towards a needs analysis²⁷, as a preliminary phase of a content management implementation framework. It is further suggested that an in-depth content audit be conducted with regard to the campus portals and website(s) and to determine what content should or should not be included within the to-be-established content management system. It is proposed that this investigation could be of benefit to other institutions in developing a model for best practices with regard to the implementation of content management systems at tertiary institutions.

7.5 Concluding remarks

The objective of this study was to examine the views of the users of the Stellenbosch University's portals and website to gain an understanding of their requirements prior to the implementation of a content management system. The further objective was to provide

²⁶ A content management system's repository manages the content and metadata associated with each content chunk, by means of a relational database (Rockley et al., 2003, p. 132).

²⁷ It clearly emerged from the literature-review that a needs-analysis should be conducted prior to the development of a contents management strategy in order to guide the implementation of a contents management system.

recommendations that could be used by the University in developing a content management strategy that would direct the implementation of a content management system.

To meet these objectives, the researcher was guided by a set of research questions derived from the overall objectives identified and knowledge gained after a conducting a review of the literature pertaining to content management systems, solutions and implementation processes. These questions related to the following aspects (cf. 1.4):

Main research question

How can the Stellenbosch University address the website and portal information needs of its users through the implementation of a content management system?

Secondary questions

What are the content needs of the various segments of users of the Stellenbosch University?

What strategies or policies should be in place for the effective implementation of a content management system?

What contribution does this study make to the tertiary education environment in general?

These research questions are addressed by providing the following brief outline of the various factors that emerged from the study:

- Users were in general satisfied with the information currently available on the various portals and websites.
- The feedback however showed that various groups of users had specific information needs and that content should be targeted to 'different users in different ways'.
- Staff and student respondents experienced various technical issues with the current web portals' integration with other systems on Campus. The University should therefore strongly focus on ways to enhance the ability of the content management system to collaborate and integrate with other systems on Campus.
- There was a lack of consistency in the design of the portals and the importance of adopting effective information architecture was identified. This would ensure that the proposed content management system is user-centric.

To conclude, in recognition of the complex nature of content management systems, it is suggested that it is not feasible to develop a single all-inclusive content management system. A far better approach would be to adopt a phased or modular implementation strategy for the

envisaged content management system. This approach has the advantage of providing the University with the opportunity to build on the successes of the different sectors at each stage of the implementation process. In a similar way the implementation team could learn from the failures as each content management component is being added, and consequently modify the implementation plan during the process.

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APPENDICES

Appendix A: Letter to request permission to conduct study

APPENDIX A: Letter to request permission to conduct study



**Department of Information and Library Studies
Centre for Information Literacy**

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27 May 2010

Ms Benette Kriel
Manager for IT User Support
University of Stellenbosch

Dear Ms Kriel

MPhil research: Ms Dianne Steele: Academic Portals: the planning and implementation of a comprehensive content management strategy at the University of Stellenbosch

I herewith wish to request your support for the intended research project of our MPhil student, Ms Dianne Steele. As previously discussed with you, she would like investigate how effectively the University of Stellenbosch is addressing the needs of its community with regard to its academic portal and the application of MOSS (Microsoft's Office SharePoint Server 2007) for that purpose.

The study more specifically intends to:

- Investigate what the University of Stellenbosch expects from its proposed campus portal and how to best address the information needs of its users.
- Suggest various interventions that could assist the University to better deploy its content management strategy and
- Further enhance the University's web presence within its community.

Ms Steele will at all times adhere to the research, ethical and confidentiality requirements imposed by the University of Stellenbosch.

We would be most appreciative of your support as we see this as not only as an opportunity to address the needs of the users of your portal and improve its efficacy, but also provide the opportunity for co-operation between our two universities.

Yours sincerely

Dr J G SMITH
MPhil Supervisor

Appendix B: Ethical clearance



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29 November 2010

TO WHOM IT MAY CONCERN

MPhil research: Ms Dianne Steele: Academic Portals: the planning and implementation of a comprehensive content management strategy at the University of Stellenbosch

With regard to Ms Steele's research project:

This serves to state that our Departmental Committee has met and that we are satisfied with Ms Steele's declaration that the abovementioned research project will not infringe on any ethical policies of this University. The project will adhere to all requirements outlined by the University of Cape Town's Humanities Faculty.

Dr J G SMITH
MPhil Supervisor

Appendix C: Stellenbosch University institutional permission to conduct study



Appendix D: Consent form

STELLENBOSCHUNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH

AN EXPLORATORY CASE STUDY INTO THE DEVELOPMENT OF A CONTENT MANAGEMENT STRATEGY FOR THE UNIVERSITY OF STELLENBOSCH

You are asked to participate in a research study conducted by, Dianne Steele (M-Phil Student), from the Centre For Information Literacy, Department of Library and Information Studies, University of Cape Town, currently conducting research at Stellenbosch University. The results of this study will help the researcher to get a better understanding of the University of Stellenbosch community's information needs as it applies to the use of portals and websites. The results of a web-based survey, as well as personal interviews, will be reflected in a final dissertation. You were selected as a possible participant in this study because of your affiliation with the Division for Information Technology of the University.

