



UNIVERSITY OF KWAZULU-NATAL

**THE CENTRALISED APPLICATIONS SYSTEM: STAFF
AND STUDENT PERCEPTIONS AT DURBAN
UNIVERSITY OF TECHNOLOGY AND THE
UNIVERSITY OF KWAZULU-NATAL**

by

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A thesis submitted in fulfilment of the requirements for the degree

of

Doctor of Administration

College of Law and Management Studies

School of Management, Information Technology and Governance

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2018

DECLARATION

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ACKNOWLEDGEMENTS

I give thanks to the Lord Almighty for giving me the strength through trials and tribulations during this process of acquiring this degree. His presence, provision of wisdom and clarity made the production of this work possible.

I would also like to express greatest appreciation to my supervisor, my mentor, my sponsor, Professor FA Ruffin for nurturing me into what I am today. I could not have done this without her unwavering support.

To my family, for never giving up on me, your understanding gave me hope and inspired me to complete this project. My husband, Daluxolo Dzingwa for your love and support. To my children for understanding why I had to be absent even when you needed me most. I am highly favoured to have you in my life encouraging me go after my dream.

To the Vaal University of Technology management for providing me with the necessary financial support. The Research Directorate under the leadership of Dr. Nelana and in particular, Ms. Petro Van Walt, for all her efforts of ensuring that I complete this degree.

To Ms. Mihloti Mkhathswa for being there to cheer me up when I needed it.

To all the study participants for availing themselves and everyone who contributed somewhat towards this doctoral study, my sincerest gratitude.

ABSTRACT

Undergraduate admission processes in South African Higher Education Institutions (HEIs) have been characterised by numerous challenges and a series of negative consequences. One overarching challenge is improving the efficiency and effectiveness of the institutional management of admissions processes. The way in which late applications to institutions have been managed is also of grave concern for both the government and general public, notably, issues of affordability and access to HEIs remain highly contested in the sector. Centralising the applications process nationally, beyond the current dispensation in KwaZulu-Natal, is a solution proposed by the government but the question of whether a Central Application System (CAS) will sufficiently address these challenges calls for undertaking an empirical investigation of the phenomenon. This study evaluates current perceptions of the staff and student CAS users at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN), to ascertain, *inter alia*, whether the CAS is a fit and suitable application process model for HEIs. The researcher implemented a mixed method research design driven by a case study strategy, underpinned by post-positivist, pragmatism and constructivist worldviews and guided by an input-output-outcome meta-theoretical framework. Data were collected at DUT, UKZN and the Central Applications Office (CAO), from 312 participants, through semi-structured interviews, focus groups and a group interview with staff, and a student survey. Emerging themes from combined application of content, matrix and thematic analyses provide guidance on how to improve the CAS before it becomes operational for all HEIs. Stata 11.0 results from the surveys revealed a number of statistically significant relationships between relevant variables. Qualitative and quantitative results converge on the fitness of the CAS model for processing undergraduate applications. Findings highlight CAS challenges such as mismatched information; lack of compatibility of technology systems between the CAO and the two universities. This applied research produces knowledge on policy implementation strategies with recommendations for administrative enhancement of access to higher education.

Key words: Central Applications Systems, Application Processes

LIST OF ABBREVIATIONS

CACH	Central Applications Clearing House
CAO	Central Applications Office
CAS	Central Application System
CHE	Council for Higher Education
DAS	Decentralised Applications System
DHET	Department of Higher Education and Training
DOE	Department of Education
DUT	Durban University of Technology
ERP	Enterprise Resource Planning system
FET	Further Education and Training
HE	Higher Education
HEIs	Higher Education Institutions
HEMIS	Higher Education Management Information System
HESA	Higher Education South Africa
ICT	Information Communications Technology
IEB	Independent Examination Board
IT	Information Technology
ITS	Integrated Tertiary System
KZN	KwaZulu-Natal Province
NBT	National Benchmarking Test
NDP	National Development Plan
NHEIAS	National Higher Education Information and Application Service
NPC	National Planning Commission
NPG	New Public Governance
NPM	New Public Management
NSC	National Senior Certificate
NSFAS	National Financial Aid Scheme
PSET	Post-School Education and Training
PSET-CAS	Post-School Education and Training - Central Applications Service
QCTO	Quality Council for Trades and Occupations
RSA	Republic of South Africa
SAQA	South African Qualifications Authority
SATs	Standard Assessment Tests
SETA	Sector Education and training Authority
TVET	Technical and Vocational Education and Training
UCAS	Universities and Colleges Admissions Service

UJ	University of Johannesburg
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UNISA	University of South Africa
UOT	University of Technology
USA	United States of America
USE	Unified State Exam

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CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

In January 2012, Gloria Sekwena, a mother who was accompanying her son to apply for late admission to the University of Johannesburg (UJ) died in a stampede and more than 20 others were injured (Chetty, 2014:89; Jenvey, 2012:1). This incident subjected the Higher Education Institutions (HEIs) of South Africa to scrutiny regarding the lack of efficiency and effectiveness concerning their application processes. In light of the tragic events the government called for an overhaul of the application process, a motivating theme in this study. Chapter One provides the background and broad research problem, locating the higher education system within a political framework underpinned by inequality, unemployment and poverty, and remnants of the apartheid system. It also presents a brief outline of the application processes to HEIs in an attempt to lay the foundation for the research and states the research problem, research questions, objectives and the hypotheses to be subjected to empirical testing. Finally, the significance of the study is underscored, as is the methodology that will be applicable in attaining the objectives. To conclude this chapter is a broad framework of the study about the perceptions of staff and students about the CAS at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN). The next section provides a background of the study and the broad research problem.

1.2 Background to the Study and the Broad Research Problem

Admission processes in South African HEIs have faced a number of challenges as each year would-be students go to universities to make enquiries and seek admission. Potential students go from one institution to another, waiting in often long queues to collect and return forms for admission. This process is costly, frustrating and tiresome for both parents and students (Auddy & Mukhopadhyay, 2014:26) and incidents have occurred that make it clear the current application processes and procedures are inefficient and ineffective. Government has called for an overhaul of the application process by recommending a model of centralizing all undergraduate applications to the Post-School Education and Training (PSET) sector, with all matric students who wish to apply to HEIs submitting their applications for processing through this service. The PSET Central Application Service (PSET-CAS) was regarded by the Department of Higher Education and Training (DHET, 2016:32) as a “crucial move towards supporting informed access to universities and other post-school opportunities for students, and to make the choices and placement of students across the system more effective.” The service is currently being used through what is referred to the Central Application Clearing House (CACH) service, with full

implementation of the PSET-CAS scheduled for the year 2019 (DHET, 2016:76). To put key terms in context, the Central Applications System (CAS) herein refers to a centralised model or way of processing applications, a model currently only operational in KwaZulu-Natal (KZN) province through the Central Applications Office (CAO) for and on behalf of the KZN institutions, whereas the PSET-CAS refers to the intended service using the CAS model for applications processing nationwide. The Council for Higher Education (CHE) indicates that Higher Education South Africa (HESA) supports this initiative provided that all the admission remains entirely in the hands of the universities and not the CAO, which is state-funded CHE (2016:175).

The lack of efficiency and effectiveness when dealing with the admissions of undergraduate students is underpinned by the historical legacy of apartheid, the demise of which led to a call for the transformation of the Higher Education (HE) system (Schoole, 2013:2). Institutions have seen increased numbers of potential students seeking admission and changes the sector has experienced are largely the outcomes of policy reform to address a lack of access to tertiary education and to diversify the system (Cloete, 2014:2; Govinder, Zondo & Makgoba, 2013:5; Kioko, 2010:41). Admission processes in South African HEIs are fraught with challenges and, according to Altbach, Reisberg, and Rumbley (2009:39), the growth in student numbers has presented a major challenge for admission systems. This demand for education, unfortunately comes with a burden of having many applicants desperately applying in large numbers at the same time at to the same institutions, and the management of applicants has rendered the admission processes inefficient. Altbach *et al.*, (2009:39) indicates that HE is increasingly being viewed as a major engine of economic development, and access is simply getting as many people as possible to enrol in tertiary education. Hence, institutions have seen increased number of potential students seeking admission. Providing access to education is one of the solutions to economic development (Heaton, Amoateng & Dufur, 2014:101) and to lessening the gap between the rich and poor (Spaull, 2013:5). Heaton *et al.*, (2014:101) argue that although interventions have been made to eradicate inequalities with the HE sector, differences in practices and educational resources between the poor and wealthier schools persist. Mzangwa (2018:71) postulates that “students from poor social background in African countries such as South Africa are often from a particular race, mainly black, find it difficult to gain access to some HEIs.” Noting these contestations, the CAS intends to address challenges with the application and admission processes in the sector.

Another consideration is the varied admission policies of HEIs that ultimately inform the selection of students to programmes. The Education White Paper 3 (RSA 1997) set specific objectives to address equity in the system and the National Plan for HE (RSA, 2001) and for navigation of the

HE landscape. These policies will be discussed in detail in section 2.4, on HE policy framework section. The Department of Higher Education and Training (DHET) also released a draft framework on how distance education can be used to address the twin challenges of access and equity; where distance education can be used to address the bottlenecks that are experienced in the system, and in particular offer an alternative to the provision of education (DHET, 2012:11). These policies consider both the institutional needs meeting the enrolment targets and attempting to address the national imperatives of equity and redress. However, Heagney (2012:10) argues that while ensuring access is realised in the system, it is equally important that students be supported academically to complete their studies. These critical discussions inform different selection procedures. South Africa, however, is still confronted by high levels of inequality and a visible gap between the rich and the poor.

Nevertheless, the above discussions are not at the centre of the current study. Rather, it is concerned with the high number of students who are accessing HE, and how institutions manage them through their varied processes. One possible contributor to the problem is the high pass rate of matric students since the National Senior Certificate was implemented (Nel & Kistna, 2009:956), as prospective students amass at various institutions expecting to be accepted. According to Altbach, Reisberg, & Rumbley (2009:39), the growth in student numbers has presented a major challenge for systems, attributed to the HEIs being regarded as important in the economic development of the country (NDP 2011). This study on the perceptions of staff and students regarding the use of the CAS was conducted against the backdrop of the government seeing the CAS system as a solution to these challenges of admissions processes and procedures.

It is important to distinguish between the PSET-CAS from the CAS as signified in this study. On one hand, the PSET-CAS is a high-level national structure that denotes interactive stakeholders across the country. On the other hand, the CAS is the on-the-ground modality that actually processes applications from undergraduate students to the post-school sector. The countrywide PSET-CAS was targeted as operational on a national scale in 2019 but currently the CAS exists only in the province of KZN.

Providing access to HE would be a major solution to curbing unemployment amongst the country's youth and, as Altbach *et al.*, (2009:39) indicated, it has increasingly been viewed as a major engine of economic development, with access involving getting as many people as possible to enrol in tertiary education. Most of the socio-economic issues that are challenging South Africa are underpinned by the legacy of the apartheid system and HEIs have been identified as a major contributor to the economic development of countries that have high unemployment rates. Youth unemployment in particular is a key driver of the country's general unemployment pattern, with

18 to 30 year olds contributing 42%, as opposed to those of 30 years and older who have a corresponding rate of 17% (Mlatsheni, 2014:133). This demand for education comes with a burden of having too many applicants desperately applying in large numbers at the same time at these institutions, and the management of these applicants has rendered the admission processes inefficient.

In an attempt to increase access to the sector and to deal with inequalities of the past, the Department of Education (DOE) restructured the HE landscape in the country through a series of mergers and incorporations in the year 2000 (Yorke & Longden, 2004:14). Notably, the issue of access remains one of the greatest challenges facing the sector to date (Cloete & Moja, 2005:685). The lack of efficiency and effectiveness regarding how various institutions manage their respective admission processes has long been a matter of concern for all stakeholders, including the government, hence the proposal to implement a national CAS (Van Staden, 2013:3). As alluded to above, DHET wishes the CAS to process all applications for first-time entering students and all undergraduate applications to all three entities of post-school education, including HEIs, Adult Education Training Centres and Further Education and Training (FET) / Technical and Vocational Education and Training (TVET) Colleges. Both public and private providers will be included in this service provision, so that every prospective student wishing to enrol will send his or her application to this central facility for processing and evaluation. Again, the only active CAS in South Africa as of the writing of this dissertation is in the province of KZN.

Prospective students prefer certain institutions to the others, therefore concentrating numbers irrespective of whether students meet the eligibility criteria. The ranking of universities has been identified as yet another contributor to the inefficiencies within the application processes (Altbach, 2015:6) and prospective students would not apply to institutions that do not have a high ranking. This places a great administrative burden on particular institutions and while some prospective students apply early others apply late, even into the New Year when universities have finalised their selection processes. The latter group is referred to as “late applicants” or “walk-ins” (DHET, 2014), presenting numerous challenges as emotions escalate. Admission decisions remain the mandate of the institutions and several considerations, including university-specific programme requirements, are applied.

In 2012, the total number of registered students was 953,373, with an expected growth of 1.6 million by 2030 (DHET, 2015:26). The tertiary education sector had 2,369 institutions with 2,168,358 students in 2014 (DHET, 2014:3). And by 2015 the HE sector had recorded 50 TVET colleges and 26 public HEIs (DHET, 2014:3). These institutions are spread across all nine provinces, and with the exception of KZN applications are handled directly by the respective

institutions. KZN is managed by a non-government organisation (NGO), the CAO, which is only available for post-school institutions in the province. However, the CAS is planned to be fully operational in 2019 and aims to address service delivery shortfalls by enabling a streamlined access to PSET. How the CAS will be handled across the various provinces and whether other CAOs or similar NGOs will be created is unclear. The first phase of the CAS is the Central Applications Clearing House (CACH), which in the DHET's Annual Report (2014-2015:29), recorded 14,000 users and an enrolment placement of 29% by March 2015 in all public institutions.

The University of South Africa (UNISA) was one of the institutions that used the centralised applications model for their applications but has since stopped (Kgasoe, 2008:1). It offers open distance learning and reaches the entire African continent (Mohamedbhai, 2014:78). In an attempt to improve the application and registration processes for their 290,000 students, it moved its registration services to a central office in Sunnyside Park, tasked with ensuring that the applicants met the necessary requirements and submitted the required documents. CAO took over processing applications on behalf of UNISA, however, it found it was delaying registration (Kgasoe, 2008: 1). The CAS was proposed as a solution to solve most of these challenges and both DUT and UKZN are using it and are member institutions of the CAO. All the applications for undergraduate programmes have been managed by the CAO since its inception in 1998.

Various studies have shown numerous challenges in the admission processes in HE, which have been caused by a series of events facing the sector. For this reason, to clearly grasp the nature of these issues the HE sector has to be understood. The literature review in the next chapter thus focuses on debates around transformation that have taken place in the reshaping of the country's education landscape over the last 10 years regarding issues of access (Badat, 2011: 2; Walker & McLean, 2013:145). As the demand for HE increased, issues of redress, equality and funding have become high on the national agenda (Govinder *et al.*, 2013:5; Govender & Rampersad, 2016:43; Moodley, 2010:330; Sehoole, 2013:2). According to Palmer, Baxley and James (2011:11), in other countries such as the United States of America (USA), the United Kingdom (UK) and Australia, HE challenges revolve around the transformational agenda, though selection processes have not entirely changed. The researcher was unable to locate results of any existing studies on the CAS in South Africa, hence the use of the CAS has not fully been explored in South African HE landscapes. As with many other countries, South Africa has faced various challenges that informed the need to transform the system, leading to the mergers of several institutions (Bunting, Sheppard, Cloete & Belding, 2010:7). However, it would seem that not enough has been done to interrogate whether the CAS will resolve admissions challenges. The gaps in the

literature necessitate the undertaking of this study, and formulated the narrow research problem outlined below.

1.3 The Research Problem Statement

The admission of post-matric students to undergraduate programmes in South Africa has been characterised by inefficiencies and ineffectiveness in the application processes (DoE, 2002). The greatest driver of the massification project was the eradication of the socio-economic deficits created by the apartheid system (Akoojeeand Nkomo, 2011:120) and even when institutions indicate that they do not have spaces, desperate prospective applicants still want to hand over their applications (Kunene, 2017:1). A problem with ‘walk-in’ applications is that admission decisions are often made under great time pressure and in less than ideal situations (Kgasoe, 2008:1). An element of desperation and emotion goes with this high demand for admission. Following the stampede-driven death of a parent at UJ, admission came under intense national scrutiny. In 2012, the total number of registered students in South African post-school institutions was 953,373, with an expected growth of 1.6 million by 2030 (DHET, 2015:26). The tertiary education sector had 2,369 institutions with 2,168,358 registered students in 2014 (DHET, 2014). The imbalance between the demand and supply seemingly rendered post-school institutions inefficient and ineffective in managing application processes (Van Staden, 2013:3), which is problematic.

The Council for Higher Education’s (CHE) report on post-school education (2016:186) shows that the demand for university access and the problem of ‘walk-in’ applications means that admission decisions are often made under great time pressure and in less than ideal situations. In addition, institutions are forced to increase capacity when dealing with the large numbers of prospective students at various university sites. Also, an element of desperation and emotion goes with this high demand for admission. In light of these challenges the DHET recommended the implementation of a central management approach to applications processes at institutions of higher learning.

1.3.1 The implementation of the national CAS

This study is set against the backdrop of the DHET’s proposal to implement the PSET-CAS for all applications as it “will be a student-centred process that will take the needs of students to make multiple applications to various institutions in the country while paying one application fee. This centralised methodology is intended to support efficiency in the application process” to be nationally rolled out by 2019 (DHET, 2016:6). It is government’s aim to support effective access to post-school institutions. However, available literature shows the use of centralised applications

processes in countries such as Australia (James *et al.*, (2009:9), Kenya (Mohamedbhai, 2014:78), Tanzania (Mahundu, 2016:8) the USA and the UK (Dunne, King & Ahrens, 2014:1667; Mullen 2011:8) is greatly appreciated. The DHET's Annual Report of 2014/2015 indicates that the target functional and business requirements for the CAS were completed in March 2015 (DHET, 2015:43). The former Education Minister, Blade Nzimande, announced that the CAS would be set up to allow all prospective candidates to apply once, noting that the application system would be phased in over the period of three years, and fully realised in 2019 (CHE, 2016). A rigorous search for empirical studies about the CAS in the South African context yielded scant results, hence the needed for looking at the CAS in view of the stated challenges.

1.3.2 The Application processes

Online platforms such as websites and other application systems have been instrumental in application processes (Council, 2014:9; Zhang & Hagedorn 2011:8). Institutions have implemented different Enterprise Resource Programme (ERP) systems to meet their operational and business objectives (Olugbara, Kalema & Kekwaletse, 2014:65). This research looks into how this concept of centralisation is operationalised in KZN, to inform the CAS implementation of HE applications processing moving forward, particularly on a national level. Central to this study is the efficiency and effectiveness of the CAS process. Effah, and Liu (2014:2) contend that “a fundamental challenge for higher education admission is how to provide quality processes based on effective information systems in order to attract highly qualified applicants.” The effort here is not to shape this into an Information systems and technology thesis, but rather to deepen the research problem to examine the role of synchronised systems in improving public administration and management of applications processing in a way that enhances the efficiency and effectiveness of the CAS. The study evaluates the current perceptions of staff and student users at DUT and UKZN to determine whether the CAS will bring about much-needed efficiency and effectiveness to the application process. Although several studies bring to light admission challenges (Mouton, Louw & Strydom, 2013:286), and some broadly on access and widening participation (Leibowitz & Bozalek, 2014:12), they do not address the efficiency and/or effectiveness of an application and subsequently the admission model/s to be adopted. As a result, not much is documented about the efficiency or effectiveness of the CAS as it currently stands. This study therefore aims to evaluate the current perceptions of users, i.e., institutions in KZN using the CAO, to find out if the CAS will bring about much-needed efficiency and effectiveness to the application process. In light of the research problem, the study will answer the following research questions and achieve the set research objective, which are next delineated.

1.4 Research Questions and Objectives

In light of the narrow research problem which flowed from the literature review, certain research questions and objectives were formulated, and the hypotheses were established.

Table 1-1: Research Questions and Objectives

Research questions	Research objectives
What are the perceptions of staff and students about the use of the Central Applications System (CAS) in the application processes at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN)?	Determine the perceptions of staff and students about the use of the Central Applications System (CAS) in the application processes at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN).
What are the factors that facilitate or hinder efficiency and effectiveness of the CAS?	Discover the factors that facilitate or hinder the efficiency and effectiveness of the CAS.
To what extent is the CAS model a fit system for DUT and UKZN?	Assess whether the CAS model is a fit system for DUT and UKZN.
How can the CAS bring efficiency and effectiveness to the application processes for HEIs in South Africa?	Examine whether, and if so, how the CAS can bring efficiency and effectiveness to the application processes for HEIs in South Africa.
Hypotheses	
H ₀ : The CAS system does not bring efficiency and effectiveness to the application process.	
H ₁ : The CAS system brings efficiency and effectiveness to the application process.	

The following section highlights the significance and rationale of the study.

1.5 Significance and Rationale of this Study

The DHET is in the process of implementing the CAS for all applications to HEIs in South Africa. This may appear to be one of the reactions to a crisis by government (Peters *et al.*, 2011:4). Following an extensive literature review, the researcher could not find studies on the CAS phenomenon in the South African context, i.e., insufficient empirical research has been conducted on the topic. This particular study's significance is that it deals with social phenomena that may affect HE policy frameworks and practices about the efficient and effective management of these processes. The CAS was designed to facilitate and process the applications thus minimise inefficiencies and ineffectiveness. There also seems to be a knowledge gap regarding the use of the CAS and the CAO. Internationally, several studies have been conducted on the CAS, such as Australia (Palmer *et al.*, 2011:9; Coates & Friedman, 2010:26) and the USA, which use the Common Applications System and the Universal Applications System respectively (Clinedinst, 2008:9; Heagney, 2012:11). Extensive research has been conducted in the UK into the Universities and Colleges Admissions Service (UCAS), including its benefits for HEIs and

colleges (Bethell & Zabulionis, 2014:26; Boliver, 2013:344; Clark & Brown, 2008:83; Dunne, King & Ahrens, 2014:1667). These studies focused largely on the efficiencies and inefficiencies of the UK application process, as the system has been found to be slow and inefficient (Bethell & Zabulionis, 2014:26).