1. PURPOSE OF THE STUDY

The purpose of the study is to conduct an in-depth study into the implementation of a content management system at the University of Stellenbosch and how such a web presence can equip users with the information they need to carry out their activities or to make decisions.

2. PROCEDURES

If you volunteer to participate in this study, we would ask you to answer questions in the following categories:

Personal information (e.g. job title), Your interaction with the University's staff and student portals, Your vision of the University's content management system, Your vision of your users' experiences with the portals.

3. POTENTIAL RISKS AND DISCOMFORTS

Participation in this study will not disadvantage the participant in any way.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Content management systems can improve website and portal interaction and thus the working environment of both staff and students at academic institutions.

5. PAYMENT FOR PARTICIPATION

Participation will not receive payment from the researcher, but the working environment could improve as a result of the implementation of a content management system. (See 4 above)

6. CONFIDENTIALITY

Any information that is obtained in connection with this study, that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of limited access to the results. Ms. Steele (Researcher), Dr. G. J. Smith (Supervisor to the study, University of Cape Town) and Ms. B. Kriel (Division Information Technology, University of Stellenbosch) will have access to the results. Information will be stored on Ms Excel and/or SPSS and passwords will be assigned to files. Personal information, if in breach of confidentiality, will not be linked to specific participants and no names or contact details will be used in the dissertation.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact Ms. Dianne Steele at (021) 650-5953 (work) or Dianne.Steele@uct.ac.za (e-mail).

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms M. Fouché (mfouche@sun.ac.za; tel. 021 808 4622) at the Division for Research Development.

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE
--

The information above was described to me by Dianne Steele in Afrikaans and English and I am in command of these languages or it was satisfactorily translated to me. I was given the opportunity to ask questions and these questions were answered to my satisfaction.

I hereby consent voluntarily to participate in this study. I have been given a copy of this form.

Name of Subject/Participant

Name of Legal Representative (if applicable)

Signature of Subject/Participant or Legal Representative

Date

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____. She encouraged and given ample time to ask me any questions. This conversation was conducted in Afrikaans/English and no translator was used.

Signature of Investigator

Date

Appendix E: Interview schedule (Afrikaans)

Universiteit Stellenbosch – Onderhoudskedule²⁸

2011

1. *Persoonlike inligting*

1.1 Wat is u werkstitel?

1.2 Hoe is u betrokke by die Universiteit Stellenbosch se portale?

2. *U interaksie met die Universiteit se personeel en studente portale*

2.1 Voldoen die huidige personeel en studente portale aan u verwagtinge? Hoekom?

2.2 In terme van uitleg en ontwerp, waarvan hou u die meeste van die Universiteit se personeel en studente portale?

2.3 In terme van uitleg en ontwerp, waarvan hou u die minste van die Universiteit se personeel en studente portale?

2.4 Watter inligting, tans beskikbaar, moet nie gepubliseer word op die Universiteit se personeel en studente portale?

2.5 Watter inligting, nie tans beskikbaar nie, wil u graag gepubliseer sien op die personeel/studente portaal?

3. *U visie van die Universiteit se inhoudsbestuurstelsel*

3.1 Wat is u siening van hoekom die Universiteit Stellenbosch 'n inhoudsbestuurstelsel nodig het?

3.2 Watter kenmerke sal u graag beskikbaar wil hê in 'n inhoudsbestuurstelsel?

3.3 Watter probleme voorsien u wat die suksesvolle implementering van 'n inhoudsbestuurstelsel kan verhinder?

3.4 Watter voorkeure of vereistes het u ten opsigte van 'n publikasievystellingsplatform?

3.5 *Outeurs*

3.5.1 Hoe word inhoud tans deur u geskep?

3.5.2 Saam met wiewerk u wanneerinhoudgeskep word?

3.5.3 Weet u gewoonlik van soortgelyke inisiatiewe by die universiteit, en indien wel, hoe affekteer dit die inhoud waaraan u werk?

3.5.4 Hoe word dokumente geskep?

3.5.5 Wat doen u om dokumente te beheer?

²⁸Onderhoudskeduleaangepas nagevang van inligtingontvangd.m.v. persoonlikekommunikasie met Me. S. Steele (Monash Universiteit) en Mnr. M. Smuts (Tilburg Universiteit) asook 'n indieptestudie en daaropvolgendeaanpassing van verskeieinligtingsbestuurspublikasies se aanbevelings, bv. Boiko (2005) en Rockley et al. (2003, p. 86).

- 3.5.6 Het u standarde vir outeurs om inhoud te kan skep?
- 3.5.7 Watter probleme ondervind u om inhoud te kan skep?

3.6 *Hersieners*

- 3.6.1 Wat is die huidige hersienproses van inhoud?
- 3.6.2 Aan watter standarde behoort die inhoud te voldoen?
- 3.6.3 Hoe kommunikeer u vereistes aan outeurs?
- 3.6.4 Watter verbeteringe kan u aanbeveel vir hierdie proses?

3.7 *Inligtingstechnologie*

- 3.7.1 Wat is die proses vir die implementering van nuwe tegnologie op Kampus?
- 3.7.2 Met watter huidige tegnologie sal die inhoudsbestuurstelsel moet kan integreer?
- 3.7.3 Watsien u as moontlike probleme wat u mag ondervind om IT ondersteuning te verskaf vir die proses?
- 3.7.4 Is daar enige spesifieke nuwe vereistes wat in aggeneem moet word met die implementering van 'n nuwe inhoudsbestuurstelsel?
- 3.7.5 Is u bewus van enige ondersteunende tegnologie wat kan indruis teen die implementering van 'n inhoudsbestuurstelsel op kampus?
- 3.7.6 Voorsien u enige ander probleem wat kan indruis teen die implementering van 'n inhoudsbestuurstelsel?

4. *U visie van u gebruikers se ervaringe met die portale*

- 4.1 Wie is die grootste gebruikers van u portale?
- 4.2 Watter probleme het gebruikers al gerapporteer in verband met die portale?
- 4.3 Is daar enige areas van die portale wat u voel nie aan die verwagtinge van u gebruikers voldoen nie?

Appendix F: Interview schedule (English)

Stellenbosch University – Interview Schedule²⁹

2011

1. *Personal information*

1.1 What is your job title?

1.2 How are you involved with the Stellenbosch University's portals?

2. *Your interaction with the University's staff and student portals*

2.1 Are the current staff and student portals meeting your expectations? Why?

2.2 In terms of layout and design, what do you like most about the University's staff and student portals?

2.3 In terms of layout and design, what do you like least about the University's staff and student portals?

2.4 What information, currently available, should not be published on the University's staff and student portals?

2.5 What information, not currently available, would you like to see published on the University's staff and student portals?

3. *Your vision of the University's content management system*

3.1 What are your views on why the Stellenbosch University needs a content management system?

3.2 What features would you like to see available in a content management system?

3.3 What problems do you foresee that could impede the successful implementation of a content management system?

3.4 What preferences or requirements do you have for a publication deployment platform?

3.5 *Authors*

3.5.1 How do you currently create content?

3.5.2 Who do you work with when you create content?

3.5.3 Do you usually know about other initiatives at the University and, if so, how do they affect the content that you are working on?

3.5.4 How are documents created?

3.5.5 What do you do to control documents?

3.5.6 What written standards do you have for authors to prepare content?

²⁹ Interview schedule adapted from information gained through personal communication with Ms. S. Steele (Monash University) and Mr. M. Smuts (Tilburg University), as well as in-depth study and adaptations of various content management publications' recommendations, such as Boiko (2005) and Rockley et al. (2003, p. 86).

3.5.7 What problems do you face in translating content?

3.6 *Reviewers*

3.6.1 What is the current review process of content?

3.6.2 What standards are the content expected to meet?

3.6.3 How do you communicate requirements to authors?

3.6.4 What improvements can you recommend for this process?

3.7 *Information Technology*

3.7.1 What is the process for adopting new technology on Campus?

3.7.2 With what existing technology will the content management system have to integrate?

3.7.3 What do you see as possible problems you might face in providing IT support for this process?

3.7.4 Are there specific new requirements that need to be taken into consideration with the implementation of a content management system?

3.7.5 Do you know of any non-standard or unsupportive technology that could impede the implementation of a content management system on Campus?

3.7.6 What other issues do you anticipate that could impede the implementation of a content management system?

4. *Your vision of the users' experiences with the portals*

4.1 Who are the biggest users of the portals?

4.2 What problems have users reported about any of the portals?

4.3 Are there any areas of the portals that you feel are not meeting your users' expectations?

Appendix G: Staff questionnaire (Afrikaans)

Universiteit Stellenbosch – Webwerfopname

Februarie 2011

Geagte Personeellid,

Ek is tans besig met navorsing ten opsigte van die implementering van 'n inhoudsbestuurstelsel vir die Universiteit Stellenbosch.

Deur u deelname in die opname, hoop ek om 'n beter begrip van die universiteitsgemeenskap se inligtingsbehoefte, soos dit van toepassing is op die gebruik van die Universiteit Stellenbosch se portale en webwerwe te kry. Die Afdeling Informasietegnologie van die Universiteit onderskryf hierdie studie.

U deelname aan hierdie studie is vrywillig en anoniem. Die vraelys sal slegs 10 tot 15 minute van u tyd neem om te voltooi.

Kontak my asseblief deur middel van e-pos by D.Steele@uct.ac.za indien u enige vrae het oor die vraelys.

Ek hoop u sal ons help deur hierdie vraelys te voltooi.

Die Uwe,
Dianne Steele

1. Persoonlike inligting

Antwoord asseblief 'n paar vrae oor uself.