This study on the CAS for public HEIs in South Africa aimed to determine if this would be a fit system for the country. Should the system fail to deliver on its mandate of providing effective and efficient application service for all stakeholders it would be a setback for HE, which may come at a high price. This study is important as it submits empirical findings and recommendations which will go a long way in assisting decision-makers to make informed decisions regarding the rolling out of the CAS across all post-school institutions in the country. This study narrows the knowledge gap about the CAS in the South African context. Application processing efficiency and effectiveness are crucial, as they will ensure that HEIs are not subjected to complications and negative scrutiny. This study is relevant, as serious student unrest has claimed lives in South Africa during campaigns such as #feesmustfall and #Rhodesmustfall. It is therefore important that these findings are highlighted to inform stakeholders about the CAS model.

The review of the literature serves as a foundation for setting out the issues, within which the research problem and objectives are contextualised. In addition, varying perspectives on the topic under investigation will be presented. Garrard (2013:4) argues that this review of processes consists not only of reading but also of writing, analysing and synthesising what other scholars are saying about the topic. Furthermore, the undertaking of the study will inform the South African HE sectors about the factors to consider when implementing the CAS countrywide. The empirical findings from DUT and UKZN will provide a deeper understanding into the CAS and how it operates or fails to operate. The staff and student perceptions about the CAO can provide a platform and an opportunity to embrace what is currently working, while taking note of recommended changes. If these lessons are not taken into consideration the CAS process may not successfully succeed (Kgasoe, 2008:1).

The provision of an effective and efficient service is for the benefit not only of the DHET but also for the institutions themselves and their stakeholders, staff and students. The DHET needs to ensure that service delivery is provided in an inclusive and equitable way (Govender & Rampersadh, 2016:43). The image of an institution can become tainted if it is associated with negative incidents, but if customers receive a good service they are more like to choose that particular institution (Heagney, 2012:10). The research methodology is discussed next.

1.6 Research Methodology

A mixed method design was used to answer the research questions, achieve the objectives and test the hypotheses, i.e., both a qualitative and a quantitative approach were used. Both constructivist and post-positivist philosophical worldviews underpinned this study, being reflective as research methodologies applied in this mixed method study, which included the following methods, interviewing staff at CAO, DUT, and UKZN as well as surveying students at DUT and UKZN (Scotland, 2012:10; Wahyuni, 2012:72). This study is a strategy single-case (embedded) design, which consulted staff at CAO, DUT and UKZN, and surveyed students at both universities.

The participants were purposively selected because they all had knowledge of the CAS. The qualitative data were collected during two in-depth interviews at DUT and two at UKZN, which were held with senior staff members. One group interview was held with senior staff at CAO.

Focus groups were conducted at DUT with five staff members, while a second focus group was conducted with eight staff members at UKZN. Quantitative data were collected using a self-completion survey, which was administered to 287 first and second year students at DUT and UKZN. At two respective universities (DUT and UKZN), 150 surveys were distributed respectively (DUT-140 and UKZN-147). For the qualitative component a non-probability sampling procedure employed convenience, purposive and snowballing sampling techniques. For the quantitative component stratified sampling technique was used.

The next section provides the key terms and definitions.

1.7 Key Terms and Definitions

The key terms emanated from the literature review, the interviews and focus groups, and subsequently the data analysis process. It then became evident that delineation and contextualisation of the terms should be outlined to enhance the reader's understanding of the concepts. It was also important to explain the terminology used, to provide the basis for a comparative analysis of the categories and themes, and make clear the concepts used. Key terms and definitions are therefore delineated in Table 3.2 below, as extracted from the literature.

Table 1-2: Key terms and definitions

TERM	DEFINITION
CAS effectiveness	Provision of quality service, enabling meeting of targets, and gaining information through high quality consistent and reliable data (Blasch, Valin & Bosse, 2010:1; Stewart-Weeks, 2015:17).
CAS Efficiency	Optimising students' satisfaction through conveniently available information and timeous responses, mainly through an online platform (Damanpour & Aravind, 2011:426; Clinedinst and Hawkins 2011: 28)
Central Applications Service	A single application service which provide affordable effective placement of students to undergraduate programmes in the Post School Education System. This service is envisaged to provide efficient application processes to multiple institutions with one application fee (DHET, 2016:6)
Centralised Applications System	Institutions channel their applications through one single point of entry (Bethell & Zabulionis, 2014:26-29, Boliver, 2013:344; Clark & Brown, 2008:83; Dunne, King & Ahrens, 2014:1667).
Decentralised Applications system	Universities manage their application processes directly, i.e., students send their application forms directly to institutions (Bethell & Zabulionis, 2014:26-29; Boliver, 2013:344).
Effectiveness	"... doing the right things" which is setting the targets for achieving the overall goals or effects (Førsund, 2013a:4-10; Valin & Bosse, 2010:1).
Efficiency	Doing things right, which refers to outputs, or to do something well, without wasting time (Førsund, 2013a: 4-10).

Source: Extracted from various scholarly work as indicated

The above key terms are reflected in all the chapters in this study, and assisted with a better alignment of the various concepts and constructs. The Chapter Outline is discussed next. This Chapter is then concluded in section 1.9 below.

1.8 Chapter Outline

The chapters in the study cover the following areas

1.8.1 Chapter One

Chapter One has introduced the topic of the study, provided a research background, outlined the broad research problem, and presented the research questions, objectives and hypotheses. It also outlined the methodology framework and discussed the significance of this study.

1.8.2 Chapter Two

Chapter Two reviews the literature with the aim of contextualising what is already known and highlighting the gaps in knowledge, which the research questions aim to address. In this regard, the history of the debates on issues of access to HE since 1994 will be presented. It sets the tone and unpacks a number of multi-dimensional challenges facing HE in South Africa. The chapter also give a brief background on the two institutions central to the study, that is DUT and UKZN. Funding challenges are presented followed by the enrolment planning in public institutions of South Africa.

1.8.3 Chapter Three

Chapter Three will outline the complexities of the application processes and the context within which the CAS is proposed to take place. Fundamental to understanding the application process. The different types of application processing models will be detailed in this chapter.

1.8.4 Chapter Four

Chapter Four will unpack the available theories in the realm of Public Administration for measuring efficiency and effectiveness in the public sector. The meta-theoretical framework will be presented.

1.8.5 Chapter Five

Chapter Five will detail the research methodology used in the study, outlining the philosophical worldviews, giving an overview of, and justification for, the selection of this case study, and outlining sampling strategies and techniques. It describes the data collection process and data analysis, including the statistical procedures utilised, and explains and justifies issues of reliability

and validity for both qualitative and quantitative studies. This chapter further details ethical considerations and limitations of the study

1.8.6 Chapter Six

Chapter Six presents and interprets the qualitative findings of the study in relation to the research questions and objectives from the perspective of staff. The results of the qualitative study are presented, with matrices being used as a tool for the data analysis.

1.8.7 Chapter Seven

Chapter seven presents and interprets the quantitative findings of the study in relation to the research questions, objectives and the proposed hypotheses from the perspective of students. The collection, analysis and interpretation of the chapters was carried out simultaneously with equal weight.

1.8.8 Chapter Eight

Chapter Eight will present a cross-unit analysis of perceptions of staff and students across DUT and UKZN, which will be used to identify certain common and unique categories and perspectives. A methodological triangulation process follows this. There is first primary qualitative multi-method triangulation and then mixed method triangulation showing convergence and divergence between primary qualitative data, secondary qualitative data and primary quantitative data. This triangulation will facilitate a greater overview of the perspectives of both staff and students. This chapter will also present paradigmatic and theoretical triangulation to show how different worldviews and theories contributed to achieving the set research objectives. Finally, this chapter details and discusses themes identified from the data analysis process. A section on the proposed location of the PSET-CAS will be discussed followed by the conclusion.

1.8.9 Chapter Nine

Chapter Nine begins with a recap of the research questions, objectives and the hypotheses, to give the reader coherence of the entire study. It gives an overview of the research findings, conclusions from each finding and draws recommendations from each. Most significantly it will highlight the significance of the study and policy implications. In addition, it presents recommendations for future studies. This will be the final chapter which concludes the study.

1.9 Chapter Summary

This chapter presented the background to and the broad problem of, the study. A brief literature review placed the study within a specific theoretical framework, and the research problem was set out. The four research questions and objectives were stated, as were the proposed hypotheses. Both the significance and rationale of the study were outlined, and delimitations of the study presented. A brief synopsis of research methodology was provided before key terms and definitions were clarified and upcoming chapters outlined. The next chapters provides the literature review and discusses the concepts and theories underlying the study.

CHAPTER TWO: NAVIGATING ACCESS TO HIGHER EDUCATION

2.1 Introduction

The tragic story of Gloria Sekwena, a parent who died in a stampede at the University of Johannesburg is articulated in Chetty (2014:1) as an event “that embodies the broad crisis in an overstretched higher education system as it struggles to extend access to disadvantaged youth, together with the desperation of poor people who view a university qualification as an escape route from poverty.” This chapter will unpack how access to South African Higher Education is navigated, reviewing available literature on the background and historical underpinnings within which the HE system is affected and subsequently influences access in general. The review of the literature serves as a foundation for setting out the issues within which the research problem and objectives are contextualised. In addition, varying perspectives on the topic under investigation will be presented. Garrard (2013:4) argues that the review processes consist of reading and writing, analysing and synthesising what other scholars are saying about the topic. This puts into perspective and contextualises access to the system and how these politics may affect the operation of the Central Applications System (CAS), in addition to assisting in achieving the research objectives. Policies governing the HEIs will be discussed and a brief comparison of other countries’ HE systems and contestations will be reviewed. The chapter will also provide brief history of the Durban University of Technology (DUT) and University of KwaZulu-Natal (UKZN), as these two universities are at the centre of the study and aligned to the study objective. It presents a background of the political sphere in navigating access to HE followed by the complexities of the application processes in the subsequent chapter. The chapter summary will conclude the first of the literature review chapters.

2.2 Higher Education in South Africa

To set the tone, Mohamedbhai (2014:68) eloquently contends that “no country in the world has been challenged as much as South Africa in its attempt to overcome the overtly racial inequity in higher education after the end of apartheid in 1994.” To add, Mohamedbhai (2014:74) further indicates that a substantial number of students from African countries choose to study in South Africa more than other countries on the continent. Public institutions, which are state-funded, are accountable to the government because they receive public funding (Govinder *et al.*, 2013:8, Leibowitz & Bozalek, 2014:12). The challenges facing the South African HE system are alluded to in the White Paper, which outlined the framework of transformation of HE. Redress of past

inequalities, and transforming HE to meet national needs (NPHE, 2001:4) is an important point of discussion. HEIs have a role to play in economic development, which is to empower the youth with much needed skills (Câmpeanu, Dumitrescu, Costică & Boitan, 2017:749). They have a mandate not only to contribute to economic growth but also to assist in reducing unemployment (Nicolaidis, 2011:1045). According to Dorasamy and Balkaran (2013:280), “students’ perceptions can ‘add value’ for higher education institutions that are committed to meet the needs of students, employers and government.” In addition to how important access to HE is, if an 18-24 year old youth does not receive a post-secondary qualification he or she may not secure full-time employment, perpetuating poverty (Spaull, 2013:6). HEIs in South Africa offers an array of qualifications consisting of certificates, diplomas, and degrees at both undergraduate and postgraduate level (Matsolo, Ningpuanyeh & Susuman, 2018:1). However, because the CAS will only be managing the application for undergraduate programmes at these institutions this study will focus on the undergraduate qualification application process. Fisher and Scott (2011:1), citing Cloete (2009), emphasise that “700,000 youths with matric who officially qualify for admission to HE are part of the 2.8 million young people who are not employed.” Issues relating to matric outcomes will be discussed in detail in the next chapter.

On one hand, post-secondary education is associated with financial benefits (Oreopoulos & Petronijevic, 2013:41; Wohn, Ellison, Khan, Fewins-Bliss & Gray, 2013:2), on the other the costs associated with attaining education are high (Oreopoulos & Petronijevic, 2013:41). It is therefore not surprising that HEIs have been identified as major contributors to the economic development of a country that has high unemployment rates (NPC Vision, 2030). Public policy is then formulated to address these inequalities in democratic state. The National Development Plan (NDP) identified and provided set objectives for how the government intends to address these challenges. An aspect of the NDP’s Vision 2030, as related to this study, is the desire to have a developed country with an HE system that will enable its citizens to fulfil their potential and encourage economic growth and development. Universities are seen as key to driving this development (NDP, 2011:262), important not only for work and teaching the skills that are required by the labour market, but also for society to be economically developed, thus reducing poverty while promoting lifelong learning. The new government of the post-apartheid era had to address the triple challenges of inequality, poverty and unemployment (Dorasamy & Balkaran, 2013:280). Although there have been some changes much still needs to be done. As indicated, the targets for transformation and reconstruction were elevated by the newly elected government.

According to Schoole (2013:2), the new government adopted the Weberian protocol of bureaucracy to deliver principles of efficiency as it is implemented in the private sector. This is

not easy to achieve as old ideas still influence the system, and the innovative process to foster the new transformation agenda was not completely implemented. Lack of transformation in HE system remains riddled with racial imbalances (Motala, Dieltiens, Carrim, Kgobe, Moyo & Rember, 2007:50). Just as institutions are confronted with addressing participation from diverse groups the same ones need to strive for equitable representation of all social groups of both staff and students (Mdepa & Tshiwula, 2012: 19-20). Badat (2010:2) argues that education is still overwhelmed by a number of inequalities, for instance the schooling system has a clear divide between pupils in terms of their wealth, geographical location, language and socio-economic makeup, and these disparities shape their performance (Spull, 2013:3). This trend is indeed visible in the HE sector, where participation rates remain unequal (Chetty, 2014:97; Govinder *et al.*, 2013:1; Matsolo *et al.*, 2018:4). According to McGhie (2017:408), “historically, the universities were divided into white universities for white students only and black universities for African, Indian and coloured students.”

In order to increase access and address past inequalities, the DoE embarked on a major restructuring of the sector through mergers to encourage inclusivity in HE (Bunting *et al.*, 2010: 7). For Chetty (2014: 93), the way to address low levels of intake of black students at universities is to address the underlying inequalities such as the reasons for the poor maths and physical science outcomes without proper facilities to conduct basic experiments. Mohamedbhai (2014:72) argues that “Massification has had negative consequences on almost all of the public higher education institutions in Africa, including physical infrastructure, staffing, educational quality, graduate employment, and student mobility.” As the demand for HE increased, issues of redress, equality and funding became high on the national agenda (Govender & Rampersad, 2016:43; Moodley, 2010:330; Sehoole, 2013:3; Spull, 2013:5). Youth unemployment in particular is a key driver of South Africa’s general unemployment pattern, with 18 to 30 year olds contributing 42%, as opposed to those 30 years and older who have a corresponding rate of 17% (Mlatsheni, 2014:133).

2.3 South African Higher Education Framework

A brief overview of relevant policies is set out in this section on South African Higher Education Legislative and Policy Frameworks. A number of policies govern public institutions, which inform regulation of HEIs therefore it is important to underscore some of those that give effect to a coordinated system which addresses inequalities, and most importantly deal decisively with the challenges as indicated in the previous section. Table 2.1 outlines some of the policies by which the South African legislative and policy framework for HE is governed. In addition to the

legislative framework, each institution will stipulate its relative admission policies to guide access, as to be discussed in the next chapter, on the application process.

Table 2-1: South African legislative and policy frameworks for Higher Education in South Africa

SOUTH AFRICAN LAW AND POLICY FRAMEWORKS	PURPOSE RELEVANT TO THIS STUDY
White Paper 3 on Higher Education (DoE, 1997)	This paper detailed by the DoE was to address the challenge of massification of HE, and more importantly to focus on the redress of the unequal state of or education system to a more integrative one. The conceptualisation of the CAS grew out of the aims of this White Paper.
Higher Education Act 101 of 1997	This Act facilitated a single co-ordinated sector for the HE sector. The Act regulates establishment of the governance structures and funding of HEIs. The composition as well the functioning of the CHE. The Act also governs the registration of private HEIs.
Draft National Plan for Higher Education (NPHE) in South Africa (DoE 2001)	The HE system achieves the transformation objectives set out in the White Paper and is responsive to societal interests and needs. Most importantly and relevant to this study, this plan is set to develop a HE system that will “promote equity of access and fair chances of success to all who are seeking to comprehend their potential through HE, while eradicating all forms of unfair discrimination and advancing redress for past inequalities” (p .6)
Minimum admission requirements for Higher Certificate, Diploma and Bachelor’s Degree (DoE, 2005)	This policy outlines the statutory minimum admission to Higher Certificates, Diplomas and Bachelors’ degrees that require the NSC from January 2009. This is applicable for both private and public HEIs. Admission requirements are fundamental to the operation of the CAS.
Policy for the Post-school and Training Central Application Service (DHET 2016)	This policy provides legislative context to the establishment of the CAS for DHET. The CAS is the case under study in this dissertation.
National Qualifications Framework Act, 2008 (Act No. 67 of 2008)	Provides for the National Qualifications Framework (NQF), the South African Qualifications Authority (SAQA) and the Quality Councils for qualifications and the quality assurance of these qualifications required.

Sources: As indicated per policy and legislative framework.

Table 2.1 provides an overview of the evolution of selected South African HE policies that directly relate to this study. They show an evolution of policymaking that culminated in the apparent need for a CAS. The DHET 2016/17 annual performance plan indicates a need not only to expand but also to better manage applications across the system, resulting in the implementation of the CACH as the first phase of the CAS (DHET, 2016:13). The CAS is currently operational only in the province of KZN, however, DHET envisages CAS implementation countrywide as indicated in the policy for post-school and training CAS (DHET, 2016). Transformation in the sector is presented next.

2.4 Transformation in Higher Education South Africa

To exacerbate the imbalances of participation in HE, Cloete (2014:1359) indicates significant differentiation of participation between white and black student enrolment, which is why setting and achieving the enrolment targets has financial implications for HEIs. According to Cloete, and Mouton (2015:34), three categories of university arose from the measure process, namely, universities, comprehensive universities and universities of technology (UoTs). As indicated in the introduction, both DUT and UKZN were merged and, as Mbeo and Rambe (2016:608) indicate, that UoTs came into being as part of a major reconfiguration of the higher education landscape through mergers that took place from 2004. The two universities that are the subjects of this study, DUT and UKZN, are a result of the merger process (Moodley, 2010:330), which actually began in 1999 to uphold the principles of equity, inclusivity and equality in the sector. These mergers addressed deeply rooted inequalities, and transformed the institutions in both shape and size (Govender & Rampersad, 2016:43; Moodley, 2010:330). Mergers are an effort to provide equal access to education, and to address the principles of equity and inclusivity in education institutions.

In terms of governance, universities in South African operate in a similar manner, and according to Flowerday, Johl, and Von Solms (2014:136), “DHET has implemented a complex and comprehensive framework to steer the public HE sector as defined in the HE Act.” There is council which oversees the smooth running of the university mandated by the DoE, with a chairperson appointed to make sure that governance is restored and the university meets its mandate. There is also a chancellor, vice chancellor (VC), principle and rector with head of each institution reporting to council, on strategic vision. Universities will typically separate the academic and administrative operations, with the deputy vice principle academic and research and the deputy vice principle governance and operations as senior executive members of staff who support the VC. Universities have an executive dean of students, looking after students’ needs, while the registrar is the custodian of all policies governing the universities. This study focuses on the fitness of the CAS model as perceived by the two universities, DUT and UKZN, a brief background of which follows.

2.4.1 Durban University of Technology and University of KwaZulu-Natal

Both DUT and UKZN are using the CAS for their applications, each being a member of and partner to the CAO (CAO, 2018) with DUT a UoT and UKZN classified as a combination of traditional universities. These two different institutions will thus bring different perspectives on the use of the CAS. Mohammed Lappa Sultan (ML Sultan) merged with Technikon Natal and

formed the Durban Institutes of Technology, which changed its name to the Durban University of Technology (DUT) in 2002 (Govender & Rampersad, 2016:43; Underwood & Thomas, 2015:21), while UKZN was also a result of the merger process. According to Gillard, Saunders, Terblanche and Sukel (2012:4), “the University of KwaZulu-Natal (UKZN) resulted from the merger of the University of Natal (UN) with the University of Durban-Westville (UDW).” Both institutions offer both undergraduate and postgraduate qualifications.

DUT has six faculties, namely, Management Sciences, Engineering and the Built Environment, Health Sciences, Accounting and Informatics, Arts and Design, and Applied Sciences. These faculties are based on different campuses and in different cities in KZN province (Dorasamy & Balkaran 2013:270), though UKZN became one of the largest universities in South Africa, with a wide demographic representation characterised by a mix of Africans, Coloureds, Indians and Whites (Moodley, 2010; Munro, Quayle, Simpson & Barnsley, 2013). Munro *et al.*, (2013:170) indicate that the “University of KwaZulu-Natal (UKZN) is a South African public HEI with a mission to be meaningfully engaged with society and demographically representative,” adding that, like other HEIs in South Africa, it is concerned with “reducing student academic failure, enhancing retention and throughput”. Arnolds, Lillah, and Stofile (2013:1) suggest that transforming higher education through mergers is not a phenomenon that is uniquely South African but rather it joined many other countries in facing various challenges that informed the need to transform the system, leading to the mergers of several institutions (Bunting, Sheppard, Cloete & Belding, 2010:7). Table 2.2 gives an overview of the merged institutions, helping to locate the two institutions which are central to this study.

Table 2-2: Merges of South African Higher Educations Intuition

Original institutions in 2000	New institution after merger
Cape Technikon	Cape Peninsula University of Technology
Peninsula Technikon	
University of Port Elizabeth	Nelson Mandela Metropolitan University
Port Elizabeth Technikon	
University of Transkei	Walter Sisulu University
Border Technikon	
Eastern Cape Technikon	
ML Sultan Technikon	Durban University of Technology
Natal Technikon	
University of Durban-Westville	University of KwaZulu-Natal
University of Natal	
Potchefstroom University	North-West University
University of the North-West	
Rand Afrikaans University	University of Johannesburg
Technikon Witwatersrand	
Technikon South Africa	University of South Africa
University of South Africa	
University of the North	University of Limpopo
Medical University of South Africa	
Vista University	Disestablished; with campuses incorporated into 7 other universities

Source: Bunting *et al.*, (2010:7).

Prior to the merging process, South Africa had a total of 34 public institutions. The mergers saw 20 institutions being disestablished, while others were incorporated into other campuses such as Vista university, resulting in a total of 23 HEIs in the period 2000 to 2008 (Bunting *et al.*, 2010:7), so today there are a total of 26 public HEIs, funded by government and having to embrace the specific regulatory provisions as set in the Higher Education Act of 1997. However, inadequate government funding has been identified as a major challenge (Shrivastava & Shrivastava, 2014). Acknowledging the work of Mapasela and Hay (2005), Arnolds *et al.*, (2013:3) indicates that other motivations for the process of merging institutions in South Africa included increasing student enrolments, responding to the change in the interest of the society, and meeting both national and global opportunities as far as technology was concerned.

Enrolment planning is discussed next.

2.5 Enrolment Planning in Public Higher Education

Public institutions differ in their enrolment trends, some averaging 7,000 students, others 60,000 (DHET, 2013). A number of inequities are visible in student participation in the HE sector, as indicated above. Mohamedbhai (2014:68) argues that one of the measures the sector used to redress inequity the imbalances was through the principle of affirmative action in the selection and placement of students. Postulated by Simões and Soares (2010:2), HEIs faces complex challenges, as sector undergoing major transformations, such as change in the demand patterns for students, as well as global competition amongst institutions. In addition, Favish and Hendry (2010:269) claim that transformation principles require that inequalities be addressed, even though the admission policies take into consideration those that are historically disadvantaged. As of 2015 in South Africa, the HE sector records 50 TVET colleges and 26 public HEIs (DHET, 2016). Enrolment planning, therefore, has to be monitored and governed by public institutions receiving funding in a form of subsidy from government. In 2012, the total number of registered students was 953,373, with an expected growth rate of 1.6 million by 2030 (DHET, 2015:26). The tertiary education sector had 2,369 institutions with 2,168,358 students in 2014 (DHET, 2014). These institutions are spread across all nine provinces.

Between the years 2009 and 2015 public HEIs increased enrolment by 147,436 (DHET 2015:8), but a number of inequities are visible in student participation in the HE sector. Mohamedbhai (2014:68) argues that one of the measures the sector used to redress inequity the imbalances through the principle of affirmative action in the selection and placement of students. To exacerbate the imbalances of participation in HE, Cloete (2014:1359) indicates significant differentiation of participation between white and black student enrolment, which might explain why setting and achieving the enrolment targets has financial implications for HEIs.

The complexities of the admission to HEIs also explain why some institutions did not meet the national enrolment target for a projected increase for first-time entering students to HEIs (DHET, 2016:8). The 2014 audited data indicates a -3% under-enrolment on headcounts (DHET, 2016:6) HEIs need to maintain set targets allowed by the department of Higher Education as this has direct implications for funding and resources (DHET, 2016:7). Both DUT and UKZN have failed to meet the target, as indicated below. UKZN is one of the institutions that had significantly over-enrolled with more than the 2% deviation allowed in 2014 by + 1,697 more than the allowed headcounts (DHET, 2016:8).

Table 2-3: Ministerial Statement of Headcount Enrolment 2009 - 2014

INSTITUTION	Ministerial Statement on Student Enrolment Planning 2011/12-2013/14					Ministerial Statement on Student Enrolment Planning 2014/15-2019/20			
	Actual					Actual	Target	Deviation	
	2009	2010	2011	2012	2013	2014	Projected target 2014	Deviation from 2014 target (nos)	Deviation from 2014 target (%)
CPUT	30,958	32,167	32,506	33,509	33,477	33,186	33,781	-595	-1.8%
UCT	23,787	24,772	25,301	25,805	26,118	26,357	26,641	-284	-1.1%
CUT	12,205	12,583	12,644	12,724	13,303	14,352	13,149	1,203	9.2%
DUT	24,026	25,184	24,840	24,875	26,059	26,472	26,176	296	1.1%
UFH	10,016	10,741	11,144	12,044	12,315	13,063	12,380	683	5.5%
UFS	27,241	29,901	31,586	32,375	31,877	31,032	34,791	-3,759	-10.8%
UJ	49,315	48,315	50,528	48,769	48,386	49,789	48,890	899	1.8%
UKZN	38,864	41,224	41,762	41,864	44,002	45,465	43,768	1,697	3.9%
UL	16,299	18,205	20,504	22,249	22,914	23,384	22,694	690	3.0%
MUT	9,677	10,033	10,286	10,802	11,375	11,377	10,000	1,377	13.8%
NMMU	25,497	26,119	26,256	26,597	26,361	26,510	27,279	-769	-2.8%
NWU	50,589	55,732	56,641	58,752	60,975	63,135	66,203	-3,068	-4.6%
UP	55,734	57,114	58,128	57,508	57,553	56,376	57,053	-677	-1.2%
RU	7,012	7,169	7,278	7,395	7,485	7,519	7,861	-342	-4.4%
UNISA	263,559	293,437	328,864	336,286	355,240	328,491	361,643	-33,152	-9.2%
SUN	25,693	27,344	27,266	27,510	27,418	28,869	27,738	1,131	4.1%
TUT	52,688	51,785	50,075	51,711	54,159	56,785	55,961	824	1.5%
VUT	19,407	21,416	21,861	21,201	20,633	19,319	19,119	200	1.0%
UNIVEN	11,125	10,679	10,342	10,323	11,818	13,497	12,220	1,277	10.5%
WSU	25,356	26,734	27,029	24,613	24,122	23,946	25,462	-1,516	-6.0%
UWC	16,203	18,059	18,764	19,591	20,383	20,582	20,778	-196	-0.9%
WITS	29,234	29,498	29,004	30,436	31,134	32,721	31,560	1,161	3.7%
UNIZULU	13,291	14,725	15,592	16,434	16,591	16,663	16,600	63	0.4%
UMP						140	240	-100	-41.7%
SPU						124	124	0	-0.2%
TOTAL	837,776	892,936	938,201	953,373	983,698	969,154	1,002,110	-32,956	-3.3%

Source: DHET 2016:7

The above ministerial statement in Table 2.3 highlights the relationship between meeting the enrolment targets and the application processes to be discussed in the next chapter. According to DHET (2016: 37), the Department of Higher Education also acknowledges role of private higher education providers with a contribution of 14.7% to the total headcount in 2015. The issue of funding affects not only access on a larger scale but also how application processes are managed by HEIs.

Public HE has experienced a gradual increase in student enrolments, from 892,936 in 2010 to 969,155 in 2014. Those to both private and public HEIs increased by 1.9% in 2015 (DHET 2015:6), a figure anticipated to increase by 3.5% year on year so by 2030 it should meet the set targets of the National Development Plan South Africa of 150 HEIs, 26 of which would be public and 124 private (DHET 2015:4). In 2010, universities enrolled approximately 950,000 students, while colleges enrolled approximately 300,000. A 30% anticipated increase of student enrolments by 2030 is expected (Matsolo, Ningpuanyeh & Susuman, 2018:3; NPC, 2030:320). Within the framework of this study, this anticipated increase should be considered alongside the embedded and underlying challenges of how the management of admission processes across the HE landscapes occurs, issues to be discussed in detail in chapter three on the complexities of the application processes. The recent HE indicates the growth of the sector based on the 2016 HEMIS information.

Table 2-4: Post School Enrolment data - 2016

	HEIs			Colleges				Total PSET
	Public	Private	Total	TVET	CET	Private	Total	
Number of institutions	26	123	149	50	9	279	338	487
Number of students enrolled	975 837	167 408	1 143 245	705 397	273 431	168 911	1 147 739	2 290 984

Source: DHET:2017:6

The above figure of, 2,290,984 in Table 2.4 includes, according to DHET (2017:18), 69,381 students' foreign student registered in the public sector in 2016, covering 7.1% of total enrolment in HE. In this regard, this study is making an effort to indicate how large the sector is and therefore the implementation of the CAS has to take to account the nature of HE in South Africa.

2.6 Funding Challenges for Higher Education Institutions

The cost of HE is peripheral to a number of difficulties the sector faces (Oreopoulos & Petronijevic, 2013:41). Students' inability to pay fees and increasing perpetual student debts has been the narrative facing the HE sector and as Mouton, Louw and Strydom (2013:291) argue, "at this stage, the most important source of financial support for South Africa's public universities is the government, which has historically provided the core support for institutions' operating and capital expenses." This, however, does not cover some living expenses, and therefore access to the system is still limited (CHE, 2016, Mdepa & Tshiwula, 2012). According Johl *et al.*, (2014: 143), "HE in South Africa is primarily funded by government grants, student fees and income generated from the publication of research articles." In South Africa, the average proportion of

institutional income derived from tax payers has decreased from 54.1 per cent in 2004 to 51 per cent in 2010.”

Oreopoulos, and Petronijevic (2013:41), indicates that prospective students also face financial constraints, including considerations about added debt, which makes decisions to attend school challenging. These authors argue that students make decisions on how much to invest in education based on the anticipated return, so they will take a lower amount, which may not be optimal. These costs also take into account to which institutions students apply, whether they are expensive or less expensive, and thus the amount of loan to take (Oreopoulos & Petronijevic, 2013:41). In addition to the costs, will they receive their return on investment and will they be employed if they indeed do attend that institution or enrol for a particular programme (Dorasamy & Balkaran, 2013:269). Institutions have experienced a plethora of unprecedented protest, some violent in nature. Students registered at various HEIs led a massive protest under the banner of #FeesMustFall# and #Rhodesmustfall#, demanding free education and better conditions in institutions (Leibowitz & Bozalek, 2014:18).

This continuing feature of disruptive and costly student protests due to funding issues and lack of access to public HE will add to the challenges facing the admission of students to universities. Concomitantly, both DUT and UKZN have experienced student protests (Chetty, 2014:95), and provision of an enabling environment to succeed is articulated by Munro *et al.*, (2013:175): “all students accepted into HEI should be provided with access to the resources that may give them a fair chance of succeeding.” HEIs will not be able to accommodate the large numbers of potential students, and it is reasonable to expect that these issues will further affect the efficiency and effectiveness of managing the applications to HEIs. Johl, Von Solms, and Flowerday, (2014:129) indicates that despite the academic ideals, HEIs are faced with delivering more with less in a world that demands increased higher education participation rates. Badat (2016:75) indicates that state funding for students who are academically eligible for admission to universities and meet the criteria of National Student Financial Aid Scheme (NSFAS) is complex.” NSFAS was established by the South African government in 1999 to fund students with financial needs (Mohamedbhai, 2014:71), targeting students from low socio-economic with a combination of loans and bursaries (CHE, 2016:28). The national financial aid (NSFAS) is inadequate to support all deserving students at appropriate levels for undergraduate and postgraduate study. Munro, Quayle, Simpson, and Barnsley (2013:169) indicate food insecurity as another factor that affects HEIs in the country because students admitted are from backgrounds that are diverse. While Caliz and Fourie (2016:5) indicate that some universities, such as Stellenbosch, was researched for white students. Câmpeanu *et al.*, (2017:752) advises that “Higher education institutions today are

in a strong competition for resources, while having to control their costs and improve their efficiency in funding allocation and enrolment process”, therefore funding has major implications for how HEIs operate and is one of the contributing factors to the complexities of the applications processes, which will be discussed in the next chapter.

2.7 Chapter Summary

This chapter provided the historical underpinnings to which access can be navigated in South Africa and examined some of the challenges inherent in the system. These included the legislative framework, the enrolment planning process as well as the funding challenges. These aspects presented in this first chapter of the literature review needed to be contextualised and addressed. The next chapter goes deeper in the application processes, by unpacking the complexities that HEIs deal with as inherent in the application processes.

CHAPTER THREE: COMPLEXITIES OF THE APPLICATION PROCESS

3.1 Introduction

The second chapter of the review will examine application processes across various institutions in South Africa. It will review scholarly work on challenges with the application processes to further highlight the issues that HEIs face and focus on available knowledge regarding the two types of application models, i.e., the centralised and decentralised. An application process is a set of procedures that a prospective student follows in order to be admitted into a programme, qualification or course at an institution. Application procedures differ from one institution to another, and have been found to be complicated and confusing (Zhang & Hagedorn, 2011:11). Several considerations are made before a prospective student can be admitted (Clinedinst & Hawkins, 2011; Palmer *et al.*, 2011), but the basic principles are meeting the selection criteria and having space available in the programme (Clinedinst & Hawkins, 2011:9; Schwarts, 2004:18; Palmer *et al.*, 2011:8). Palmer *et al.*, (2011:1) argue that when it comes to eligibility for admission, the focus is on admission criteria and how the applicant has performed in areas such as additional tests or interviews (Nel & Kistner, 2009:970). As this study examines the efficiency and effectiveness of the application process, and the CAS, the next chapter will link aspects of the efficiency and effectiveness of the applications process with public sector efficiency and effectiveness. However the latter will be detailed in chapter four. The applications methodology is discussed to give an overview of the procedures that unfold.

3.2 Application Methodology

The application processes generally follow the same pattern across the education sector (Clinedinst & Hawkins, 2011: 4-5; Effah & Liu, 2014:2) with prospective student enquires about what they want to study and make a decision to apply. The universities will then evaluate the application and makes admission decision. The above process is normally referred to as the 'application cycle' (Dawson, Heathcote & Poole, 2010:117). The application cycle begins with marketing and recruitment, applications, admission, registration and examination, and ends with graduation. However, because this study is about the application processes it is restricted and as such will not address the enrolment, examination and graduation processes.

3.2.1 Admission policies

Universities define their entry requirements and selection criteria in their various admission policies to determine if a student can be accepted to a programme. Admission policies and procedures ensure a fair and open selection of students without compromising academic standards (Favish & Hendry, 2010; Hourigan, 2011). In an attempt to ensure equal representation in HE, and to fully commit to redressing past injustices, some institutions adopted the admission policies that address national imperatives of equity. In some cases, institutions had to lower their entry criteria to ensure that equal opportunity and access was realised, and in order to address the equity imperatives they amended their respective admission policies (Favish & Hendry, 2010; Gelber, 2011). Hourigan (2011:39) argues that both the admission policies and the entry requirements play a role in meeting the academic objectives at universities.

The application processes across most institutions are similar, although the approach may differ. Clinedinst and Hawkins (2011:18) define selectivity as “the proportion of applicants who are offered admission, and is usually expressed as a percentage.” Institutions have selection tools and criteria that are suited to their aims, will accept students and provide support toward their successful academic outcomes (Hourigan, 2011:39). This is why setting and achieving the enrolment targets has financial implications for HEIs. Table 2.3 illustrated how each institution was performing in relation to over-subscribing and under-subscribing on their respective set targets. The admissions policies need to be documented, accessible, and transparent, support consistent admission decisions, and ensure that HEIs select students who are likely to succeed.

However, most applicants do not meet the entrance criteria as defined by the universities in their various admission policies. In South Africa, students write, amongst others, the NSC and obtain matric endorsements that allow them to access various programmes at universities, be it access to Higher Certificate, National Diploma or Bachelors pass (Nel & Kistner, 2009:954). It should be noted that there are other pathways to gain access to HEIs (Cosser 2011:3), criteria to be included in the admission policies of HEIs. In South Africa HIEs use NSC as a school-leaving certificate that determines admission. Learners only need two languages, Mathematics or Mathematic Literacy, and one designated subject to gain access to university. This means that learners apply to university based on the NSC endorsement. For a pass, a student needs 40% in three subjects, which includes home language, and 30% in three other subjects. As a result, a learner with an average of 35% can obtain a NSC pass endorsement (Nel & Kistner, 2009:954).

Spaull (2013:5) indicates that the NSC pass requirement has been criticised to be of low standard. Institutions then define further admission criteria to inform student admission into programmes, then rank student selection based on merit, i.e., from highest performers to lowest. However, Chetty (2014:89) found that; the poor quality of the mathematics achievement scores of those

black students who gain university admission militates against them securing places in the prestigious science, medical and engineering programs. The large majority are left with few options after high school, since the limited seats are effortlessly filled by middle-class and urban-based students.

Heagney (2012:67) defines merit as “students’ achievement in the end of school examinations in relation to the performance of their peers.” Dealing with high pass rates automatically increases participation rates, as most learners pass their matric. Nevertheless, this presents a challenge as, administratively, universities must process all applications, even though students may not meet specific criteria. HE admission processes are challenging because of the different categories of applicants who apply and each type has to be dealt with in a specific way, requiring processes that are unique to their respective needs (Bahr, 2012:96; Ishitani & McKittrick 2010; Kuh, Kinzie, Schuh & Whitt, 2011). Within the admission policies and processes, provision has to be made to manage the applications of students to undergraduate programmes in HEIs. It is also imperative, as Newman, Couturier and Scurry (2010:4) indicate, that new policies be formulated to address the changing circumstances in HE.

The question of the access to HEIs of classes is not uncommon, including in Russia, where as Ampilogov, Prakhov and Yudkevich (2014:35) note, “wealthier students study in elite universities, while students from less affluent families tend to choose less selective universities.” Student recruitment processes are discussed in section 3.2.1.1 followed by the applications, selection and admissions in 3.2.1.2.

3.2.1.1 Student recruitment process

The student recruitment process is critical for all institutions, with great competition between them. The recruitment aspect of the application processes is highlighted as they inform student trends (Altbach *et al.*, 2009:6; Zhang & Hagedorn, 2011). According to Simões and Soares (2010:2), “the importance of effective and focused student recruitment practices is paramount and such an understanding may greatly enhance HEIs’ marketing policies.” It is also critical that adequate information be available for students to make informed decisions on which institution to choose and the recruitment process should make application easy. If students have the right information they can seamlessly navigate the application processes (Zhang & Hagedorn, 2011:8). Another complexity has been noted around the admission of international students to programmes, hence some countries use admission councillors. A study conducted by Redding (2013:12) found a lack of basic knowledge and understanding of admission processes in the USA by international students.

3.2.1.2 Applications, selection and admissions

Generally, during the admission season, prospective students and their parents queue for some time at various institutions to collect application forms to study at undergraduate level. Another option is for them to download and complete the application form, if they have access to the Internet and a computer. When returning the forms, a similar methodology is followed (Auddy & Mukhopadhyay, 2014; Clinedinst & Hawkins, 2011) but this has to do be carried out for every institution to maximise the opportunity of entering the HE system. Depending on the availability and accessibility of the institution, applicants move from one place to another to find out about the status of their applications, which is costly and ineffective (Auddy & Mukhopadhyay, 2014:36). Each institution has the authority and mandate to make these admission decisions (Bethell & Zabulionis, 2014:26). Feedback by the universities is given to the applicants once the selection process is complete.

Optimisation of efficient and effective services is what the CAS is intended to provide in the sector. Roderick, Coca, and Nagaoka (2011:23) suggest a number of processes in application which are time-bound, such as navigating the institutional choice fit for a particular prospective candidate, applying for financial aid and subsequently submitting an application for consideration. All these require availability of technology that will bring efficiency and effectiveness to the entire application process. In addition, Dunnion O'Donovan (2014:27) argue that applicants need to be provided with services, and information in the easiest and simplest way for them to timeously decide to study at a university. Hence, provision of efficient effective service is central to clients, the students, despite apparent complexities and challenges. The point of contention is whether the CAS will be an enabler of access or a hindrance.

Applications are guided by timelines as, typically, universities operate within specific academic calendar dates which can differ depending on the institution and the course (Mullen, 2011:8). These dates are approved by the university to guide the operations and activities so the institutions have set application closing dates, after which applications are not accepted. Should the university accept a late application a fee will be imposed, determined by each university for the different types of students and the time the applicants submit their applications, irrespective of the method of application, for example, national students will be charged differently from international counterparts (Clinedinst & Hawkins, 2011:28; Schwartz, 2004). In South Africa, applicants will be charged by each institution to which they are applying, with the exception of those in KZN. They will do this through the CAO, which charges a single application fee (Van Staden, 2013). The application fee is non-refundable and paid by prospective students to universities. Chade *et al.*, (2014:974) confirm that the cost of applying through a common or central application service

is more cost-effective than applying to multiple institutions. The following section deals with the challenges and complexities of the application process, and highlights the seeming inefficiencies and the ineffectiveness. To simplify the above scholars, Effah and Liu (2014:2) provide the following outline of the application process in Figure 3.1.

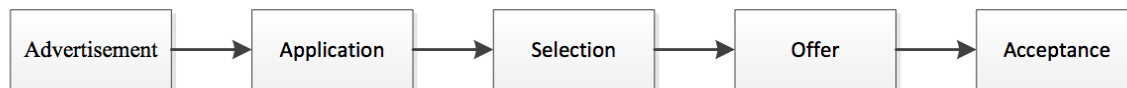


Figure 3-1: Modelling the application methodology

Source: Effah and Liu (2014:2)

The universities are responsible for the recruitment process; they advertise the programs that they offer. Prospective students will apply, if they meet the criteria based on the admissions policies and the targets as discussed in section 2.5 on enrolment planning. Prospective students will be given an offer. The offer will be accepted by the client as indicated in Effah and Liu (2014:2), successively figure 3.1. Students will then be invited to register. The above narrative, however is not without challenges. These are challenges that HE South Africa is calling for the implementation of the PSET-CAS to address some of the challenges which are next discussed.

3.3 Challenges with the Application Processes

As postulated by Simões and Soares (2010:2), HEIs faces complex challenges. This sector is undergoing a major transformation, such as change in the demand patterns for students, as well as global competition amongst institutions. In addition, Favish and Hendry (2010:269) claim that transformation principles require that inequalities be addressed, even though the admission policies take into consideration those that are historically disadvantaged. The challenges mentioned in this literature review are highlighted due to their relevance, but are not limited to those mentioned. Accordingly, Mzangwa (2018:71) argues that “few students who manage to gain access find it difficult to participate up to an acceptable level since they are usually ill-prepared as the result of poor high school education and the less resourced background from which they come.” In this section, the first challenges that is presented is the late applications or *walk ins* which have been subject to discussion in section 3.3.1, 3.3.2 addresses the ICT related literature, followed by scholarly review of the literature on the matric results in 3.3.3, followed by human resources and capacity in 3.3.4, and finally student choices in 3.3.5. The next section of this chapter will discuss two models of the applications processes, namely, the Decentralised Applications System (DAS) in 3.4 followed by the CAS in 3.5. Thus providing further context of the study.

3.3.1 The *walk in* phenomena

One aspects of choosing post-school education is postulated by Castleman and Page (2015:3) who argue “that an important first step in the pursuit of a postsecondary credential is to decide what credential to pursue. Yet incoming students often lack well-defined, pre-established preferences.” They take time to choose the right school (Castleman & Page 2015:4), which may be one of the issues that contribute to the late application phenomena as prospective students need to have made these decisions well in time to meet the application deadlines. If taken early they will gather the information needed to apply.