1.1 Geslag (kies asseblief)

Manlik Vroulik

1.2 Onder watter van die volgende ouderdomskategorieë val u?

30 of jonger 31 - 40 41 - 50 51- 60 61 of ouer

1.3 Watter van die volgende werknemerskategorieë beskryf u affiliasie met die Universiteit Stellenbosch die beste?

Akademiese/navorsingspersoneel

Senior Bestuur Dekaan van 'n Fakulteit Departementshoof
 Professor Medeprofessor Senior Dosent
 Dosent Junior Dosent Senior Navorsers
 Navorsers Junior Navorsers

Ander (noem asseblief): _____

Administrasie & Dienste

Junior Personeel Middel Bestuur Senior Bestuur

Ander (noem asseblief): _____

1.4 Watter Fakulteit of Administrasie/Dienste beskryf u betrokkenheid met die Universiteit die beste?

Fakulteit

-- Kies asseblief een --

AgriWetenskappe

Ekonomiese en Bestuurswetenskappe

Gesondheidswetenskappe

Krygskunde

Ingenieurswese

Lettere en Sosiale Wetenskappe

Natuurwetenskappe

Opvoedkunde

Regsgeleerdheid

Teologie

of

Administrasie/Dienste

-- Kies asseblief een –

Akademiese Administrasie

Akademiese Steun

Argief

Beurse

Biblioteek

Fasiliteitsbestuur

Finansies

Gemeenskapsinteraksie (Afdeling vir)

Informasietegnologie

InnovUS (Intellektuele Eiendom)

Institusionele Navorsing en Beplanning

Interaktiewe Telematiese Dienste

Internasionale Kantoor

Kommersiële Dienste

Kommunikasie- en Skakeling

Konservatorium

Kunsgalery (en museum)

Menslike Hulpbronne

Museum

Navorsingsontwikkeling

Ombudsman

Ontwikkeling & Alumni-verhoudings

Regsdiens

Sentrale Meganiese Dienste

Sentrum vir Studentevooriging en -ontwikkeling

Sentrum vir Voornemende Studente

Sport Prestasie Instituut (SUSPI)

Studentesake

2. U interaksie met die Universiteit Stellenbosch se webwerf (<http://www.sun.ac.za>)

2.1 Hoe gereeld maak u gebruik van die Universiteit se webwerf by <http://www.sun.ac.za>?

(Moet asseblief nie die gebruik van die personeelportaal My.sun.ac.za insluit nie.)

--Kies asseblief een—

Aanhoudend deur die dag

Een keer per dag

'n Paar keer gedurende die week

'n Paar keer gedurende die maand

Een keer 'n maand of minder

Nooit

2.2 Hoe tevrede is u met dié webwerf?

-- Kies asseblief een --

Heeltemal tevrede

Meestal tevrede

Nie tevrede of ontevrede nie

Meestal ontevrede

Heeltemal ontevrede

Nie van toepassing nie of geen opinie nie

3. U interaksie met die Universiteit se personeelportaal

3.1 Hoe gereeld maak u gebruik van die Universiteit Stellenbosch personeelportaal (My.sun.ac.za)?

-- Kies asseblief een --

Aanhoudend deur die dag

Een keer per dag

Twee tot drie keer per week

Twee tot drie keer 'n maand

Een keer 'n maand of minder

Nooit

3.2 Tot watter mate voel u is dit belangrik om toegang tot die volgende skakels te hê?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

Onderrig en Leer	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Navorsing	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Gemeenskapsinteraksie	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
VirBestuur	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.1 Tot watter mate beskou u dit belangrik om toegang tot die volgende aftrekkoppels vanaf die *Onderrig en Leer* etiket op die portaaltuisblad te hê?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

Bestuur Modules	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Bestuur Kurrikulum	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Bestuur Studente	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Webstudies	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Eerstejaarsakademie-moniteringstelsel	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Eksamen/Toetsinligting	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Roosters	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Akademiese Steun	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Sentrum vir Onderrig en Leer	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Universiteit Jaarboek	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Inligtingskafeteria	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Toegangstoetse	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Somerskool	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.2 Tot watter mate beskou u dit belangrik om toegang tot die volgende aftrekkoppels vanaf die *Navorsing* etiket op die portaaltuisblad te hê?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

<i>Navorsingshulpmiddels</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>INDAGO</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Navorsing@Stellenbosch</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Biblioteekondersteuning</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Inligtingskafeteria</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>InnovUS</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Kontraknavorsing</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.3 Tot watter mate beskou u dit belangrik om toegang tot die volgende aftrekkoppels vanaf die *Gemeenskapsinteraksie* etiket op die portaaltuisblad te hê?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

<i>Gemeenskapsinteraksie</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Projekdatabasis</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.4 Tot watter mate beskou u dit belangrik om toegang tot die volgende aftrekkoppels vanaf die *Vir Bestuur* etiket op die portaaltuisblad te hê?