3.3.2 Information technology

The manual processing of applications has improved at some universities, while others have shifted completely to an online mechanism for applications processing. Council (2014:9) also notes that in addition to paper-based applications, the process of prospective learners can also be held through the use of tailored software such as *UnitE*, an online model. Online capability is one of the components of the application process (Auddy & Mukhopadhyay, 2014:1), and electronic modalities are often needed from recruitment initiatives to enrolment arrangement. Zhang and Hagedorn (2011:8) argue that the effective recruitment of students is central to competition, thus some universities rely on several online platforms that can reach large numbers of students effectively.

Access to the Internet is necessary for an online application process, however, applicants in some countries and regions have limited access to the technology. Nevertheless, the online platforms allow institutions to receive applications on their websites, and for applicants to electronically submit their applications from remote locations without incurring the cost of physically going to the universities. Access to and affordability of the Internet, especially in developing countries, has been discussed in many studies, especially in the context of providing e-learning platforms (Bhuasiri, Xaymoungkhoun, Zo, Rho & Ciganek 2012:855; Chinn & Fairlie 2010:155; Liyanagunawardena, Williams & Adams 2013:33). According to Castleman *et al.*, (2015:17), online services have been used to integrate information about school and requirements for degrees, and to allow the students to track the progress of the application process. Thinyane (2010:412) suggests that South Africa, as a developing country, has a potential applicant base different from developed countries as most applicants come from disadvantaged backgrounds and fewer come from privileged backgrounds. The former are often only introduced to Information and Computer Technology (ICT) for the first time at university. Cultural backgrounds, experience and exposure are also unique, depending on background. A study conducted by Warschauer and

Matuchniak (2010:185) indicates that Americans without Internet access at home can use their library or community centre, and 61.7% of US households have none. In South Africa, Internet access, selection criteria and funding resources may influence an applicant's choice of HEIs.

Both DUT and UKZN use an ERP named integrated tertiary software (ITS). On the other hand, the CAO uses their own operating system which is different from ITS. Synchronisation of different systems and methodologies needs to be taken into consideration when dealing with efficiency and effectiveness of the CAS. As Castleman, Schwartz, and Baum (2015:16) argue, "technological innovations could improve students' access and navigation of information about programs, courses, requirements, and prerequisites." The CAS needs to ensure provide the technology that facilitates and does not hinder efficient and effective access to post school education. If this does not happen, HE will be subjected to lack of efficiency and effectiveness in managing the application process. Service delivery will be negatively affected and disasters will continue to occur.

Information Communication Technology (ICT) is therefore critical to the provision of efficient and effective services in Higher Education. Institutions have implemented different Enterprise Resource Planning (ERP) systems to meet their respective operational objectives and business objectives, for example, integration of student services, human resources planning, and customer relations management (Olugbara, Kalema & Kekwaletswe, 2014:65). It is therefore apparent that the CAS must include a number of components, for example, process-related, ICT, and other resources, that allow for the efficient and effective provision of the application process (Damanpour & Aravind, 2011:425; Clinedinst, 2008:11). This is postulated by Mahundu (2016:8), whose study found that the Tanzanian CAS should be integrated with other systems that serve the same clients including loan application system, a critical learning platform on the implementation of such a system for HEI.

3.3.3 Matric results

Matric results are used to determine admission or non-admission to qualifications (Clinedinst & Hawkins 2011:6; Nel & Kistner 2009:954; Rankin *et al.*, 2012;12; Palmer *et al.*, 2011:4). For Van der Berg and Shepherd (2010:3) "matriculation results determine options for university entry, bursaries, career choice, and labour market prospects". Students have to pass grade 12 in order to be allowed to enrol at any university (McGhie, 2017:408). Institutions may use final results or the current ones, depending on the applicant's category, i.e., if he or she has completed matric or is currently in his/her matric year. Palmer *et al.*, (2011:12) argue that the benefits of using final year secondary school results are efficiency and transparency, because the student has already achieved

the particular outcome. It should, however, be noted that this study is not about whether or not the particular type of result informs success, rather, it is about acknowledging that the challenges associated with the results, particularly the selection criteria, may hinder the smooth processing of applications, as the above considerations could create delays in the system. If applicants understood and interpret the admissions requirements they would not need to contact the CAO or the university and if they did not meet the criteria the number of enquiries would decrease, making the process more efficient.

The issues with the matric results are further indicated by Mouton, Louw & Strydom, (2013:287), such that due to the standardisation process, Umalusi corrects problems of the matric results later, thus making it difficult for candidates' achievements to be determined. Umalusi is the Council for quality assurance in general and further education and training in South Africa. The NSC outcomes are the subject of many studies regarding the outcomes of the school leaving certificate, and whether or not they are a good indicator of preparedness for HE (Mouton *et al.*, 2013:287). According to Fisher and Scott (2011:11), in 2009 an increased number of students who wrote the National Senior Certificate (NSC) for the first time met the minimum statutory criteria to access a bachelor's degree, a diploma or a certificate programme, yet not all could be enrolled because HEIs have different articulation to admission from the NSC endorsement. Managing university admissions and selections while having to promote equity and increase access and participation are some of the challenges that are confronting HEIs. These challenges may be acute, however, they do contribute to how universities deal with their admission processes, which is especially difficult when the number of applications are far higher than the available spaces (Palmer, Bexley & James, 2011:5). Richardson (2008:382) argues that from the students' perspective, obtaining a post-school qualification translates into income, i.e., they seek access to HE in order to secure their futures. However, access to tertiary education is controlled by a complex application process.

The NSC is one contributor to the ineffective and inefficient management of applications. Notably, Nel and Kistner (2009:958) emphasise that "great uncertainty exists throughout the country regarding the standard of this final examination, and therefore to depend solely" on the NSC is not a good assessment practice. Many students who enter HE are not prepared for the challenging environment, which leads to high dropout rates (Nel & Kistner 2009:956). While the NSC remains the main admission tool for most South African institutions, other countries use additional instruments such as interviews, entrance examinations and auditions (Heagney 2012:67). Central to an admission policy is the need for students to complete their undergraduate studies and acquire the sought-after qualifications. That most do not meet the entry requirements influences how effective or efficient HEIs are during the admission period.

In the USA, in addition to final school leaving results, students have to take an aptitude test known as the Standard Assessment Tests (SATs), to determine the potential to succeed and level of preparedness (Heagney, 2012:67), whilst in Russia, students sit a unified state examination (USE) to determine admission to universities (Ampilogov *et al.*, 2014:35). In South Africa, some institutions consider a national benchmarking test (NBT) to inform admission, taken by applicants and having an academic literacy proficiencies component (Cliff, 2015:2). While acknowledging the importance of students being prepared for various qualifications, it is not the focus of this study, but rather it is focused on how the admission imperatives influence the efficiency and effectiveness of the application processes to access HE, and the challenges that application processing presents to the administrative operations at universities.

3.3.4 Human resources and capacity

Institutions have to employ additional staff to capture application details, provide feedback to applicants, ensure that the information is accurate, and produce reports on all these activities (Auddy & Mukhopadhyay, 2014:14). Universities do not have the necessary resources to accommodate and support the students academically, and therefore HEIs are forced to limit the number of admissions (Bhengu *et al.*, 2006). The way in which different institutions deal with these admission challenges varies, particularly when demand exceeds supply (Dunne *et al.*, 2014:1667, King & Ahrens 2013). This emphasis indicates that because of historical background the current admission challenges may not necessarily be resolved by the redesign of the application process alone. Restriction on numbers can also influence the applications process, these are previously discussed in the forgoing chapter on enrolment planning, which is section 2.5. The choice of HEIs are next discussed.

3.3.5 Choice of Higher Education Institutions

An applicant has to make a decision to enrol at a particular HEI, which can be informed by various things, including the type of university and if it offers what he or she desires (Chade, Lewis & Smith 2015:977; Clinedinst & Hawkins, 2011:28, Sojkin *et al.*, 2014). HEIs must ensure that their yield rate, which is a percentage of those admitted and converted to students, meets the set enrolment targets (Chade *et al.*, 2015:974; Clinedinst & Hawkins, 2011:28). Importantly, Klasik (2012:4) found that applicant aspiration may not necessarily result in enrolment, i.e., a prospect may show interest but not end up registering with that institution. Altbach *et al.*, (2009:14) argue that HE has become a competitive enterprise in the 21st century, as students have to compete for limited places in universities. Just as institutions can make selection of who to admit, so a prospective student can choose to enrol at a particular institution (Arthur & Yamoah, 2016;

Walsh, Moorhouse, Dunnett & Barry, 2015), and do so by choosing institutions that have a high ranking (Hazelkorn, 2015).

As issues regarding efficiency and effectiveness of application processes are of continuing concern. Interactive challenges deepen complexities of application processing. Broadly the components discussed are common to the distinctive application process models, Decentralised Applications Systems (DAS) and the CAS. These two models indicate that application methodologies differ, building knowledge about the different systems that can be used for management of the application for HEIs and are discussed next.

3.4 Decentralised Application System

Heagney (2012:67) defines the ‘decentralised system’ as an “admissions system with students applying directly to institutions who set their own criteria for entrance.” It should be noted that some scholars believe that the DAS is a better system than the CAS, for example, Bethell and Zabulionis (2014:26) found that the Universities and Colleges Admissions Service (UCAS) in the United Kingdom, which is a centralised system was not advantageous for students as it went against fair and effective principles. The authors argue that it was no longer relevant in today’s approach to admissions processing, as it was inefficient for applicants, and no longer fit for the purpose. Application choices were restricted and dictated to applicants that if, for example, they had applied to the University of Cambridge they could not apply to Oxford (Bethell & Zabulionis, 2014:27).

Another disadvantage is that the centralised model runs a parallel process, whereby the applicants still need to wait for the universities to make their selections. Bethell and Zabulionis (2014:28) note that UCAS makes offers on provisional or predicted results, but when the final results come out and the applicants do not meet the criteria, universities have to revoke these offers. This negatively affects both the universities and the students as applicants might otherwise have accepted offers at different ones whilst the university would be expecting the prospective student to enrol. It should also be emphasised at this stage that centralisation occurs within the universities themselves, where certain departments, for instance, enrolment services departments or admissions and registration departments, run the applications on behalf of the university (Bontrager & Hossler, 2014; Cejda, 2011; Lauren, 2008). This research focuses on the centralisation of applications at a national level, whereas the decentralisation will be referenced to an institutional based model, by which institutions manage their own applications processing. The CAS is envisaged for the national context in South Africa and one of the issues driving this study is to test CAS operations at universities to help inform national policy decision makers.

3.5 Centralised Applications System

A CAS channels application for an institution through one single point of entry (Bethell & Zabulionis, 2014:26), with submission and processing carried out by this central organisation, before the information is disseminated to the various institutions for admission decisions. This method has been deemed beneficial and cost-effective for both universities and applicants, as it is believed to provide the latter with equal opportunities for placement. The information regarding applications is also available and reliable because it is received from one source (DoE, 2002; Palmer *et al.*, 2011). According to Norton (2012:32), the CAS allows an applicant to submit one application to multiple HEIs for several programme choices, and is used in countries around the world. Auddy and Mukhopadhyay (2014:26) argue that the “centralised online admission system is a major reform initiative in the education sector to bring about greater transparency, efficiency and accountability in the complicated and time-consuming admission process”. The CAS is intended to assist HEIs to deal effectively with their selection and admission processes.

Clark and Brown (1998:83) investigated the feelings and attitudes of users of the CAS application process, one of the objectives being to obtain feedback from users about its effectiveness. The survey asked participants about the procedure, and if it was fair, unfair, or user-friendly. Positive attitudes were recorded for issues such as straightforwardness, but the findings also indicated that the process may be slow and complicated (Clark & Brown, 1998:84). The CAS has been used in other countries to assist institutions with the management of the application process, and users in some Indian universities, for example, have found that a centralised admission process for undergraduate courses is a major reform that has brought about efficiency, transparency and accountability (Auddy, & Mukhopadhyay, 2014:26). Due to time limitations and the scope of this study, a brief literature review was conducted for some countries about the various application processes, not only to broaden the understanding but also to find comparative insights and knowledge about how the CAS operates in other countries.

The following sections examine processes in various countries. In an attempt to deepen the knowledge on the CAS model for application management.

3.5.1 Central Applications System - Australia

In Australia, the universities process applications through centralised admissions agencies, with common admissions centres for tertiary institutions. A centralised application service benefits students and universities as the application process is more transparent, uniform and streamlined. (James *et al.*, 2009:9; Palmer *et al.*, 2011:5). In the state of Victoria, James, Bexley and Shearer (2009:10) notes that the Victorian Tertiary Admissions Centre (VTAC)

administers the applications to colleges and the independent tertiary colleges. Institutions themselves fund the centralisation of the tertiary application process, a system that reserves the institutions' autonomy in selection decisions, and each university maintains its admission policies. A benefit of this process is that students do not send multiple applications to all institutions (James *et al.*, 2009:9) and the model has been preferred to such an extent that should universities decide to change to institution-based processes there may be negative consequences, such as increased costs of labour, as well as complexities associated with the application process.

3.5.2 Central Admission System Kenya and Tanzanian experience

In Mohamedbhai (2014:70) it is indicated that in Kenya the selection of admission to all public universities is conducted centrally, although little information is provided on the mode. It would indeed be beneficial to read more literature on the way public institutions in Kenya use the central system. The mode of admission in Tanzania however is articulated in Mahundu (2016:3) in 2010, the Tanzania Commission for Universities in collaboration with the National Council for Technical Education (NACTE) and HEIs instituted the centralised model for their admission to institutions, however, participation in this CAS was not compulsory. Mahundu (2016:3) indicates that CAS is an “electronic system whose functions are to register applicants, validate their applications; select them based on their choices and set criteria for admissions into higher education institutions.” This was a way of ensuring fair and transparent admission to the sector. In next section, the UK methodology of the CAS is discussed.

3.5.3 Central Applications System - United Kingdom

The UK's centralised system, referred to as the Universities and Colleges Admissions Service (UCAS), has set a trend amongst central applications systems. According to Mullen (2011:6), it is the largest central admissions service for HE in the world, processing over two million applications for undergraduate courses annually. As indicated by Dunne, King and Ahrens (2014:7), each student applying for admission to a UK university must submit the application forms and their supporting documents to UCAS during the final year of his/her schooling. UCAS allows for a single applicant to apply for five different programmes at as many universities (Barham, 2011:55). The next section provides much needed background on the CAS in the South African context.

3.5.4 Central Applications System - South Africa

In South Africa, the CAS will be run through the Central Application Service, and will be fully operational in 2019 (DHET 2016). A Central Application Service working group was established

in 2001 by then Minister of Education, Professor Kader Asmal in accordance with the provisions of the National Plan for HE released in March 2001 (DoE, 2001) as shown in Table 3.1. The purpose of the working group was to advise Asmal on the establishment of the National Higher Education Information and Application Service (NHEIAS) as indicated in the White Paper 3 on Higher Education (DoE, 1997). The South African government has made many recommendations on how the CAS should operate and the services that will be offered to the prospective students. Mahundu (2016:3) indicates that “fair admission system is one that provides equal opportunity for all individuals, regardless of their background, to gain admission to a course suited to their ability and aspirations.” The central question is whether the PSET-CAS will provide these benefits to the application and admission processes.

In addition to bringing about efficiency and effectiveness, the CAS will also assist the DHET with planning for the supply and demand for post-school education, intended to handle all applications for both categories of applicants (DHET, 2016:17), that is, those who apply on time and those who walk in. The specific target market is all those entering undergraduate programmes, including adults, grade 11 and 12 learners nationally, and international students (DHET, 2016:17). The generic high-level model depicted in Figure 3.2 indicates how the DHET envisages the Central Application Service will operate at the national level. In Table 3.1, the services that are to be provided are shown in the first column and the action involved stated in the second column.

Table 3-1: Services to be provided by the Central Applications Service

SERVICES	ACTIONS
Promotion	“Apply Now” targeted activations, promoting advice on courses and opportunities available in the PSET system
Advice	Support for career and education advice
SERVICES	ACTIONS
Applications	Receive and submit applications for all institutions in South Africa
Communicate	Communicate with applicants and institutions/partners
Referrals	Refer applicants who are unsuccessful to other institutions/opportunities; clearing house POPI compliance – applicants must give limited permission; and career counselling.

Source: Post-School Education and Training Central Application Service Enterprise Architecture (DHET 2016:12)

Table 3.1 outlines the services that the Central Application Service will offer, while the Figure 3.2 provides a framework that supports the CAS functionality according to how it is envisaged to operate in South Africa. The system is intended not only for academic applications to HEIs but also for the entire post-education system so the CAS has to operate in the current dispensation. Such considerations are extremely important as they may impact on the efficiency and effectiveness of both the CAS as an adopted system for applications in HE South Africa. The process of financial support through NSFAS is also included in the framework. Klasik (2012:30)

indicates that applying for financial aid plays a positive and important role in completing the application steps as it informs the possibility of enrolment.

The high level Central Application Service process is set forth below in Figure 3.2.

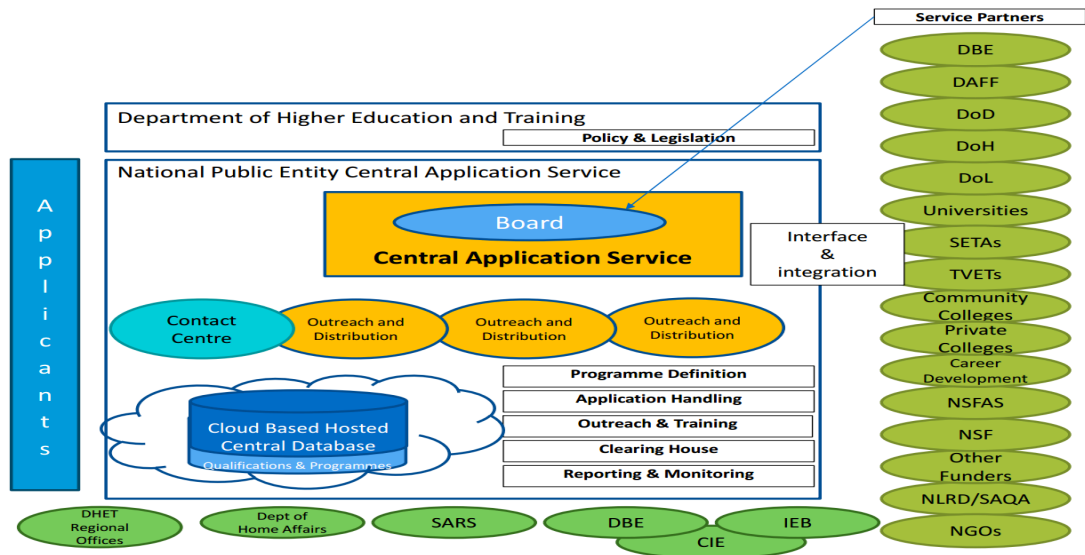


Figure 3-2: Central Application Service Model envisaged in South Africa

Source: Post-School Education and Training Central Application Service Enterprise Architecture (Chapter Two - Service Model February 2016:14)

In South Africa, the CAS through the proposed PSET-CAS is intended to support the effective placement of students, thus supporting efficiency in the application processes (DHET, 2016:14). As Figure 3.2 reveals, the DHET envisages a high level operating model that includes NSFAS. The NSFAS application processes are critical in that the dynamics in South Africa include the inability of many students to pay their fees. Even though the HEIs are self-regulating and autonomous in their admissions decisions and processes, as public institutions, they are accountable to government (Mullen, 2011:8). As a result, the government has to ensure that their policies support the effective running of institutions in response to the needs of society (Capano, 2011:1622) and participation in the CAS will be compulsory (DHET, 2016:14). The implementation of the CAS is of concern, especially when the issue of institutional autonomy arises vis-a-vi the involvement of government in HEI management. This is emphasised by Flowerday, Johl and Von Solms (2014:129), who argues that the “HE environment is highly complex and direct management by governments is no longer appropriate.” This however is juxtaposed to accountability of HEI because of public funding and in South Africa this constituted 19.2% of the total government spending in 2010 (Flowerday *et al.*, 2014:129). Figure 3.3 depicts

how the DHET envisages the CAS operations will incorporate all the necessary steps, from policy to reporting, monitoring and evaluation.

The overall operating model contains the following main steps:

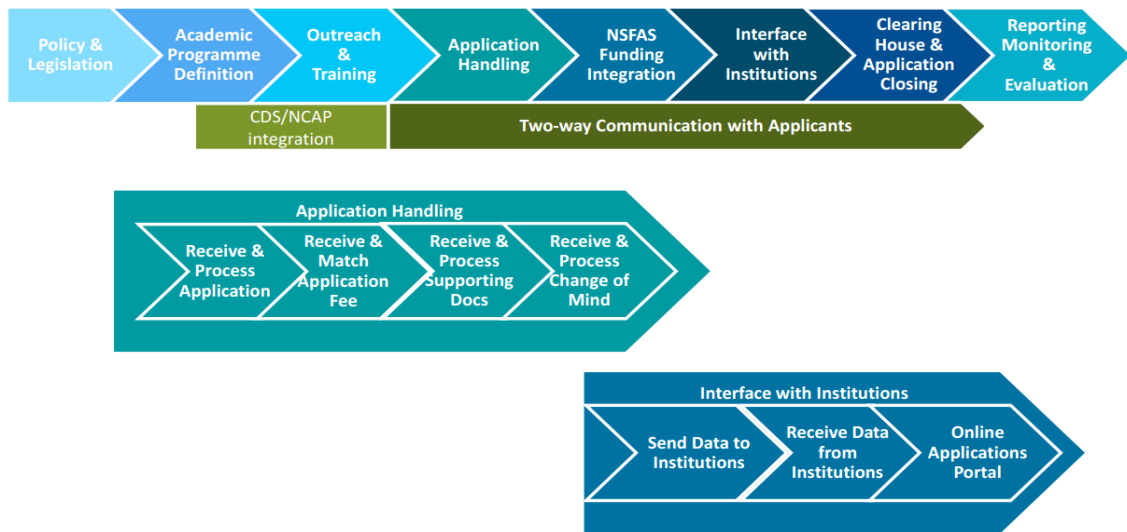


Figure 3-3: CAS operating model

Source: Post-School Education and Training Central Application Service Enterprise Architecture (Chapter Two - Service Model February 2016:8)

As stated in the previous paragraph, although the CAS is meant for all South African post-school institutions, this study will look at the efficiency and effectiveness of the CAS through the CAO, which only provides the model for KZN institutions.

3.6 Central Applications System - Kwa-Zulu Natal

The CAO processes applications for first-time admission to universities in KZN province (CAO 2018:3) as a non-profit organisation that was established in 1998. One of its benefits is the creation of an environment in which applications can receive information at a central point with a single application fee. This single point model has been identified as an effective application process that is suitable to operate at national level, and should benefit both prospective students and institutions (Van Staden, 2013:3). The CAO processes applications for the universities, TVET Colleges as well as private colleges in KZN. The intention of the DHET is to have the CAS process all applications for first-time entering students and all undergraduate applications to all three entities of post-school education (DHET, 2016:7). Currently, the Durban University of Technology, University of KwaZulu-Natal, University of Zululand, Mangosuthu University of Technology, TVET and private colleges in KZN are using the CAO. In 2008, UNISA announced

that the CAO in KZN would process all its applications nationally because the 17,000 applications at the time took excessive time and delayed other work. They since abandoned this mode and decided that the applications would be routed to UNISA directly. It may be worth investigating the reasons for the decision not to continue with the CAO model adopted to the direct university application model, to contribute to future studies on the use of the CAS for application processing.

3.7 Chapter Summary

This chapter highlighted the literature review on the application processes and its complexities confronting the Higher education sector. It also explored how the CAS phenomenon is experienced in other countries. An illustration of the two application process models, centralised and decentralised, were outlined and juxtaposed. The chapter also provided an overview of the CAS in the South African Context. Which concluded this second chapter.

CHAPTER FOUR: OPERATIONALISING PUBLIC ADMINISTRATION THEORIES AND CONCEPTS

4.1 Introduction

This study is set out to achieve a number of objectives as outlined in the introductory chapter, section 1.4. Whilst the first two literature review chapters were foundational to understanding access to higher education in South Africa and complexities of the application process, this provides critical background in the evolution of public administration theories. It goes on to discuss public administration theories and concepts foundational to the study before introducing the meta-theoretical framework that guided the study.

4.2 Public Administration Theoretical Underpinnings

Hughes (2012:1) proposes that the emergence of new paradigms challenge the fundamental principles of traditional public administration. Traditional public administration has been discredited (both theoretically and practically) hence the adoption of new forms of public management in the public sector. The first of these was that of bureaucracy which asserts that governments should organise themselves according to hierarchical bureaucratic principles. This theory is clearly enunciated in the classic analysis of bureaucracy by the German sociologist Max Weber (Hughes 2012:1). Hughes (2012:4) further denotes that a more pragmatic approach to public management became a necessity as this bureaucratic need to involve the comparison of theories, neither of which work perfectly.

The paradigm shift is a direct response to problems with previous public management reforms. Amongst other prominent theories that are worth referring to here are; Frederic Taylor's scientific management or Taylorism that arose during the 1920's and 1930s', Elton Mayo's human relations ideas known from the 1930's (Hughes 2012:27; Witzel & Warner 2015:63). These theories were found useful in a variety of disciplines including management, public management, business administration and public administration. Taylor's scientific management was firmly grounded in Engineering and Physical Science wherein the body of thinking was about the best and more appropriate ways of managing organisations in order to ensure that they achieve their goals. According to Witzel & Warner (2015:62), Taylor's scientific management theory took a low-level automatic approach by breaking down tasks into their components parts set out to reducing the complexity of managing work. Elton Mayo's human relations ideas revolved around self-actualisation, job enrichment and the need to discourage conflict in the public sector (Hughes

2012:30). Both Taylor and Mayo continued to influence management systems in the public sector (Hughes 2012:30). Another useful theory in this regard is that of Waldo. Although Waldo's constructions are of westernised origin, they could be reshaped to suit the South African context when it comes to government's oversight of the PSAT-CAS (Frederickson, Smith, Larimer, and Licari, 2015:174; Grimmelikhuijsen, Jilke, Olsen & Tummers (2017:47), in their support of this theory, postulate that "Simon acknowledged the importance of understanding human behaviour in public administration." In that human behaviour is a key component in public management systems that should not be ignored.

For the current study this means that the fact-value dichotomy in decision making has to be interrogated and considered. To be more specific, for the PSET-CAS it means a more community based approach that has to encourage dialogue. For Snider, (1998:274), Mary Parker Follet is yet another theorist, who influenced public administration. Mary Parker Follett (Snider, 1998:274), a public administration theorist concerned with 'what works under the circumstances', asserts in her epistemology that "the law of the situation was continually evolving". Situations are never fixed, knowledge in the sense of experience increases to the extent that increased relation and interpenetration occurs. Her widely accepted ideas on leadership, group processes and participation have been constantly reviewed and analysed (Snider 1998:274). This suggests a concern with pragmatism, and as a result her ideas could be useful to this study since the CAS is a newly constructed phenomenon wherein knowledge about the system is still evolving.

The beginning of the 1990s also saw a new model of public sector management which was known by several names including 'managerialism' (Hughes 2012:4; Hyndman and Lapsley 2016:386; Roness 2017:4). Notably, this was a period of rapid changes in the public management sector. The name New Public Management (NPM) seems to resonate (Hughes 2012:4). For Hyndman and Lapsley (2016:385) NPM "is a phenomenon which has been widely observed and debated since the seminal contribution of Hood's observations (1991 and 1995)." It advocates for a regulatory policy framework in improving by fostering completion, improving regulatory policy, performance and efficiency (Hyndman & Lapsley 2016:385). NPM explicitly resolved around the tackling of ineffectiveness in the system by using performance indicators and market mechanisms which are designed to improve bureaucracy by subjecting market incentives (Hughes, 2012:27; Roness 2017:4). Hyndman & Lapsley (2016:386) provide the following components of NPM in Figure 4.1 below.



Figure 4-1: Hood’s Components of NPM

Source: Hyndman & Lapsley (2016:386).

NPM was also criticised by among others by Alberto Guerreiro Ramos, who believes that NPM is conceiving of humans as narrow, economic-reckoning creatures (Salm, Candler, & Ventris, 2006:533). Roness (2017:4) notes that some academics emphasised on inconsistency in some elements of NPM as a ‘hybrid, and found that in most countries the general impression remained that many reform initiatives were based on the principle of streamlining hybrid or single-purpose organizations were implemented (2017:33).” Despite the critics, “NPM practices were considered to enhance efficiency and effectiveness as they have both explanatory and predictive capabilities according to Hyndman & Lapsley (2016:388). The strands of NPM was the stress on private sector management styles Hyndman & Lapsley (2016:386). For Haynes (2015:17) however, “the limitations of New Public Management an alternative discourse of government administration began to develop referred to as Governance, Policy Networks.” The South African HE is modelled differently. Even though HE is in the public sector it is challenged immensely as detailed in Chapter Two. This therefore means that approaches aimed at bringing about efficiency and effectiveness for the PSET-CAS have to take cognisance of the political sphere affecting the sector.

As public administration and management came to be included, along with public policy and public affairs, under a broader conceptualisation of public governance, the theory of New Public Governance (NPG) emerged. Hughes (2012:76) distinguishes between government and

governance and argues that whereas, “government is the institution itself, governance is a broader concept describing forms of governing which are not necessarily in the hands of the formal government.” Components of governance will be elaborated on in detail in Section 4.4 below. Scholars eventually focused on theories and concepts of governance that turn away from the top-down command control aspects of bureaucracies and varied dichotomies that impeded decision-making. Rather, theories and concepts that involve characteristics of systems and networks became the focus. Systems thinking and network governance and network management are discussed next.

4.3 Systems Thinking to Address Complex Public Sector Challenges

Haynes (2015:21) indicates that systems theory has influenced management and organisational theory and as a macro approach, which uses both synthesis and analysis in acknowledging the contingencies and the contextual nature of managing the in the public sector. A universally accepted definition for systems theory does not exist (Whitney, Bradley, Baugh, & Jr 2015:20; Williams, Kennedy, Philipp, & Whiteman, 2017:2) and therefore a number of definitions, operating principles and components emerge in this approach. Luppicini (2005:108) defines a system as “the sum total of parts interrelated within one another and the whole structure or organization.” In, Merali & Allen (2011:1) a system is defined as an integrated whole made up of interconnected parts. In systems thinking approach managers have emerged as people who looked for ways of making sense of their interactions with the world and on how it works. These are the epistemological and ontological underpinnings of systems thinking. According to Luppicini (2005:108) systems approach is then a logical process or complex strategy to identify needs, analyse problems and possible solutions, or design procedures to improve systems operations and eliminate needs.” The systems approach which linked business processes and using re-engineering and lean system based approaches in both public and Non-Government Organisations and complex system (Chettiparamb 2016:195; Haynes 2015:22), that gives consideration to feedback between systems and individuals (Chettiparamb 2016:195; Haynes 2015:22).

Williams, Kennedy, Philipp, & Whiteman, (2017: 3) postulate that system thinking is a way of understanding the complexity of economic, social and ecological systems. For Whitney *et al.*, (2015:20) a system is an interacting set of elements conserving a set of relations among them, which work together toward some common objective or purpose. Arnold and Wade (2015: 675) state that systems thinking can also be defined in terms of its purpose. Haynes (2015:18) argues that the “whole systems approaches capture the need for a wide view of policy that embraces much more than the operational system of inputs and outputs”. Williams *et al.*, (2017:2) indicate

that numerous management scholars have long recognized that the complexity of highly interdependent systems necessitates a systems approach, viewing social systems nested within natural systems and recognises the dependency of business. Arnold and Wade (2015: 675) however propose a new definition which is “to define systems thinking as a system by identifying its goal and then elaborating upon both its elements and the interconnections between these elements.” For Luppicini (2005:108) change was eminent when experts questioned the boundaries and changing conditions, and if it was at all possible to arrive at lasting truths in the world. Then organisations were viewed as a total sum of parts interrelated within one structure, human networks and organisations.

Whitney *et al.*, (2015:20) argue that the real world system serves as the source for empirical results by which systems theory principles have propagated from various disciplines, as systems theory lies at the intersection of thought generated from well defined, inherently multidisciplinary propositions described by distinguished authors of varying disciplines”. The aspects of the system approach are that understanding the behaviour increases competence and thus improves decision making and competency of systems. All levels in a network must respect and understand the objective/s of on other. Law makers, policy implementers all actors as this is a multidisciplinary approach to achieving goals. The emphasis is on information, operation, of the axiom(system) in achieving the outcomes. This process is inductive in nature and makes us the systems theory (Whitney *et al.*, 2015: 19-22). The authors present this model in this inter or multidiscipline approach to solving problem in a complex system see Figure 4.2 below.



Figure 4-2: Systems theory axiomatic proponents
Source: (Whitney *et al.*, 2015:30)

These multiple paths from different initial conditions that result in the same output or outcomes for a complex system imply there is no single best solution to a complex problem, and that different solutions, conditions, values, circumstances may produce different results (Whitney *et al.*, 2015:27). For Best & Holmes (2010: 151) systems thinking calls for a different kind of evidence and knowledge, and by extension, calls for a different kind of leadership. In Best and Holmes (2010:152), Provan *et al.*, (2007: 482) takes the “multilevel view further by looking at the interconnectedness of networks, defined as a group of three or more organisations connected in ways that facilitate achievement of a common goal. The authors in addition provide a collaborative model of addressing complex problems in the public sector (see Figure 4.3 below).

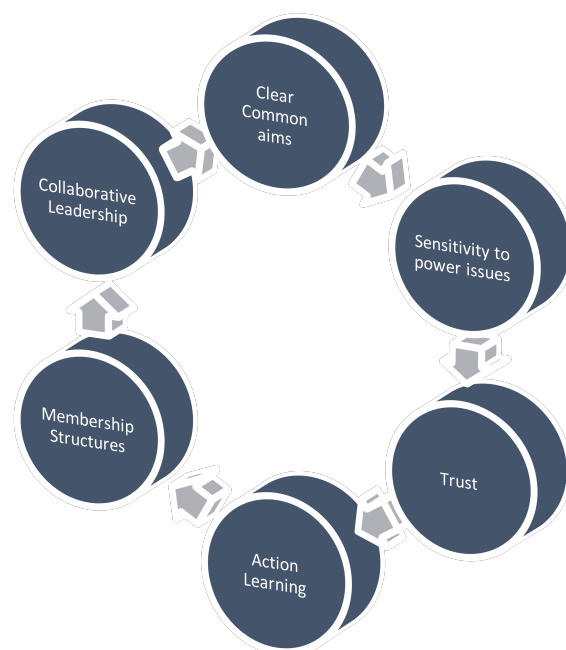


Figure 4-3: Advancing collaborative advantage in a network model
Source: (Best & Holmes 2010:153)

For these authors, a collaborative approach puts emphasis on leadership change and as such they advise that a different leadership is required just as much as new knowledge and evidence to resolve complex issues in systems thinking (Best & Holmes 2010:151). In the context of HE, according to Johl *et al.*, (2014:129) the concept systems theory includes inputs, processes and outputs and as such represents the transformation process. The challenges in the HE sector depicted in Chapter two are precisely why there needs to be holistic approaches to addressing issues affective service delivery in the sector. Johl *et al.*, (2014:129) argue that the HE system in South Africa is viewed as an open system that is governed by the Higher Education Act (Higher

Education Act, 1997) wherein the Act defines the cooperative nature of governance requirements, both within institutions and between institutions; thus, from an epistemological viewpoint they embrace a systems theory wherein cooperative governance within institutions is managed. The authors present the model below in Figure 4.4 to depict the relations in public HE sector.

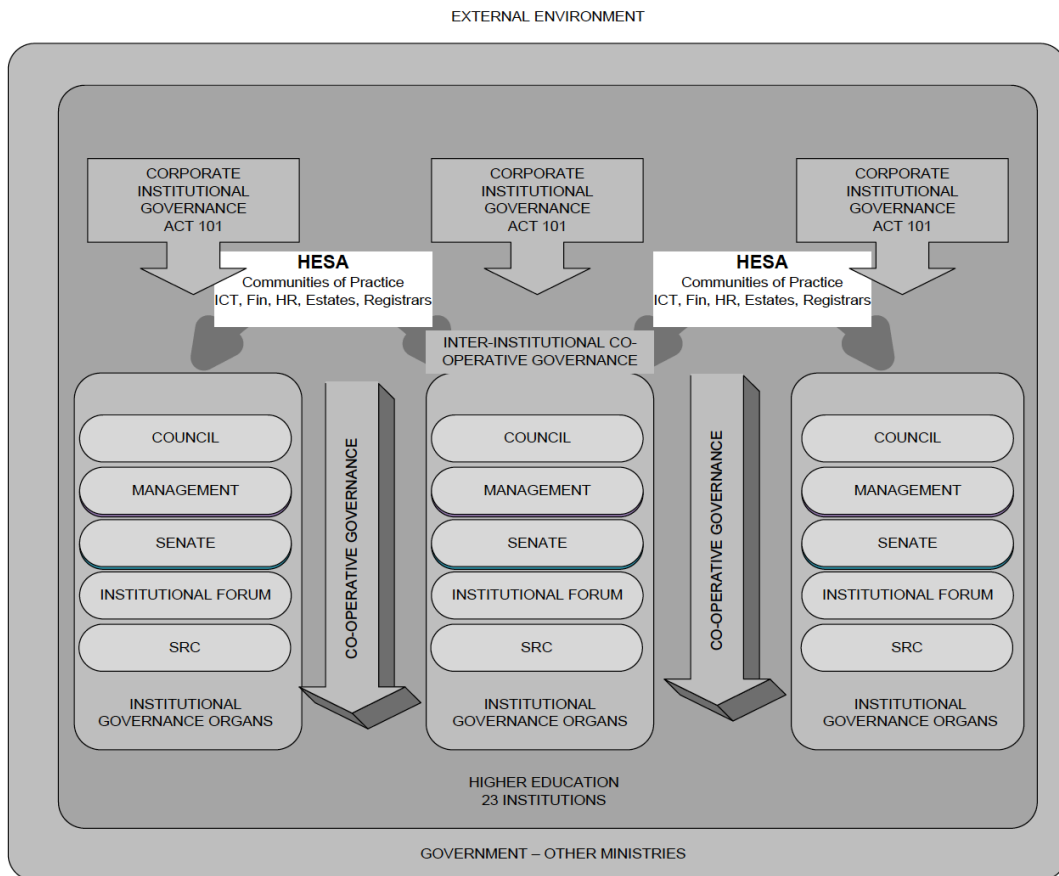


Figure 4-4: Higher Education sector, an open system frame-work

Source: Johl *et al.*, (2014:129)

High Education in South Africa is as an open system consisting of individual HE organisations (i.e. the components or subsystems of the HE system) embedded in an environment that includes the social, political and economic conditions under which the HE organisations need to operate. The environment (political or economically) to which the sector operates influences the system (Johl *et al.*, 2015:132). Inputs in the form of students, faculty, finances and other resources and outputs can be the form of graduates, research, results and advice (Johl *et al.*, 2014:132). For HE, Johl *et al.*, 2014:132, “collaboration between institutions as subsystems can also play a vital role in the governance objectives of the HE system.” Internally and externally. Network management and network governance is discussed next.

4.4 Network Management and Network Governance

According to Opolski, Modzelewski & Kocia (2013: 100) even though the development of the concept of a network is relatively new, the suitable organisation of public administration has been studied by researchers for centuries. This idea evolved from socio-metrics and social anthropology wherein the structure of society was presented as a complex relation between collective and individual actors. Klijn & Koppenjan (2012:594) postulates that in the context of network theory, the terms that are now for policy networks and network management are governance networks and network governance instead. Whereas governance may express different meanings, within the network literature, the authors, Klijn & Koppenjan (2012:594) refer to governance as “the horizontal interactions by which various levels of government coordinate their interdependencies in order to realise public policies and delivery of public services.

A consistent view in Koppenjan, & Klijn, (2015:7) is that governance “tends to emphasise the horizontal relationships between governmental organisations and other organisations”. Governance is also used to refer to strategies of governments and non-governmental organisations aimed at mediating and facilitating the network process which is network management (Klijn & Koppenjan 2012:594). In addition, “governance is a self-regulation of actors within networks (Klijn & Koppenjan 2012:594; O’Toole 2015:362). For Opolski *et al.*, (2013:100) “governance networks are those which link actors – institutional or individual – who are responsible for formulation of law that public administration puts into effect.” According to Opolski (2013:100) governance network can be extensive and includes lobby groups, non-organisations research organisation, governmental law-prescribing and law-making bodies, non-governmental organisations, research organisations and lobby groups. For Best & Holmes (2010:152) at inter-organisational level, and finally for Van de Walle, & Groeneveld (2011:5) however, in order to achieve wanted outcomes the collaboration include private partners in the network to discourages the silos mentality. While Klijn & Koppenjan (2012:592) argue that these networks cut across different layers of government, and include semi-private actors. The authors, Koppenjan & Klijn, (2015:27) provide the following definition of the two constructs - “Governance network processes are all the interaction processes within governance networks addressing a specific problem, policy, programme, or public service. These are conscious attempts or strategies of actors within governance networks aimed at influencing interaction processes. Put in a different way, network

governance applies to linkages in law-setting bodies of the country, these actors may be institutional or individual, inter-units that are responsible for putting laws to effect.

Networks can also be horizontally or vertically depending on other networks or bodies have been delegated with the power to act (Best & Holmes 2010:152; Haynes 2015:17). Caution should be exercised as this dependency may cloud their judgement is driving solutions forward. In addition, problems may arise when there are significant differences in the availability of resources between institutions (Opolski *et al.*, (2013:100). Koppenjan & Klijn (2015:2) argue that a number of complex, tough issues that commonly “require in-depth knowledge on their nature and possible solutions. These problems also involve a number of actors and if not carefully managed may result in chaotic processes, conflicts as well as with unwanted and unexpected outcomes. Such is the complexity of the admission processes in Higher Education South Africa. The authors, Opolski *et al.*, (2013:99) further assert that network governance has the responsibility of establishing policies while public administration network is responsible for its implementation. O'Toole (2015:365) argues that although networks can be influential in shaping the processes, outputs, and outcomes of public action and they may contribute to public sector performance. Network action may also cause disruption and increase conflict, while managerial network does boost performance it may not always be the case (O'Toole 2015:365).

Klijn & Koppenjan (2000:137) argue that ‘network management’ focuses more on mediating and co-ordinating inter-organisational policy making with the theoretical basis for such alternative view found in the network approach to policy and subsequently implementation. The Table 4.1 outlines the core concepts of governance network theory.

Table 4-1: Core concepts and assumptions of governance network theory

Core concepts of governance network theory	
Actors, interdependency and frames	Policy and service delivery are formed and implemented in a network of interdependent actors.
Interactions and complexity	A consequence of the interaction of many actors rather than of the action of one single actor
Institutional features	These can be understood as patterns of social relations (interactions, power relations) and patterns of rules.
Network management	Aimed at facilitating interactions, exploring content and organising interactions between actors.

Source: Klijn & Koppenjan (2012: 591)

In a network, one part cannot function independently. This is more so in intergovernmental relations (Klijn & Koppenjan 2000:137; Koppenjan & Klijn 2015:137; Opolski *et al.*, 2013:99). All actors in this regard are necessary and as such have to be in support of each other in order to complete the objectives of the bottom-up approach (Chettiparamb 2016: 1295; Klijn and

Koppenjan 2000:137). The role of collaboration as well as trust are critical in so far as service delivery and innovation public policy is concerned (Best & Holmes 2010:153; Klijn & Koppenjan 2012:597). Engagement and interaction is also key, which require leadership skills (Klijn & Koppenjan 2012: 597) According to Flowerday, Johl, & Von Solms (2014:122) “collaboration between institutions as subsystems can also play a vital role in the governance objectives of the HE system.”