<i>Media Berigte</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Bestuursinligting</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Eerstejaarsakademie-moniteringstelsel</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Vergaderingstukke</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Inligtingskafeteria</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

3.3 Tot watter mate maak u gebruik van die volgende funksies?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 tot 'n baie groot mate is en 1 glad nie; en 0 aandui dat dit nie van toepassing is nie:

Betaalstrokie	5	4	3	2	1	0
Telefoonrekening	5	4	3	2	1	0
Internetrekening	5	4	3	2	1	0
Bestuur my wagwoord	5	4	3	2	1	0
Boschtelegram	5	4	3	2	1	0
Deel/bestuur my dokumente	5	4	3	2	1	0
My Biblioteek	5	4	3	2	1	0
My Sun-e-HR	5	4	3	2	1	0
My Web e-pos	5	4	3	2	1	0
My Stoorspasie	5	4	3	2	1	0
Beleide, Prosedure&Vorms	5	4	3	2	1	0
Personeelontwikkeling	5	4	3	2	1	0
Personeelverenigings	5	4	3	2	1	0
Vind	5	4	3	2	1	0

3.4 Tot watter mate het u die volgende hulpbronne, beskikbaar op die personeelportaal, aangepas?

Dui u siening aan op 'n skaal van 1 tot 5, waar 5 tot 'n baie groot mate is en 1 glad nie; en 0 aandui dat dit nie van toepassing is nie:

"Favorites"	5	4	3	2	1	0
Kortpadskakels	5	4	3	2	1	0
"My Profile"	5	4	3	2	1	0
Deel in onssosiale netwerke (e.g. Facebook)	5	4	3	2	1	0

3.5 Tot watter mate stem u saam met, of verskil u van, die volgende stellings in verband met die personeelportaal

3.5.1 "Dit is maklik om die inligting wat ek nodig het te kry."

-- Kies asseblief een --

Stem heeltemal saam

Stem meestal saam

Stem nie saam nie en verskil ook nie

Verskil meestal

Verskil heeltemal

3.5.2 "Die organisasie (uitleg) van inligting is duidelik."

-- Kies asseblief een --

Stem heeltemal saam

Stem meestal saam

Stem nie saam nie en verskil ook nie

Verskil meestal

Verskil heeltemal

3.5.3 “Dit is maklik om inligting te soek.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

3.5.4 “Die inligting wat ek nodig het is op datum.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

4. Kommentaar in verband met die Universiteit se personeelportaal

4.1 Waarvan hou u die meeste omtrent die Universiteit se personeelportaal?

4.2 Waarvan hou u die minste omtrent die Universiteit se personeelportaal?

4.3 Watter veranderinge sal u wil hê die Universiteit moet implementeer om die personeelportaal makliker te maak vir u om te gebruik?

5. Verskaf asseblief enige ander kommentaar wat u het in verband met die Universiteit se webwerf of portale

Ons wil u hartlik bedank vir u deelname en bydrae tot hierdie opname.

Kliek asseblief die ‘Indien’ knoppie.

Appendix H: Staff questionnaire (English)

Stellenbosch University - Website Survey

February 2011

Dear Staff member,

I am currently conducting research on the implementation of a content management system at the Stellenbosch University.

Through your participation in this survey, I hope to get a better understanding of the university community's information needs as it applies to the use of the Stellenbosch University's portals and websites. The Division for Information Technology of the University supports this study.

Your participation in this study is voluntary and anonymous. The questionnaire will only take 10 to 15 minutes of your time to complete.

Please contact me by e-mail at D.Steele@uct.ac.za should you have any questions about the questionnaire.

I hope you will assist us by completing this questionnaire.

Best regards,

Dianne Steele

1. Personal information

Please answer a few questions about yourself

1.1 Gender (please select)

- Male Female

1.2 Which of the following age categories apply to you?

- 30 or younger 31 - 40 41 - 50 51- 60 61 or older

1.3 Which of the following *employee categories* best describes your affiliation with the Stellenbosch University?

Academic/research staff

- Senior Management Dean of Faculty Head of Department
 Professor Associate Professor Senior Lecturer
 Lecturer Junior Lecturer Senior Researcher
 Researcher Junior Researcher

Other (Please state): _____

Administration/services staff

- Junior Staff Middle Management Senior Management

Other (Please state): _____

1.4 Which *Faculty* or *Administration/Services* best describes your involvement with the University?

Faculty

--Please select one --

- AgriScience
Arts and Social Sciences
Economic and Management Sciences
Education
Engineering
Health Sciences
Law
Military Sciences
Science
Theology

or

Administration & Services

-- Please select one --

Academic Administration
Academic Support
Archives
Art Gallery (and museum)
Bursaries
Central Mechanical Services
Centre for Student Counselling and Development
Commercial Services
Communication & Liaison
Community Interaction (Division for)
Conservatoire
Development & Alumni Relations
Facilities Management
Finance
Human Resources
Information Technology
InnovUS (Intellectual Property)
Institutional Research and Planning
Interactive Telematic Services
International Office
Legal Services
Library
Museum
Ombudsman
Prospective Students Centre
Research Development
Sport Performance Institute (SUSPI)
Student Affairs

**2. Your interaction with the Stellenbosch University's website
(<http://www.sun.ac.za>)**

2.1 How often do you use the Stellenbosch University's website at <http://www.sun.ac.za>?

(Please do not include usage of the staff portal [My.sun.ac.za](http://my.sun.ac.za).)