This makes these networks complex from an institutional point of view. In the context of the CAS study, the network will include, the CAO (applicants and staff) and staff and students and both DUT and UKZN. For the PSET-CAS implementation, this network may include various stakeholders, DHET, both public and private universities and university of technologies, TVET colleges (both public and private) and so on in this arrangement. These are critical stakeholders that need to work together in this process to address the lack of efficiency and effectiveness in the management of the application processes. The DHET, universities, prospective students and so forth. In view of the meta-theoretical framework and the contributions of network management and network governance the study the actors are the CAO, DUT and UKZN staff and students. This facilitated the data collection process which is discussed in the research methodology chapter to follow. The authors further indicate importantly that members in the network can be linked to many different connections and flows, such as information, financial resources, social support and so on Best & Holmes (2010:151). A point to note with concern is that Government's resolution to implement the CAS is an evolving process and no approach can be said to be the best approach in this regard. Various actors thus contribute to this complex phenomenon. Opolski *et al.*, (2013:103) present the following multi-dimensional measurement and criteria for public administration network taking place among numerous network nodes which is a general method found on the input-output scheme in the public sector. The authors considered some elements of balance score card and presented the model below of measuring public administration effectiveness (see Figure 4.5 below).

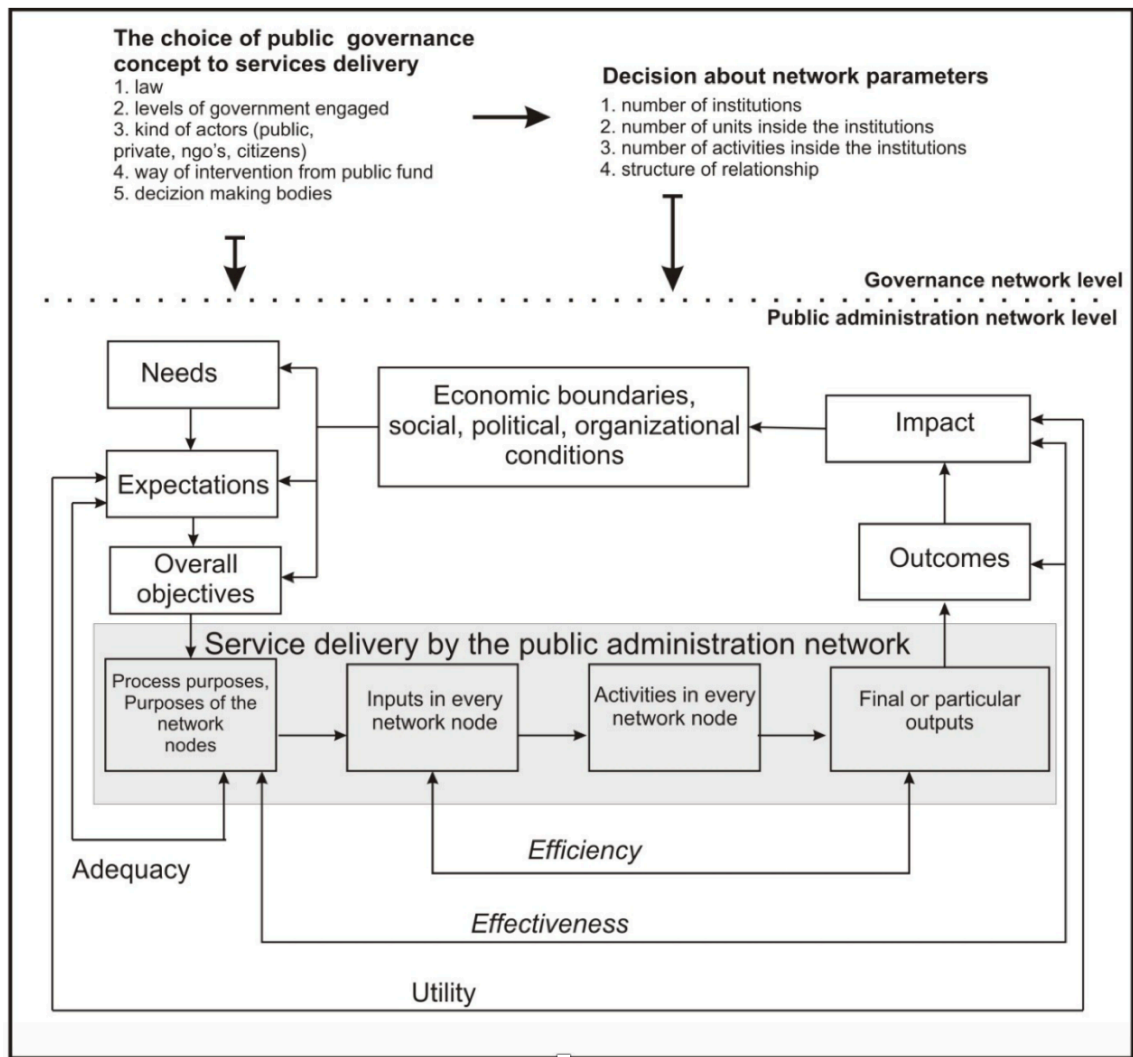


Figure 4-5: Input-Output Scheme For Public Administration Network - a model for measuring effectiveness

Source: Opolski *et al.*, (2013:103)

The levels can be specified on which networks in public administration can be studied whereby the first level is a level of governance, on which a way of delivering services is chosen. Opolski (2013:104) identifies the actors in a network and the decision making bodies. According to Opolski (2013:104) “on the governance network level decisions about network parameters are needed, i.e. number of institutions acting during service delivery, number of units inside the institutions, number of activities inside the institutions, structure of relationship”. This is where parameters are set and objectives are formulated, as expected from clients. Overall objectives of the public administration should be to determine many particular aspects of the process such as its purposes as well as the aims of the network nodes. Inputs at every network unit should be appropriate to activities needed in every network node and to expected outputs Opolski *et al.*, (2013:104). As an improvement to public the balance scorecard, aspects of this model are adopted

in the current study to improve the ability of the study to measure the effectiveness of the CAS and consequently the PSET-CAS.

In Opolski *et al.*, (2013:101) the multi-dimensional approach is extracted as a preferred model for measuring public administration effectiveness with most similarity in its application for the ultimate goal of addressing effectiveness of the CAS. This is so because this model is argued to be useful for studying by specifying the levels in public administration. To provide a context, the CAS effectiveness means provision of quality service, enabling meeting of targets, and gaining information through high quality consistent and reliable data (Blasch, Valin & Bosse, 2010:1; Stewart-Weeks, 2015:72). Effectiveness in this regard is “doing the right things” which is setting the targets for achieving the overall goals or effects (Førsund, 2013a:8; Valin & Bosse, 2010:1). This model expands this view and also include the actors from the network management perspective. This means that in order for the CAS to be successful all key role players would have to make a meaningful contribution. The next two sections discuss both the theories and concepts related to efficiency and effectiveness in public administration as well as the efficiency and effectiveness of the applications process, which is the subject of this current study.

4.5 Efficiency and Effectiveness in Public Administration

Higher education institutions operate through public administration to deliver services. 'Efficiency' and 'effectiveness' are terms which are commonly used in characterizing the service expected in this regard, however, in many respects these terms prove to be difficult to operationalise. A challenge in most cases is how to measure them, with Fitz-Gibbon & Tymms (2002), as cited in Førsund (2013a:4) asserting that efficiency is a question of doing things right, which refers to outputs, and effectiveness doing the right things, meaning the production of outputs contributing to outcomes being realised. Blasch, Valin & Bosse (2010:1) define efficiency as doing things in the most economical way, that is, having a good input to output ratio, and effectiveness as doing the right things, which is setting the targets for achieving the overall goals or effects. The desired outcomes are termed the high objectives of service. For Førsund, (2013a:8), although the notions of efficiency and effectiveness are used differently, the definition of efficiency is doing things right and effectiveness doing that right thing in an explicit way. Efficiency is thus generally about doing something well, without wasting any time.

The relationship between efficiency and effectiveness can be understood when one looks at the relationship between effects and outputs, as well as efforts and inputs (Førsund, 2013a:5), yet this is difficult in practice, as identifying and measuring inputs and outputs in the public sector are not

easy. It is difficult to quantify the effects or outputs of public service to the citizenry. Mihaiu, Opreana, & Cristescu (2010:133) argue that the relationship between efficiency and effectiveness is that effectiveness is a necessary condition for achieving efficiency. Mihaiu *et al.*, (2010:135) also indicate that there is no efficiency without effectiveness. This is because it is more important to do well on what one has proposed (effectiveness) than to do well on something that was not necessarily difficult. Notably, Manzoor (2014:4) contends that efficiency in public administration covers much more than the numeric input–output relationship, i.e., in addition the organisation has set tangible and intangible goals, therefore, output in the public sector is not easily measurable.

Organisations that need to innovate or change processes have similar objectives, which is to effectively meet the needs of their customers by providing quality service (Damanpour & Aravind, 2011:426, Stewart-Weeks, 2015:72), ultimately leading to higher service delivery outputs (Micheli and Neely, 2010:592). This may be technological or administrative innovation, but either way changing the approaches is informed by the need to produce better outcomes, be it for public good or for profit (Damanpour & Aravind, 2011:426). Furthermore, Damanpour and Aravind (2011:426) postulate that any administrative or process changes are introduced and oriented by the desire to serve efficiently and effectively in any business or organisation.

It is however difficult to implement a change or innovation in the public sector (Stewart-Week & Kastelles, 2015:66), although this innovation adds value in terms of better service. It informs the need to address the challenges with the current applications process and deals with how efficiency or effectiveness can be achieved by a change in process, specifically centralising all applications to HEIs. Studies have shown that there is a need to deal with inefficiencies in order to determine the efficiency or effectiveness of an organisation (Andrews & Boyne, 2010:451; Blasch *et al.*, 2010:1). To operationalise the concept of efficiency and effectiveness in informing the centralised model of application processing, the desired outcomes must be identified, i.e., the seamless processing of applications for admission. This objective should be met without the chaos that has been inherent in the current procedures of processing applications and admissions in the South African HE sector.

The next section discusses efficiency and effectiveness of applications processing in public HEIs.

4.6 Efficiency and Effectiveness of Applications Processes in Public Higher Education Institutions

HEIs, as public organisations, are mandated to provide efficient services to all citizens (Constitution of the Republic of South Africa, 1996). In South Africa, unlike in some other countries, these services are provided against the backdrop of historical challenges that need to be overcome in order to ensure that access, diversity and equality principles are met (Badat 2010:2; Govinder, Zondo & Makgoba 2013:5; Mdepa & Tshiwula 2012:20). The provision of these services has to take place while safeguarding efficiency and effectiveness. In pursuance of the provision of services, public administration is rooted and grounded in the achievement of efficiency and effectiveness. The need for the CAS comes as DHET responds to HEIs having been seen to be inefficient and ineffective in the management of their admission processes. The roll-out of the CAS can be seen as government's response to better address and minimize tragedies and inefficiencies that the HE sector has experienced. It remains important that government bring about some innovative ways of responding to the needs of its citizens (De Vries, Bekkers & Tummers, 2016:3), and avoiding physical pressure points, for example, the death of a parent while seeking admission for her son at UJ. These approaches may even include how ICT can contribute to efficiency in the public sector (Archmann & Iglesias, 2010:30; Blasch *et al.*, 2010:1). Peters, Pierre & Randma-Liiv (2011:4) postulate that studies of organisational change in the public sector indicate that the employees of public organisations have ideas about change that they may only be able to implement through policy and policy adjustments that will assist organisations.

Manzoor (2014:1) contends that efficiency is one of public administration's imperatives, hence it has a permanent position in studies on public administration. Accordingly, Mzangwa (2018:71) argues that "few students who manage to gain access find it difficult to participate up to an acceptable level since they are usually ill-prepared as the result of poor high school education and the less resourced background from which they come." The application process ultimately informs consternations with which the HE sector has to deal in order to manage applications and admission to undergraduate programmes. The bottom line here is that efficient and effective service delivery in HEIs has to ensure that student satisfaction is achieved in the provision of services offered by HEIs. This is the reason why this is the key focus of the current study whose aim is to improve the processing of applications and admissions in HEIs.

Due to a number of complaints from applicants and society in general, Auddy & Mukhopadhyay (2014:26) justify the need to review the admission process, arguing that "it has become an absolute necessity, for the well-being of the society, to make this admission process hassle-free and transparent for the benefit of all the stakeholders involved in the admission process." Dunion

& O'Donovan (2014:24) indicate that universities are looking to gain a competitive advantage over the other institutions by improving their administrative efficiency in functions such as admissions and registration processes. HEIs do this by improving the way they provide services to their students, illustrating that the purpose of a system is to achieve what matters, which in this case is optimising satisfaction and efficiency for system users. An applicant's expectation when applying is that he or she will access facilities, services and information about universities in the simplest of ways possible (Dunnion & O'Donovan, 2014:27).

Information should be conveniently available so that applicants can make informed decisions and also to understand the admission requirements and application procedures. A shorter response time could add value to institutions, thus CAS needs to ensure that the efficient processing of the applications is carried out accurately and within the dedicated periods. Arguably, technology is instrumental in ensuring efficiency in the application process, as institutions depend on technology for the efficient dissemination of information (Micheli and Neely, 2010:592). Online platforms such as websites and application systems are pivotal in the application process. Given the above arguments, one can deduce that HE admissions should be made available on multi-entry platforms through either centralised or decentralised models. Although the above narrative may seem simple, a number of conditions influence the application process, resulting in challenges, hence the recommendation to centralise applications.

As previously indicated, one cannot discuss efficiency without including effectiveness as these terms are used together in relation to technical efficiency (Manzoor, 2014:28). However, different scholars deal with the measurement of efficiency and effectiveness in various ways. In public administration, the interaction between inputs, outputs and outcomes are relative to the performance productivity of human beings (Mihaiu *et al.*, 2010:132). For example, Blasch *et al.*, (2010:2) argue that the operating condition or basis for effectiveness is information gain, which indicates high quality data and that data being consistent and reliable. Another measure of effectiveness and efficiency is referred to as Data Envelope Analysis (DAE), which measures productivity and economic performance (Chiou, Lan & Yen, 2010:488; Cook, Liang & Zhu 2010:433). Measuring relative efficiency in HE using DAE will not be adequate (Obadić & Aristovnik, 2011:373) for while this model may be ideal in the private sector with its focus on financial and economic productivity, it is not appropriate for an analysis of a public HE system when the specific outputs cannot be sold in the market (Førsund, 2013b:272). In support of the above, Mihaiu *et al.*, (2010:132) argue that one should be careful with inferences that efficiency is associated with the private sector and not with the public sector, as there are complexities associated with the latter and the provision of service.

Taken as a whole, the foregoing subsections have reviewed various concepts and practicalities related to HE generally and application processing, in particular. Scholars have defined efficiency “as doing things right,” which may include economical outputs (Blasch, Valin & Bosse, 2010:1; Kristof De Witte & Laura López-Torres, 2017:5) and effectiveness “as doing the right things,” that is meeting the set targets (Blasch, Valin & Bosse, 2010:1; Kristof De Witte & Laura López-Torres, 2017:5). Others indicate that efficiency can be measured using specific models such as Data Envelop Analysis (DEA) while for Blasch, Valin, & Bosse (2010:1) there is a measure of effectiveness (MOE) of a system. Without complicating the narrative of the study and remaining focused on meeting the objectives of the CAS, it is necessary for the researcher to have a clear definition of the both the CAS efficiency and effectiveness concomitantly. This grounded the study and presented a meta-theoretical framework as a guiding principle as indicated in section 3. In the South African context, adopted from an array of literature both CAS efficiency and CAS effectiveness concepts are outlined in the next section.

4.7 Meta-theoretical Framework

Sections 4.2 to 4.6 discussed a number of public administration theories and concepts relevant to the current study, with the recognition that there are other theories and concepts that were not considered. Of the theories and concepts discussed, the researcher had to decide which one or ones would be most useful in guiding this study. The researcher designed a meta-theoretical framework within which network theories (Førsund 2013b:272; Johl *et al.*, 2014:122; Klijn and Koppenjan 2012:359; Opolski *et al.*, 2013:100; Whitney *et al.*, 2015:20), serves as the backdrop of the framework and theories and concepts of efficiency and effectiveness are encapsulated therein (see Figure 4.7 below).

To re-iterate, this study on the CAS for public HEIs in South Africa is aimed at determining if the CAS is a fit and a proper system for the country. A governance network and the efficiency and effectiveness of it are critical to the success of the PSET-CAS. Again, should the PSET-CAS fail to deliver on its mandate of providing effective and efficient application service for all stakeholders, it will be a setback for HE, which may come at a high price.

This section displays how the theories are operationalised to meet the objectives of the study and to help address the research problem as stated in section 1.3. An underlying framework based on the classic input, output, outcome model indicative of public administration approaches is shown in Figure 4.6 below. This framework is then inserted against the backdrop of network governance theory contributes to the meta-theoretical framework underpinning the study. The latter is diagrammatically depicted in Figure 4.7 below. The framework in figure 4.6 emerges from the

literature review presented in this chapter and it is important that it delineates how the efficiency and the effectiveness of the CAS can be investigated and subsequently allow the possibility of addressing the research problem as stated.

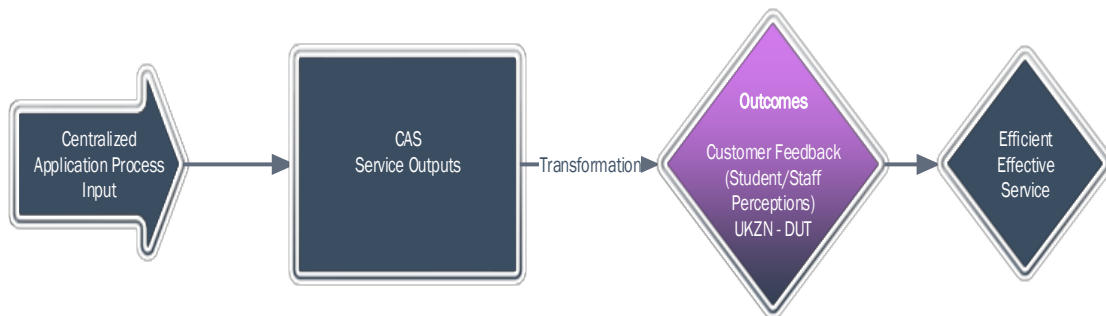


Figure 4-6: Input Output Outcomes Framework for CAS at DUT and UKZN
Source: Adapted by the researcher from Førsund (2013a:4-10)

For Førsund (2013a:2), the measurement of effectiveness involves two stages as inputs are first converted to outputs, then service outputs affect the consumer's satisfaction, meaning that the outcomes or objectives are realised. Figure 4.6 diagrammatically projects these components. The researcher adopted this model to guide the collection and analysis of the data after much deliberation. The meta-theoretical framework serves as guide for this study to demonstrate how this study can inform the policy changes regarding HEs can have efficient and effective application processes. The CAO provides a service (inputs) for the organisations, that is, it manages the application processes for DUT and UKZN, and converts these inputs into service outputs. For example, CAO's capturing of applications onto the IT system is an input whilst CAO's provision of feedback to students about their applications is service output. The third stage transforms the service outputs to outcomes, for instance, the way in which the service provided by the CAO affects both university staff and students. At this time, the CAO does not have influence over clients' perceptions, which are dependent on customer satisfaction.

Adopting the rationale from Førsund (2013a:4), the classifications used were that the public unit produces the services, in this case the CAO and the universities. Inputs are operationalised as the actions or tasks of staff and students as users of the CAS. Service output means the product or services to which the action or tasks lead, or which are transformed to outcomes. Outcomes represent the desired expectations of staff and students as to the results experienced when using the CAS, in essence the CAO experience (Førsund, 2013a:2). These variables will be reflected in the data collection tools to assess the efficiency and effectiveness of the CAS, an interaction of variables to be analogised to the CAS to assess its performance productivity. The above framework will be extended in the next section.

Consistent with the flexibility embedded in pragmatism, the study takes an opportunity to deepen the analysis in order to develop a frame-work for the PSET-CAS, which expands the boundaries of just the perceptions from DUT and UKZN staff, but rather to enhance theory of Public Administration governance to answer the fourth research question. Which in itself requires additional tools of addressing the complexities by acknowledging that HE is a system that has a number of attributes that will enable this study to be comprehensive and so the accepted meta-theoretical framework is presented in Figure 4.7.

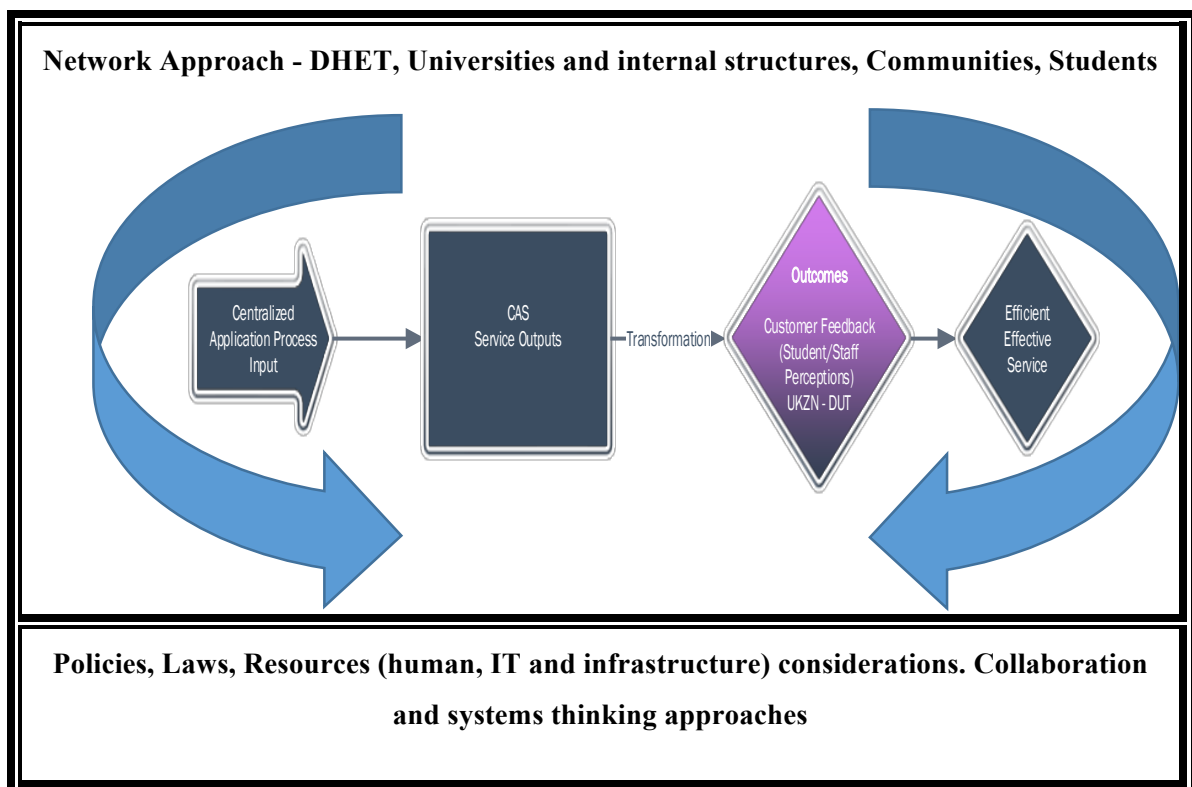


Figure 4-7: Operational meta-theoretical framework

Source: Adapted from: Blasch, Valin & Bosse, 2010:2; Chettiparamb 2016:195; Forsund, 2013a:4-10; Haynes 2015:22; Klijn & Koppenjan 2012:594; Kristof De Witte & Laura López-Torres, 2017:5; O'Toole 2015:362.

Public Administration theories and concepts related to input-output-outcome models underpinned the data collection and analysis, as well as the research findings. The meta-theoretical framework guided a robust synthesis of staff and students' perceptions about the CAO, in order to determine if the CAS model is fit to bring about the desired outcomes. The desired outcomes are effective and efficient application processes that will address the challenges and unfortunate scenes outlined above. Blasch *et al.*, (2010:3) argue that in order to determine the contribution of any system it has to be tested and evaluated. Considerations and recommendations about policies to guide the implementation of the PSET-CAS can be guided by the meta-theoretical framework

presented in figure 4.7. HE as indicated in Klijn & Koppenjan (2012: 591) and depicted in Table 4.1 above. In order to ensure efficiency and effectiveness of PSET-CAS all actors have to support each to meet the objectives, that bottom-up approach (Chettiparamb 2016: 1295; Klijn & Koppenjan 2000:137). The CAS is a new phenomenon and therefore its effectiveness and efficiency has to be tested. The researcher tried but was unable to locate any existing studies on the CAS in South Africa. Using the contributions from DUT and UKZN, this study required a model for measuring efficiency and effectiveness. Based on the theories and concepts that emanated from the literature review, the relevant meta-theoretical framework had to be determined to assist in the process of data analysis and reporting.

4.8 Chapter Summary

This chapter unpacked some of the relevant public administration theories. A number of approaches were discussed on how efficiency and effectiveness can be aided through key policy constructs. These approaches are systems thinking approaches, network management and network governance approaches. Theories of efficiency and effectiveness subsequently contributed to the meta-theoretical framework depicted in Figure 4.7. A combination of all the above will guide the data presentation and analysis in the current study. This will aid the achieving of the research objectives of the study as set out in Chapter One. The next section of this study examines the research methodology which was applied in order to understand this phenomenon.

CHAPTER FIVE: RESEARCH METHODOLOGY

5.1 Introduction

This chapter deals with the research methodology the study applied. On the one hand, methodology signifies a model of conducting research. On the other hand, research methods are steps, techniques, procedures, approaches (Azorín, & Cameron, 2010:95; Baxter & Jack, 2008:544; Wahyuni, 2012:72) that can be used to conduct research or gather needed evidence in research. The techniques and methods chosen and utilised by the researcher to address the research questions and achieve the research objectives will be detailed in this chapter, as will the research paradigm, historical underpinnings, research design and strategy. The chapter describes the nature of the research, data collection and methods, and provides details about the target population, sampling strategies and techniques applied. Data analysis and a discussion on data quality control, ethical considerations and the limitations of the research study are outlined. In this study the synergy is expressed in paradigmatic, theoretical as well as methodological triangulation which are each detailed in this chapter (Halcomb & Hickman 2015:5; Modell, 2015:1131-1141; Ness, 2015:1141). The final section of the chapter gives a brief summary of the chapter.

5.2 Research Paradigm and Philosophical Underpinnings

The section on the research paradigm and philosophical underpinnings clarifies for the reader the beliefs and assumptions that guided this study. Research paradigms are set of philosophical assumptions and beliefs that significantly influence both the framing and understanding of a phenomenon (Modell, 2015:1131; Petersen & Gencel 2013; Khan 2014; Wahyuni 2012:69). According to Denzin & Lincoln (1994:99), paradigms encompass three elements, epistemology (how do we know the world?), ontology (the relationship between nature and reality), and finally methodology (how we gain knowledge about the world). For Biddle & Schafft (2015:325) “axiology is a belief about what should be done under the circumstances.” Wahyuni (2012:69) further defines a research paradigm as “a set of fundamental assumptions and beliefs as to how the world is perceived which then serves as a thinking framework that guides the behavior of the researcher.” Paradigmatic dualisms include norms about the objective and subjective nature of reality. The differences of the quantitative and qualitative methods thus interrogate larger ontological questions of the nature of reality given the available data, and for analysis of the data (Biddle & Schafft, 2015:323).

Khan (2014:299) asserts that the researcher should seek to answer the question: What does the world look like from a scientific perspective? Within the various paradigms, different ontological epistemological, axiological worldviews are found (Lincoln *et al.*, 2011:167). The approaches are furthermore described as decisions, plans and procedures of inquiry and design, which are followed by various methods of data collection, interpretations and analysis (Creswell 2014:190; Khan 2014:298).

The fundamental challenge is which paradigm to select. The dominant paradigms are post-positivist, constructivist or interpretivist, advocacy and participatory, and pragmatist (Petersen & Gencel 2013:1-4; Khan 2014:290; Wahyuni 2012:70-71). Below are the paradigms as depicted in Petersen & Gencel (2013:1).

Table 5-1: Philosophical worldviews

POST-POSITIVIST	CONSTRUCTIVIST/ INTERPRETIVIST	ADVOCACY AND PARTICIPATORY	PRAGMATIST
Evidence is always imperfect and fallible; therefore, evidence does not prove a hypothesis, but indicates failure or rejection of a hypothesis.	This view seeks a subjective reality, which is constructed by what human beings see and how they interpret the world in their respective contexts. truth is therefore relative.	An inquiry needs to be intertwined or linked to a particular political agenda or politics of reformation that changes the lives of those participating.	Uses all approaches available to understand the problem instead of focusing on certain methods. Considers prevailing circumstances.

Source: Petersen & Gencel (2013:1)

In this research, post-positivist, pragmatist and, constructivist worldviews were applied to examine the CAS. This combination of these paradigms gave the researcher flexibility to use and analyse both statistical and qualitative data, to determine what the CAS is and how it works and the knowledge that is created and sustained by the participants in this study (Lincoln *et al.*, 2011:167). Biddle & Schafft (2015:323) indicate that “pragmatic inquiry focuses on knowledge as the fallible and constantly revised product of experience.” Halcomb & Hickman (2015:5) argue that “a pragmatic approach involves the researcher using “what works” in order to seek answers to the research question.” Scotland (2012:9) asserts that while ontological suppositions are mainly concerned with what is part of a reality, epistemological presuppositions are concerned with knowledge creation. For (Biddle & Schafft, 2015:325) axiological underpinnings will be concerned with what method should be used to produce knowledge. These assumptions and beliefs provide direction on how research should be undertaken.

The pragmatic duality allows for a fruitful mixing of approaches. Petersen & Gencel (2013:81) advises that the worldviews that are adopted depend on the objects of the study, i.e. if the study is about the organisation (DUT/UKZN staff and students) interpretivist worldviews may dominate, but if it is about a particular hypothesis to be tested, then a positivist worldview will dominate.

Selection of the post-positivist approach was informed by the variables contained in the hypotheses tested, while the constructivist worldview was entrenched in how the participants constructed and interpreted their views regarding the CAS, which enabled the research questions to be answered. Consequently, from a pragmatic view point, the use of a number of both qualitative and quantitative methods in this enquiry is complemented by the varying theoretical grounding discussed in chapter four. This flexibility enabled the researcher to engage the theories available in order to evaluate the CAS, efficiency and effectiveness. Indicative of the meta-theoretical framework presented in figure 4.7, to answer the research questions and achieve the research objective in Section 1. 4.

Paradigms are important in determining how concrete studies are evaluated. The authors, Mitchell and Education (2018:106) informs us that “pragmatism supports the use of different research methods combined with continuous process of abductive reasoning and various modes of analysis.” This is indicative of this research, where the objective was to test the null hypothesis, i.e. ‘The CAS model does not bring efficiency and effectiveness to the application process’ and the alternative hypothesis – ‘the CAS model does bring efficiency and effectiveness to the application process. The post-positivist paradigm is useful for hypothesis testing. In terms of the interpretivist paradigm, this study benefits from how staff at DUT and UKZN view the use of the CAS based on the CAO experience. The constructivist researcher does not hold the believe that reality is absolute, but rather can derive from community consensus regarding what is real (Lincoln *et al.*, 2011:167). The integral part of combining post-positivist and constructivist paradigms is that in an investigation, the researcher comes to understand how people construct their perceptions and realities of their worlds. These paradigms enabled the researcher to acknowledge the value of objective but imperfect truths about CAS and subjective perceptions with multiple truths against epistemological and ontological backgrounds (Creswell 2014:190; Lincoln *et al.*, 2011:167). The next section discusses the mixed method research design. It explores why that selection was ideal for this study.

5.3 Research Design: Mixed Method

A research design is a plan or a blueprint specifying how the data collection and analysis of the study was employed (Berger & Wong 2009:6). These are methods and/or procedures applied to give a researcher capacity to gain a deep understanding of the research problem. Williams (2011:65) advises, “researchers typically select the quantitative approach to respond to research questions requiring numerical data, the qualitative approach for research questions requiring textural data, and the mixed methods approach for research questions requiring both numerical and textural data.” Tashakkorie & Teddie (2010:5) defines mixed method as “the broad inquiry logic that guides the selection of specific methods and that is informed by conceptual position common to mixed method practitioners”. Simply put, practitioners reject the either/or choices of a specific method. A researcher integrates the most appropriate techniques from both qualitative and quantitative approaches, and then mixes strategies to thoroughly investigate a phenomenon of interest. Biddle & Schafft (2015:322) argue that most researchers, regardless of their preferred method of inquiry (qualitative or quantitative), would acknowledge that axiology plays an important role in the selection and formation of research questions, driving their interest in certain issues over others.” Informed by the complex nature of the CAS phenomenon, research questions, objectives and the proposed hypotheses, this study used a mixed method design.

Klassen, Creswell, Plano, Clark, Smith and Meissner (2012:378) argue that “the use of mixed method is most suitable when a quantitative or qualitative approach, by itself, is inadequate to develop multiple perspectives and a complete understanding about a research problem or question.” Meanwhile, Fielding (2012: 2) asserts that we do not just mix approaches because there is something intrinsic or distinctive about either quantitative or qualitative data, but to integrate the two fundamental ways of thinking about social phenomena. The mixing is thus at the heart of mixed method research, so the researcher is warned to pay special attention to the epistemological precepts that underpin both qualitative and quantitative methods (Denzin 2010:420; Fielding 2012:4; Creswell 2013:207). The mixed method approach provides a better understanding of the research issues than one method would (Creswell 2013:302; Palinkas, Aarons, Horwitz, Chamberlain, Hurlburt & Landsverk, 2011:44). The choice of a mixed method approach for this study was influenced by the need to collect relevant data to bring to the fore and describe the perceptions and subjective experiences of staff and relatively objective experiences of students at DUT and UKZN.

The study included a combination of qualitative and quantitative approaches to gather multiple positions from a reasonable number of students for this research project, while still benefitting from the perspectives of the staff members at CAO and the selected universities that use the CAS

system. In addition, as the CAS is intended to be used by all HEIs in South Africa, it is important to have as much feedback as possible regarding the system. Bazeley (2008:138) argues that mixed methods are employed in settings where it is necessary to produce meaning from multiple data sources in order to understand phenomena. The practicality of gathering adequate data from students was supported by the survey and interviews, a group interview and focus groups with the staff.

The mixed method was operationalised in various ways in this study, i.e., at the level of sampling, collection, and analysis of data. The design allowed the researcher to compare results from qualitative and quantitative data in order to answer the research questions and test the hypotheses. Creswell (2009:14) has identified three main forms of mixed methods, namely, sequential, concurrent and transformative. In this study, the term 'mixed method' is employed to describe the concurrent integration of both quantitative and qualitative approaches in one study, with the aim of enhancing the quality of the research findings. The convergence in the study occurred simultaneously from the data collection, analysis and interpretation. In a concurrent mixed method, the investigator collects both qualitative and quantitative forms of data at the same time, then integrates the data during the data analysis and interpretation stages (Venkatesh, Brown & Bala, 2013:3). The alternative is a sequential mixed method, which is when a researcher begins with either a qualitative or a quantitative study for exploratory purposes, and follows up with the other approach (Creswell, 2009:14). This method was not preferred due to time constraints and other factors, which will be discussed in the data collection section.

The mixed method approach accorded the researcher the opportunity to focus on collecting, analysing and merging the qualitative and quantitative research findings, while gaining a detailed understanding of the phenomenon (Palinkas *et al.*, 2011:44). Delpont & Fouche (2011:441) suggested that it also allows the researcher to develop a suitable measuring instrument in a qualitative study, then follow up with a comprehensive quantitative study with a larger sample. As a result of the nature of the data that needed to be collected in order to meet the specific research objectives as stated in section 1.4, this empirical study made use of both qualitative and quantitative approaches for data collection and analysis. The research strategy is discussed next.

5.4 Research Strategy: Single Case Study

Yin (2009a:18) defines case study as “an empirical inquiry that investigates contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident,” Whereas according to Thomas (2011:512) “an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular

project, policy, institution, program or system in a real-life context.” Both definitions indicate that a case study design has a set of explicit procedures for conducting research into real life phenomena that are current, ambiguous or unclear, and that exist within specific boundaries. Case study design is in-depth, detailed and even descriptive (Baxter & Jack, 2008:544; Ishak & Bakar, 2014:31). In this study, the case study was the CAS in the context of UKZN and DUT, which is where the type of knowledge and information about implementation of the CAS can be gained. To add to the complexity, the CAS is a system that exists within an organisation named the CAO. In addition to the above, the case study design was preferred because of the analytical conclusions that may have arisen from the two institutions (Yin, 2009b:53). The next section outlines the case study design and justification.

5.4.1 Case study design

A case study can be treated as a strategy or a design and case studies can be descriptive, exploratory or explanatory in methodology (Baxter & Jack, 2008:545; Yin, 2009a:8). The selection of any of these types depends on three factors listed by Yin (2009a:8). These are: (1) the type of research question posed; (2) the extent of control an investigator has over actual behavioural events; and (3) the degree of focus on contemporary as opposed to historical events. This study questions the perceptions of staff and students, as well as how the CAS can facilitate efficient and effective service delivery. Posing and answering such questions to capture perceptions can assist with developing hypotheses for further enquiry (Yin, 2009a:9).

The researcher had no control over the circumstances at the CAO or the universities so the study focused on contemporary events regarding the HE application processes during a time of increased concerns about enrolment trends in HE with problematic service delivery in terms of admissions. This study was exploratory in nature as it sought to generate new knowledge, and descriptive in terms of describing CAS operations as well as student and staff perceptions about CAS implementation (Baxter & Jack, 2008:544; Yin, 2009a:8). This new information is subsequently discussed in the final chapter.

Case studies can be conducted using different designs, for instance any of the four Yin (2009a:46) identified as: single-case (holistic), single-case (embedded), multiple-case (holistic) and multiple-case (embedded), the selection being informed by the conditions and characteristics of the units of analysis. This study used a single-case design embedded with multiple units of analysis, described by Ishak & Bakar (2014:30) as able to contribute significantly to knowledge and theory building about an extreme or unique case. The case was the CAS and the embedded units of analysis were the CAO employees, as well as staff and students at DUT and UKZN. The CAO

informs how the CAS is operating in South Africa, while both DUT and UKZN use the CAS for application management. The main justifications for using a single embedded case study were a lack of resources and time, to be clarified in more detail in the limitations section of the study. The conceptual framework of the study shows the relevance of DUT and UKZN staff and students embedded in the CAO's operations. This complexity is why this study was undertaken as a single case (embedded) design and the contextual conditions that characterised it were also considered, hence the universities being engaged (Ishak & Bakar, 2014:31; Thomas, 2011:516; Yin, 2009a:46).

5.4.2 Site and participant selection

Also important when using a case study design as a research strategy is the selection of a site and participants. In KZN, the CAO offers service to DUT, UKZN, the University of Zululand, Mangosuthu University of Technology, TVET and private colleges. For practical and economic reasons, the researcher had to be realistic in selecting the sites that would address the research questions regarding the CAS (Ishak & Bakar, 2014:30). The selection of both DUT and UKZN was informed by both institutions being public and representative of two different types of universities. DUT is a university of technology and UKZN a research-led institution. Most importantly, however, both used the CAO to manage their application processes.

For selection of participants, the respondents from these universities held the requisite specific knowledge about the system. As stated above, the units of analysis were staff at DUT, UKZN and the CAO, as well as students from each university as stakeholder segments (Adler & Clark, 2011:104; Berger & Wong, 2009:6; Yin, 2009a:9). Apart from the KZN experience there is currently no known point of reference for the CAS model in South Africa, thus the research domain necessitated the inclusion of participants from the CAO, and KZN universities such as DUT and UKZN.

The next section details the sampling strategies and procedures for the qualitative components of the study, followed by the quantitative sampling strategies and procedures.

5.5 Sampling

This section describes the target population as well as sampling strategies and procedures for qualitative and quantitative research. Sampling is a process the researcher follows to draw a number of respondents from a larger population (Adler & Clark, 2011:104), several qualitative strategies and techniques of which are detailed. Qualitative sampling strategies and techniques, as well as the justification for the selection of those techniques, will be explored in Section 5.5.2,

and Section 5.5.3 will deal with the quantitative sampling procedures. Data quality control will be discussed in detail in Section 5.8. The target population is discussed next.

5.5.1 Target population

A study population of theoretical interest the target population refers to all people who have the possibility of being selected to participate (Adler & Clark, 2011:103; Robinson, 2014:2). For this study it comprised staff at the CAO, certain administrative staff members at DUT and UKZN, as well as first and second year students who had recently experienced the CAS. Qualitative researchers approach sampling differently from quantitative researchers, their aim being to deepen understanding of the phenomenon (Ishak & Bakar, 2014:30; Tavakol & Dennick, 2011:256). Sampling strategies were classified into non-probability sampling for the qualitative approach and probability sampling for the quantitative approach (Adler & Clark, 2011:104; Ishak & Bakar, 2014:29). Information regarding sampling for the qualitative component of the study follows.

5.5.2 Sampling for the qualitative component

A strategy that is often connected to qualitative research, Bryman (2012:187) indicates that non-probability sampling does not give each member of the population a chance to be selected for study participation. This scholar further advises that non-probability sampling can be used when it is extremely difficult to obtain a probability sample, and the opportunity to study a certain group presents itself and cannot be missed. Trotter (2012:399) asserts that the ideal standard for a qualitative sample size is to interview until redundancy or saturation is reached, when the same concepts or themes are repeated many times and no new ones emerge (Marshall, Cardon, Poddar & Fontenot, 2013:11; Robinson, 2014:28-31; Trotter, 2012:399). The researcher had to ensure that the sample is not contaminated.

Non-probability sampling was employed through the techniques of purposive sampling and snowball sampling. Anney (2014:278) argues that purposive sampling gives the researcher greater findings than probability sampling, because the participants are key due to their knowledge about the issues under investigation. The researcher was guided by the research objectives when purposively recruiting and selecting the interviewees and focus group respondents (Adler & Clark, 2011:125; Trotter, 2012:400). Secondly, snowball sampling was also used, a procedure that involved obtaining recommendations from the participants already recruited to identify others to include in the study (Adler & Clark, 2011:125).

For this study, purposive and snowball sampling were used because the administrators and managers shown in Table 5.2 on overleaf hold knowledge about and implement policies related to application processes. In other words, participants were chosen based on their particular characteristics, responsibilities in the selected universities with knowledge regarding the operation of the CAS. These administrators and managers deal with applications at the respective universities, thus relevant to the study objectives. The use of snowball sampling is justified since some administrators and managers referred the researcher to other knowledge-holder's policy implementers. Table 5.2 (below) outlines the segmentation of stakeholders for the qualitative component of the study and shows the date, time and location of the data collection experience.

Table 5-2: Stakeholder Segmentation Qualitative Data

Stakeholder	Site	Date	Time	Tool	Sample
Deputy Registrar	DUT	16-09-2015	15H20-16H20	In-depth interview	1
Assistant Registrar	DUT	19-09-2015	12H00-13H00	In-depth interview	1
Admissions Officers/ Faculty Officers/ Admin Assistants/Admissions Clerk	DUT	31-08-2015	9H15-10H15	Focus group	5
Director Academic Affairs	UKZN	27-08-2015	14H30-15H30	In-depth interview	1
Principal Academic Administrative Officer	UKZN	17-09-2015	15H00-15H50	In-depth interview	1
Admissions Officers/ Faculty Officers/ Admin Assistants	UKZN	26-08-2015	11H35-12H55	Focus group	12
Operations Manager Assistant Operations Manager, IT Manager and Assistant IT Manager	CAO	20-09-2015	10H00-11H00	Group Interview	4
Total Number of Participants					25

Source: Researcher's work 2015.

Participants were selected from among both the DUT and UKZN managers and administrators, as these respondents held specific knowledge about the CAS and the application process. They were thus able to divulge their perceptions about the use of the CAS based on their knowledge of using it and working with the CAO. The next part discusses the quantitative sampling component.

5.5.3 Sampling for the quantitative component

A probability sampling strategy was used for the quantitative component, which according to Bryman (2012:181) means that those in the target population have an equal chance of being included in a study. Here, the general objective is to obtain representation from the target population and so apply specific techniques to produce findings that may be accurately generalised. It allows for statistically significant tests and inferences to be made about the phenomenon while producing accurate findings, an important aspect of a survey (Bryman, 2012:190). Random sampling techniques can be used in conjunction with probability sampling

and the sampling technique for this study was a stratified random sampling method, as it has the potential to generalise findings to the larger population (Creswell & Plano, 2011:306).