-- Please select one --

Continuously throughout the day
Once a day
A few times during the week
A few times during the month
Once a month or less
Never

2.2 Overall, how satisfied are you with this website?

-- Please select one --

Completely satisfied

Mostly satisfied

Neither satisfied nor dissatisfied

Mostly dissatisfied

Completely dissatisfied

Not applicable or No opinion

3. Your interaction with the University's staff portal

3.1 How often do you use the Stellenbosch University staff portal (My.sun.ac.za)?

-- Please select one --

Continuously throughout the day

Once a day

Two to three times a week

Two to three times a month

Once a month or less

Never

3.2 To what extent do you consider it important to have access to the following links?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

Teaching and Learning	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Research	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Community Interaction	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
For Management	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

3.2.1 To what extent do you consider it important to have access to the following drop-down links from the *Teaching and Learning* label on the Portal Home Page?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

Manage Modules	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Manage Curriculum	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Manage Students	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Webstudies	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
First-year Academy Monitoring System	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Exam/Test Information	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Timetables	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Academic Support	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Centre for Teaching and Learning	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
University Calendar	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Information Cafeteria	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Access Tests	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
Summer School	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

3.2.2 To what extent do you consider it important to have access to the following drop-down links from the *Research* label on the Portal Home Page?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

Research Support Tools	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
INDAGO	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Research@Stellenbosch	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Library Support	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Information Cafeteria	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
InnovUS	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Contract Research	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.3 To what extent do you consider it important to have access to the following drop-down links from the *Community Interaction* label on the Portal Home Page?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

Community Interaction	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Project database	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.2.4 To what extent do you consider it important to have access to the following drop-down links from the *For Management* label on the Portal Home Page?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

Media Articles	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Management Information	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
First-year Academy monitoring system	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Meeting documentation	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Information Cafeteria	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.3 To what extent do you use the following functions?

Indicate your view on a rating scale of 1 to 5, where 5 is very extensively and 1 not at all ; and 0 indicates not applicable:

Payslip	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Telephone account	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Internet account	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Manage password	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Boschtelegram	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Share/manage my documents	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Library	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Sun-e-HR	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Webmail	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Storage Space	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Policies, Procedures & Forms	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Staff Development	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Staff Association	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Find	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.4 To what extent have you customised the following resources available on the staff portal?

Indicate your view on a rating scale of 1 to 5, where 5 is very extensively and 1 not at all ; and 0 indicates not applicable:

<i>Favorites</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Quick Links</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>My Profile</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Share in our social networks (e.g. Facebook)</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

3.5 To what extent do you agree or disagree with the following statements with regard to the staff portal

3.5.1 "It is easy to find the information I need."

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable

3.5.2 "The organisation (layout) of information is clear."

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable

3.5.3 "It is easy to search for information."

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable

3.5.4 “The information I need is up-to-date.”

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable

4. Comments with regard to the University’s staff portal:

4.1 What do you like most about the University’s staff portal?

4.2 What do you like least about the University’s staff portal?

4.3 What changes would you like the University to implement to make the staff portal easier for you to use?

5. Please provide any other comments you have regarding the University’s website or portals

We wish to thank you for your participation in, and contribution to, this survey.

Please click the ‘Submit’ button.

Appendix I: Student questionnaire (Afrikaans)

Universiteit Stellenbosch – Webwerfopname

Februarie 2011

Beste Student,

Ek is tans besig met navorsing ten opsigte van die implementering van 'n inhoudsbestuurstelsel vir die Stellenbosch Universiteit.

Deur jou deelname in die opname, hoop ek om 'n beter begrip van die universiteitsgemeenskap se inligtingsbehoefte, soos dit van toepassing is op die gebruik van die Stellenbosch Universiteit se portale en webwerwe te kry. Die Afdeling Informasietegnologie van die Universiteit onderskryf hierdie studie.

Jou deelname aan hierdie studie is vrywillig en anoniem. Die vraelys sal slegs 10 tot 15 minute van jou tyd neem om te voltooi.

Kontak my asseblief deur middel van e-pos by D.Steele@uct.ac.za indien jy enige vrae het oor die vraelys.

Ek hoop jy sal ons help deur hierdie vraelys te voltooi.

Beste wense,
Dianne Steele

1. Persoonlike inligting

Antwoord asseblief 'n paar vrae oor jouself

1.1 Geslag (kies asseblief)

Manlik Vroulik

1.2 Onder watter van die volgende ouderdomskategorieë val jy?

20 of jonger 21 - 25 26 - 35 36 – 50 51 of ouer

1.3 Watter van die volgende beskryf jou status die beste as student by die Universiteit Stellenbosch?

-- Kies asseblief een --
Voorgraadse Student
Nagraadse Diploma Student
Honneursgraad Student
Meestersgraad Student
Doktorsgraad Student
Spesiale Student
Ander

1.4 Watter *Fakulteit* bied jou program by die Universiteit aan?

-- Kies asseblief een --
AgriWetenskappe
Ekonomiese en Bestuurswetenskappe
Gesondheidswetenskappe
Krygskunde
Ingenieurswese
Lettere en Sosiale Wetenskappe
Natuurwetenskappe
Opvoedkunde
Regsgeleerdheid
Teologie

2. Jou ervaring met die Universiteit se webwerf (<http://www.sun.ac.za>)

2.1 Hoe gereeld maak jy gebruik van die Universiteit se webwerf by <http://www.sun.ac.za>?

(Moet asseblief nie die gebruik van die studenteportaal **MyMaties.com** insluit nie.)

-- Kies asseblief een --
Aanhoudend deur die dag
Een keer per dag
Twee tot drie keer per week
Twee to drie keer per maand
Een keer per maand of minder
Nooit

2.2 Hoe gelukkig is jy oor die algemeen met dié webwerf?

- Kies asseblief een --
- Heeltemal gelukkig
 - Meestal gelukkig
 - Nie gelukkig of ongelukkig nie
 - Meestal ongelukkig
 - Heeltemal ongelukkig
 - Nie van toepassing of geen opinie nie

3. Jou ervaring met die Universiteit Stellenbosch se studenteportaal (*MyMaties.com*)

3.1 Hoe gereeld gebruik jy *MyMaties.com*?

- Kies asseblief een --
- Aanhoudend deur die dag
 - Een keer per dag
 - Twee tot drie keer per week
 - Twee to drie keer per maand
 - Een keer per maand of minder
 - Nooit

3.2 Tot watter mate beskou jy dit belangrik om toegang tot *MyMaties.com* te hê vir die volgende aspekte van jou studies?

Dui jou siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

<i>Eerstejaars – Vroeë Steun Opname</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Kwartaaldata's</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Vorderingsverslag M en D Studente</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Inlewer van Tesis/Proefskrif</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Registeervir Winter/Somerskool</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>LearnwellStudiehulp</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Beleide en Regulasies</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Biblioteek</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Lokaalrooster</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Modulerooster</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Klasgroepindeling</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>AkademieseBelangeraad</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Fakulteit</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My RGA</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>BestuurDrukkerkrediete</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Gradeplegtigheid</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My AkademieseGesiedenis</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Programme</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>StudeerOorsee</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.3 Tot watter mate gebruik jy die volgende funksies op MyMaties.com?

Dui jou siening aan op 'n skaal van 1 tot 5, waar 5 tot 'n baie groot mate is en 1 glad nie; en 0 aandui dat dit nie van toepassing is nie:

My Profiel	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Registrasie	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Web epos	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Gradeplegtigheid	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Eskamen/Toetsinligting (bv. Eksamenuitslae)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My AmptelikeDokumente	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Stoorspasie	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Biblioteek	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My SosialeNetwerke (bv. Facebook, MXit)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Rekenaardienste	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Kampus-akkomodasie	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Finansies	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Kampus	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
My Toekoms	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Studenteraad	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Verenigings	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Vind	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.4 Tot watter mate het jy die volgende hulpbronne, beskikbaar op MyMaties.com, aangepas vir persoonlike gebruik?

Dui jou siening aan op 'n skaal van 1 tot 5, waar 5 tot 'n baie groot mate is en 1 glad nie; en 0 aandui dat dit nie van toepassing is nie:

My Kampuskakels	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Deel in ons sosiale netwerke (bv. Facebook, MXit)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.5 Maak jy gebruik van MyMaties Mobile?

Ja Nee

3.6 Tot watter mate beskou jy dit belangrik om toegang tot die volgende te hê vanaf jou selfoon (MyMaties Mobile)?

Dui jou siening aan op 'n skaal van 1 tot 5, waar 5 baie belangrik is en 1 glad nie belangrik is nie; en 0 aandui dat dit nie van toepassing is nie:

Eksamenuitslae	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Eksamenrooster	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Eksamenlokale	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
Volgons op Twitter	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.7 Watter ander inligting sal jy graag wil hê moet die Universiteit na jou selfoon toe stuur?

3.8 Tot watter mate stem jy saam met, of verskil jy van, die volgende stellings met betrekking tot *MyMaties.com*:

3.8.1 “Dit is maklik om die inligting wat ek nodig het op die webwerf te kry.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

3.8.2 “Die organisasie (uitleg) van die inligting is duidelik.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

3.8.3 “Dit is maklik om vir inligting te soek.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

3.8.4 “Die inligting wat ek nodig het is op datum.”

- Kies asseblief een –
- Stem heeltemal saam
- Stem meestal saam
- Stem nie saam nie en verskil ook nie
- Verskil meestal
- Verskil heeltemal

4. Kommentaar in verband met *MyMaties.com*

4.1 Waarvan hou jy die meeste omtrent *MyMaties.com*?

4.2 Waarvan hou jy die minste omtrent *MyMaties.com*?

4.3 Watter veranderinge sal jy wil hê die Universiteit moet implementeer om *MyMaties.com* makliker te maak vir jou om te gebruik?

5 Verskaf asseblief enige ander kommentaar wat jy het in verband met *MyMaties.com*

Ons wil u hartlik bedank vir u deelname en bydrae tot hierdie opname.

Kliek asseblief die 'Indien' knoppie.

Appendix J: Student questionnaire (English)

Stellenbosch University - Website Survey

February 2011

Dear Student,

I am currently conducting research on the implementation of a content management system at the Stellenbosch University.

Through your participation in this survey, I hope to get a better understanding of the university community's information needs as it applies to the use of the Stellenbosch University's portals and websites. The Division for Information Technology of the University supports this study.

Your participation in this study is voluntary and anonymous. The questionnaire will only take 10 to 15 minutes of your time to complete.

Please contact me by e-mail at D.Steele@uct.ac.za should you have any questions about the questionnaire.

I hope you will assist us by completing this questionnaire.

Best regards,
Dianne Steele

1. Personal information

Please answer a few questions about yourself

1.1 Gender (please select)

Male Female

1.2 Which of the following age categories apply to you?

20 or younger 21 - 25 26 – 35 36 – 50 51 or older

1.3 Which of the following best describes your status as student at the Stellenbosch University?

-- Please select one --

Undergraduate Student
Postgraduate Diploma Student
Honours Degree Student
Masters Degree Student
Doctoral Degree Student
Special Student
Other

1.4 Which *Faculty* offers your programme at the University?

-- Please select one --

AgriScience
Arts and Social Sciences
Economic and Management Sciences
Education
Engineering
Health Sciences
Law
Military Sciences
Science
Theology

2. Your experience with the University's website (<http://www.sun.ac.za>)

2.1 How often do you use the Stellenbosch University's website at <http://www.sun.ac.za>?

(Please do not include usage of the student portal **MyMaties.com**.)

-- Please select one --

Continuously throughout the day
Once a day
Two to three times a week
Two to three times a month
Once a month or less
Never

2.2 How satisfied are you with this website?

-- Please select one --

Completely satisfied

Mostly satisfied

Neither satisfied nor dissatisfied

Mostly dissatisfied

Completely dissatisfied

Not applicable or No opinion

3. Your experience with the Stellenbosch University student portal (*MyMaties.com*)

3.1 How often do you use *MyMaties.com*?

-- Please select one --

Continuously throughout the day

Once a day

Two to three times a week

Two to three times a month

Once a month or less

Never

3.2 To what extent do you consider it important to have access on *MyMaties.com* to the following about your studies?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

<i>First Year's Early Support</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Term Dates</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Progress Report M and D Students</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Submission of Theses/ Dissertations</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Register for Winter/ Summer School</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Learnwell Study Aid</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Policies and Regulations</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>My Library</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Venue Time Tables</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Module Time Tables</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Class Group Allocation</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Academic Affairs Council</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>My Faculty</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>My RGA</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Manage Print Credits</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Graduation</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>My Academic History Programmes</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>
<i>Study Abroad</i>	5 <input type="radio"/>	4 <input type="radio"/>	3 <input type="radio"/>	2 <input type="radio"/>	1 <input type="radio"/>	0 <input type="radio"/>

3.3 To what extent do you use the following functions on *MyMaties.com*?

Indicate your view on a rating scale of 1 to 5, where 5 is very extensively and 1 not at all; and 0 indicates not applicable:

<i>My Profile</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Registration</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Webmail</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Graduation</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Test/Exam Information</i> (e.g. Exam results)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Official Documents</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Storage Space</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Library</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Social Networks</i> (e.g. Facebook, MXit)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Computer Services</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Campus Accommodation</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Finances</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Campus</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>My Future</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Student Council</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Societies</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Find</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.4 To what extent have you customised the following resources available on *MyMaties.com* for personal use?

Indicate your view on a rating scale of 1 to 5, where 5 is very extensively and 1 not at all; and 0 indicates not applicable:

<i>"My Kampusskakels"</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Share in our social networks</i> (e.g. Facebook, MXit)	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.5 Do you make use of *MyMaties Mobile*?

Yes No

3.6 To what extent do you consider it important to have access via your mobile (*MyMaties Mobile*) to the following?

Indicate your view on a rating scale of 1 to 5, where 5 is very important and 1 not at all important; and 0 indicates not applicable:

<i>Exam Results</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Exam Time Table</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Exam Venues</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○
<i>Follow us on Twitter</i>	5 ○	4 ○	3 ○	2 ○	1 ○	0 ○

3.7 What other information would you like the University to send to your mobile?

--

3.8 To what extent do you agree or disagree with the following statements with regard to the *MyMaties.com*:

3.8.1 “It is easy to find the information I need on the website.”

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable or No opinion

3.8.2 “The organisation (layout) of information is clear.”

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable or No opinion

3.8.3 “It is easy to search for information.”

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable or No opinion

3.8.4 “The information I need is up-to-date.”

-- Please select one --

Completely agree

Mostly agree

Neither agree nor disagree

Mostly disagree

Completely disagree

Not applicable or No opinion

4. Comments with regard to *MyMaties.com*

4.1 What do you like most about *MyMaties.com*?

4.2 What do you like least about *MyMaties.com*?

4.3 What changes would you like the University to implement to make *MyMaties.com* easier for you to use?

5. Please provide any other comments you have regarding *MyMaties.com*

We wish to thank you for your participation in, and contribution to, this survey.

Please click the 'Submit' button.