Ishak & Bakar (2014:29) indicate that quantitative researchers typically have two incentives for using the probability or random sampling method, i.e., they can save time and are cost-effective. The researcher could have opted for simple random or systematic sampling, however, there was no sampling frame of all first and second year students studying at the two institutions. Therefore, the researcher used the random stratified sampling technique, a criterion being for one to be enrolled as a first or second year undergraduate students at either DUT or UKZN. They had an opportunity to participate given their somewhat recent CAO experience and required knowledge of the CAS. This sampling technique involves splitting groups into strata then applying a simple random sample to each group, which allowed the researcher to collect the same amount of information using fewer people. Bryman (2012:193) advises that the advantage of a stratified random sample is that it ensures that the resulting sample will be distributed in the same way as the population. Table 5.3 below indicates the distribution of surveys to both universities.

Table 5-3 Stakeholders for the Quantitative Data

University	Time Frame	Proposed Sample	Actual Sample
DUT	August until September 2015	150	140
UKZN	August until September 2015	150	147

Source: Researcher's work 2015

A selection of 300 respondents was considered adequate to enhance the statistical power of the study, with 150 from each institution as shown in Table 5.3 above. The justification of the sample size considered cost and time for the researcher (Bryman, 2012:197). Large samples do not necessarily guarantee precision but the researcher aimed for a level of generalisability about the CAS from these units. However, it is understood that given the high number of first and second year undergraduate students at each university (see Chapter Six), the sample size was inadequate for generalisability to all HEI students in KZN. Nevertheless, the sample size was appropriate for this research project and yielded informative findings. The study had to be manageable for the researcher. Should it be replicable for other KZN universities additional respondents can be included. The next sections discuss the data collection procedures.

5.6 Data Collection Methods and Instruments

The study embraced a mixed method research design, which means that qualitative and quantitative data provided different types of information on the constructs that were to be analysed and interpreted (Creswell, 2013:207; Klassen *et al.*, 2012:379). Concurrent data collection was most convenient for the researcher as it enabled avoiding travel for fieldwork more than twice (Creswell, 2013:2017; Tavakol & Dennick, 2011:56). Both qualitative and quantitative data carry a similar weighting in this study as the researcher aimed to assess the users' perceptions of the CAS and to determine if the CAS would bring about effectiveness and efficiency to yield positive service delivery in South African HE. The data collection methods, procedures and instruments are discussed next. The qualitative data collection procedures will be discussed in Section 5.6.1, while the quantitative data collection procedures will be detailed in Section 5.6.2.

5.6.1 Qualitative data collection

This section outlines the methods and motivations for the selection of the particular methods used in the qualitative data collection process. Qualitative researchers can select from different forms of interview design in order to obtain rich data and thick descriptions for the analysis of an investigation (Smith, 2015:58; Turner III, 2010:757). Qualitative data was collected using in-depth, semi-structured interviews, one group interview and two focus groups. The researcher provided an interview guide or a focus group guide for all data sets, made available as appendices as subsequently specifically identified. For the qualitative data set, i.e., interviews, group interview and focus groups, the researcher used a tape recorder and took notes during the sessions, generating transcripts for analysis. Based on their particular characteristics and their responsibilities in the universities, participants held specific views, experiences and information about the CAS that could contribute to the efficiency or effectiveness of the business processes (Rodriguez, Schwartz, Lahman & Geist, 2011:402; Williams, 2014:245). In-depth interviews are discussed first in Section 5.6.1.1, followed by the group interview in Section 5.6.1.2, and lastly the focus groups in Section 5.6.1.3. Documentary evidence, as secondary evidence is discussed in Section 5.6.1.4.

5.6.1.1 In-depth interviews

Bălan & Ioniță (2011:467) state that “Qualitative research is recommended in a form of in-depth interviews allowing respondents to express own opinions relative to the manner in which they manage their business, why, where, how and when, using own words”. The data collection instrument consisted of semi-structured, open-ended questions. Smith (2015:58) advises that

semi-structured interviews give the researcher and respondents the opportunity to engage in a dialogue, and have the flexibility to modify questions based on the responses. The researcher can probe for more details and interesting responses about the phenomenon under study, allowing for detailed information from the participants. Turner III (2010:757) points out that open-ended questions allow for a thick data description and analysis, and as a result can be cumbersome. This was a great opportunity for the researcher to probe and follow up, however, providing a thick description to understand the complexity of the CAS case study.

The researcher designed multiple interview guides to ensure that the instruments were appropriate for the particular respondents. The target group for the individual interviews were the Director or Deputy Registrar and the Assistant Registrar from each university. As noted above, the respondents held specific views and information about the CAS and whether it contributed to the efficiency or effectiveness of the business processes (Williams, 2014:245). Their importance in this study emanated from their having been deemed policymakers, policy-implementers, influencers, and custodians of the university's systems and processes relating to applications and admissions, and as a result relevant to the implementation of this system. The interview guide is attached as Appendix 1.

5.6.1.2 Group interview

The group interview was conducted with four senior staff members at the CAO, unexpected as the plan was to hold a semi-structured interview with one senior person at the CAO. However, as is typical of the research environment, circumstances can change and as a result the researcher was given an opportunity to interview four senior officials within the CAO. The terms 'group interview' and 'focus group interviews' are used interchangeably by various scholars, although most refer to focus groups as group interviews (Gibbs, 2012:189; Onwuegbuzie, Dickinson, Leech & Zoran, 2009:6; Stewart & Shamdasani, 2014:42). According to Gibbs (2012:189), group interviews are "a way to gather many opinions from individuals within a group setting but are largely didactic between interviewer and each individual in a group." They are distinguished by the focus group being interactive, with an individual's opinion equally important as that of the group.

Participants represented the particular stakeholders and their views had a common perspective, a type of interaction Doody, Slevin & Taggart (2012:267) referred to as a focused interview. These scholars explain that it "involves several people being brought together to discuss their views on a general topic that they have knowledge of or involvement in, while a focus group interview is confined to a specific topic area with an emphasis on the interaction within the group". This is

critical, and for the purpose of the study the interview with the CAO will be referred to as a 'group interview.' Gibbs (2012:189) notes that both focus groups and group interviews are often used interchangeably for organised discussions with a group of selected people to obtain a collective view about a specific topic. The group interview guide is attached as Appendix 3. The focus group interviews at DUT and UKZN will be clearly referenced as a focus group, and the data collection through focus groups discussed next.

5.6.1.3 Focus groups

Doody, Slevin and Taggart (2013:266) define focus groups as “a method of qualitative data collection, in which data are gathered through group interaction on a chosen topic,” and can be used in conjunction with other data collection tools such as interviews and surveys, as part of a mixed methods approach in explorative research. Focus group interviews assist researchers by tapping into different types or customs of communication that people use in their daily interactions. This interaction reveals better levels of understanding; which other data collection methods may not be able to reveal, the aim being to obtain a broader understanding of the social dynamics through the collection of verbal and observational data (Doody, Slevin & Taggart, 2012:267). Focus groups are also ideal in exploratory research, as one gathers much insight on a topic that little is known about, such as the CAS phenomenon in South Africa (Doody *et al.*, 2012:266).

A suggestion by Kamberelis and Dimitriadis (2013:3) is that the focus group approach is firmly rooted in post-positivist epistemologies, with the assumption that the truth is “out there” to be efficiently used for interpretation and analysis. Although it is a group setting, the unit of analysis was still the individual as the individual relates to the group. Two focus group interviews were set up with five participants from DUT and 12 participants from UKZN. The initial plan had been to have a focus group of eight to 12 participants; however, the researcher did not receive sufficiently positive responses from DUT. According to Bryman (2012:507), it is almost impossible to control for no-shows, and in this instance the researcher was also unable to over-recruit. The researcher went ahead with five participants, as Moloney (2011:60) notes that the intimacy of a small group provides depth in contrast to the breadth of a larger group. Some researchers also recommend four to six participants (Doody *et al.*, 2012:268), which made the researcher confident about proceeding with the five participants from DUT.

The participants were administration staff who dealt with undergraduate admissions at the respective institutions. Focus groups are useful as they enable the researcher to identify a range of issues because of the different opinions or views of a variety of participants. They are

conducted with a homogeneous group of individuals who have common characteristics and can share experiences about the subject of investigation (Rodriguez *et al.*, 2011:403). Most importantly, these views and opinions are studied at the same time (Williams, 2014:245), a technique that enhanced the elucidation of different viewpoints on the issues regarding the admissions procedures and the CAS. The focus groups enabled both the researcher and participants to co-create knowledge within a specific context, which is indicative of a constructivist approach. The purpose was to create new knowledge about the CAS phenomenon rather than just to uncover “one singular truth” about a research question (Rodriguez *et al.*, 2011:402). The admissions procedures and processes directly affect the admissions officers, therefore, they could present critical insight into the use of the CAS to deliver an effective service to the clients. Moreover, these administrators have the knowledge base of dealing with admissions.

For the focus group setting, the interaction was based on a carefully planned sequence of questions covering the discussions in themes (Bryman, 2012:507), a somewhat unstructured way that was helpful for paying attention to how the participants’ opinions regarding the CAS were relayed in the presence of a group, and how they influenced each other in a group setting (Bryman, 2012:507). The researcher met with the participants prior to the focus group and outlined once again to them the purpose of the study and encouraged them to ask questions if they did not understand anything. The focus group guide is attached as Appendix 5. Documentary evidence, as one of the qualitative data collection methods, is discussed in the forthcoming section.

5.6.1.4 Documentary evidence

Several documents were used to provide more information and clarify aspects of the study. Documents such as the CAO’s Annual Report (2015) were used to provide more details regarding its functioning and the operation, and to enhance triangulation. The researcher engaged with respondents in interpreting and examining documents to gain a deeper meaning and understanding of the topic, which assisted in the development of the empirical findings (Browen, 2009:34; Creswell, 2014:190). These reports were available on various online platforms, publicly and on request by the researcher. Critically, through the addition of documentary evidence the researcher was able to seek convergence and corroboration or the lack thereof, with other data sources. These forms of data, according to Creswell (2014:190), go beyond the typical observations and interviews. The documents that were used are outlined in detail in Table 6.6 in Section 6.5 of chapter six. This Table also explains how the documentary evidence relates to this study. The next section deals with the quantitative data collection method.

5.6.2 Quantitative data collection

Generally, quantitative a data sample is larger than a qualitative data one, allowing the researcher to conduct meaningful statistical tests (Creswell, 2014:102). The technique for collecting data was a self-completed questionnaire distributed to 300 undergraduate students. The rationale was that the students would also have a view on the CAO, and could share important information that would explain their attitudes and satisfaction regarding the efficiency and effectiveness of CAS from different perspectives. A survey satisfies the quantitative requirements of a mixed method study. Williams (2014:245) argues that questionnaires have been used in different settings to collect information about the opinions, as well as the behaviours, of clients.

5.6.2.1 Survey

The questionnaire started with basic demographic questions and later focused on specific questions related to the study. The structure of the survey comprised four sections, Section A consisting of questions on biographical information and the academic profile of students, Section B covering questions on application information, such as the amount that is spent on applications. One purpose of this section was to find out what factors facilitate or hinder the CAS. Section C covered specific questions on the CAS experience through a five-point Likert scale. The next subsection further explains Section C. Section D questioned respondents on whether the CAS model was a preferred one. The questionnaire is attached as Appendix 7.

5.6.2.2 Operationalisation of dependent and independent variables

In Section C, a five-point Likert Scale was used to assess the students' overall attitude towards the CAS and their satisfaction or dissatisfaction with the service. The Likert scale is a multiple indicator, commonly used in social research for investigating attitudes (Bryman, 2015:154). It included: 1 (*strongly disagree*), 2 (*disagree*), 3 (*neutral*), 4 (*agree*) and 5 (*strongly agree*). The instrument was designed with dependent and independent variables or concepts. Bryman (2015:152) advises that in order to provide a measure of concepts the researcher has to ensure that an indicator or indicators are representative of that concept, concepts being categories of organised ideas as well as observations (Bryman, 2015:151). They may be characterised as dependent or independent variables. The dependent variable D1 (on the questionnaire) is operationalised as a preference for the CAS model. The researcher used a series of questions to operationalise concepts such as efficiency and effectiveness as independent variables. The concept of efficiency is represented by ten independent variables, C1 to C10. To reiterate, the CAS efficiency means optimising students' satisfaction through conveniently available

information and timeous responses, mainly through an online platform. The concept of effectiveness is represented by the eight variables, C11 to C18 (see Appendix 7). CAS effectiveness means the provision of quality service enabling the meeting of targets, and gaining information through high quality, consistent and reliable data (Blasch, Valin & Bosse, 2010:1; Stewart-Weeks, 2015:73). All 18 variables were drawn from the respective definitions of each concept: efficiency and effectiveness. The design of the survey instrument was guided by the research problem and second research objective, i.e., to identify the factors that facilitate or hinder efficiency and effectiveness in the application process. The instrument was set up to measure the concepts of efficiency and effectiveness as per the hypothesis about whether the CAS model would bring about efficiency and effectiveness in the application process. In addition, the researcher tried to create synergy between the conceptual framework and the questionnaire design.

The language of instruction at both DUT and UKZN was English, therefore, the questionnaire was developed in English with no translation necessary. Fieldworkers assisted the researcher with distribution and collection of consent forms and questionnaires. The home language of each participant could not be determined using stratified random sampling, therefore the researcher used English, the language of learner instruction at the sample universities. The researcher trained and supervised the fieldworkers. The training involved informing them who to recruit (level of study of the student at DUT and UKZN respectively). Including how to advise the participants volunteering to participate in the study what is detailed in the consent form attached in Appendix 8 and all ethical considerations as outlined in section 5.10. The questionnaire was completed in approximately 20 minutes, and was distributed to first and second year undergraduate students. The researcher only used closed questions as they can be completed quickly and be easily coded, yielding a better response rate as Bryman (2012) advises. There were 150 surveys distributed to student respondents at DUT and 150 at UKZN. Of the 300 surveys distributed, 287 completed surveys were returned, a total of 140 from DUT and 147 from UKZN. The next section discusses the data analysis.

5.7 Data Analysis

This section of the study details the processes and procedures that were followed to analyse the data presented in Chapters Six, Seven and Eight. Yin (2009a:127) asserts that the analysis of case study evidence is one of the most difficult aspects of conducting a case study, as there are no fixed formulas or guides to help. Different data analysis techniques are used for qualitative and

quantitative data; the analysis for qualitative data is detailed in section 5.7.1, subsections 5.7.1.1 to 5.7.1.4, and the quantitative data is discussed in Section 5.7.2.

5.7.1 Qualitative data analysis techniques

Transcripts were generated from the interviews, group interview and focus groups. The researcher undertook an extensive data reduction exercise using transcripts, for example, assigning codes to each respondent to preserve anonymity and to identify which response was coming from the CAO and which from DUT or UKZN. The researcher then copied and pasted all interviewee responses to a particular interview question into a single document, manually using colour-coded markers to begin to unpack similarities and dissimilarities of responses. The researcher applied a similar process for reducing data from the group interview and the focus group, except that analysis of focus group data extended into conversation analysis. The researcher also designed the Table in Appendix 9 to project which data adduced by which interview question would likely respond to which research question and objective. The respondent coding technique was used for analysis of the data into categories and subcategories, while thematic and content analyses were employed to interpret the qualitative data. Appendices 11 to 14 show the data reduction process. Excerpts from different transcripts were reduced while preserving the voice of respondents. Categories and subcategories emerged from the reduced data. Themes were then developed from the data categories using matrices, which will be discussed prior to the data analysis of all the qualitative data sets in Chapter Eight. The terms ‘content’ and ‘thematic’ analysis are sometimes used interchangeably, however, as Vaismoradi, Turunen & Bondas (2013:400) indicate, the meanings differ, as detailed in the upcoming sections. Conversation analysis was used for the focus group data. These differences will be detailed in the upcoming sections, starting with content analysis followed by matrix analysis and then thematic analysis. The researcher also used document analysis, which was further modelled in the triangulation of all data sets in Chapter Eight. Ultimately, the researcher highlighted the comparison of the outcomes from multiple data sets to determine if the findings confirmed or disconfirmed each other (Creswell, 2009:213). The next section outlines the use of content analysis as an approach to data analysis.

5.7.1.1 Content analysis

Vaismoradi *et al.*, (2013:400) define content analysis as “a systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication.” This type of analysis is an interpretation of the data from text to understand content and provide better context from the interviews. Descriptive, interpretative,

pattern and reflective codes were used during the coding process, and codes with similar meanings sorted into sub-categories. The researcher had the background to provide the context and subsequent interpretation but although engaging an individual to transcribe the audio recordings a reiterative process was followed of continuously reverting to listen to audio tapes and comparing the transcripts with the audio recordings. This helped jar the researcher's memory to retain the context of interviews and focus groups while interpreting data. All data sets were reduced, and categories indicated for further analysis. The responses of the participants were classified into different categories and sub-categories, as informed by the established conceptual framework generated during the reviewed literature (Bazeley, 2009:9) and the research questions. The relationship between the sub-categories were subsequently combined into a smaller number of categories, from which themes emerged. Organising raw data into concepts and themes, and developing concept definitions while assessing the contrasting relationships from different concepts from transcripts and field notes enhanced validity. The subsequent step was to group together the responses into categories dealing with common themes and analysis of data as the data analysis process unfolded, aligning them to the research questions and objectives.

Analysis of the group interview was consistent with the interviews and the focus groups, with data reduced to smaller units and coded and categories emerging from the data set (Bazeley, 2009:9). The researcher also modelled the input-output-outcomes from the service that the CAO offered, indicative of the conceptual framework of the study in Chapter Two. Doody *et al.*, (2013:266) argue that analysis of focus group data is a complex and ambiguous process, which involves the ability of the researcher to be creative and bring order to the chaotic data collected. To uncover meaning from the data involves many steps. Notably, Onwuegbuzie *et al.* (2010:713) maintain that just using counts can be misleading because it is not enough simply to count how many people were in consensus, as their viewpoints and their expressions cannot be silenced by counts. Counts should thus be combined with interpretation to create richer results and findings. Therefore, qualitative data was displayed using matrices, which is discussed next. Therefore, qualitative data were displayed using matrices, which is discussed next.

5.7.1.2 Matrix analysis

All qualitative data was eventually displayed in matrices which were used to draw findings and conclusions from the data gathered from the in-depth interviews, group interview and focus group interviews. Matrices are useful in the facilitation and comparative analysis of data, presenting logical conclusions and detecting patterns in data (Bazeley, 2009:9, Onwuegbuzie *et al.*, 2009:12). The matrices were further used to disaggregate the data, which assisted in the

aggregation of data to categories and themes. This process assisted with the emerging themes from all data sources, to be discussed in the thematic analysis below.

The focus group data was reduced to smaller units, with categories created and analysed. Following this sequence, conversation analysis was used for both the DUT and UKZN focus groups. Onwuegbuzie *et al.* (2009:12), define conversation analysis as “examining the procedures used in the production of ordinary conversation,” while Pour and Yazd (2015:58) advise that it be used to study both verbal and non-verbal social interactions in the daily lives of participants, focusing on conversations in work places and organisations. Turn taking in conversation analysis was also noted within the context of group interaction (Pour & Yazd, 2015:58) during the focus group interviews. Accordingly, Onwuegbuzie *et al.*, (2009:5) indicate that for qualitative rigour using only text to provide themes in the analysis of focus groups can be limiting as there is no opportunity to provide information about consenting or dissenting views. This may result in those who dissent or who are outliers being marginalised. Conversation analysis enabled a deeper understanding of the phenomenon and the researcher used it for both focus groups to gauge the participants’ understanding of the CAS.

5.7.1.3 Thematic analysis

Thematic analysis can be used for both the analysis of data and reporting of patterns or themes (Vaismoradi *et al.*, 2013:400). For Bazeley (2009:9), themes can only attain full significance when linked to form a coordinated picture or an explanatory model. Thematic analysis was used by analysing the categories and themes that emerged from the interviews, group interview and focus group interviews. Themes were integrated into a purposeful, comprehensive analysis (Bazeley, 2009:8), subsequently used to build a series of findings, conclusions and recommendations to be discussed in Chapters Eight and Nine.

5.7.1.4 Document analysis

Bowen (2009:1) defines document analysis as “a systematic procedure for reviewing or evaluating documents both printed and electronic (computer-based and internet-transmitted) material”. Put simply, document analysis refers to a procedure where the researcher reviews and evaluates documents. It refers to a procedure in which the researcher reviews and evaluates documents. Bowen (2009:28) further advises that it can be used together with other research methods as a way of triangulating, but as there is value in text Denzin and Lincoln (1998:127) warned that the material may not have the author to defend what is actually interpreted. The muted voices thus put the interpretation of the material under pressure.

In order to obtain a broader understanding and to contextualise the data from the in-depth interviews, group interview and focus group interviews, the researcher referenced, validated and verified the information using several reports, as stipulated in Section 6.5 on the organisation of the secondary data. These documents were analysed using content analysis as discussed above and drawn upon as another source of evidence to establish convergence and corroboration or the lack thereof by using different data sources and methods. Bowen (2009:29) indicates that documents can serve many different purposes as part of the research undertaking., hence, documents were examined in relation to the results of the in-depth interviews discussed in subsection 5.6.1.1, the group interviews in subsection 5.6.1.2 and finally the focus group interviews in subsection 5.6.1.3. The next section is on quantitative data analysis.

5.7.2 Quantitative data analysis

To conduct the quantitative data analysis, the researcher followed a process of comparing statistical packages and their usefulness and limitations (Acock, 2005:1092-1095). Three types of software packages that are dominant tools for statistical analysis and data management are Statistical Analysis System (SAS), Stata, and Statistical Package for the Social Sciences (SPSS), each of which has its advantages and disadvantages, with no single particular type sufficient for all the data management and standard analysis (Acock, 2005:1093. According to Weaver and Wuensch (2013:2), in some cases analysts may use different programmes to perform the desired tests, although these can be difficult to use and so may not provide all of the desired outputs. For this study, the researcher ultimately used Stata *11.0*.

The number of individuals with each characteristic, such as campus and gender, were calculated using the tabulate command of, and the means, medians and standard deviations of continuous variables were assessed using the summarise command of Stata *11.0*. Histogram graphs were constructed using Microsoft Excel 2010 to show the distribution of various variables and the Chi-square test used to assess any associations between variables using the tab, chi command Stata *11.0*. As Howell (2011:1) advises, the Pearson-chi test “serves both as a ‘goodness of-fit’ test, where the data are categorized along one dimension, and as a test for the more common ‘contingency Table’, in which categorization is across two or more dimensions.” Regression analysis is an important statistical analysis that assists, amongst others, with the identification and classification of relationships (Schneider, Hommel & Blettner, 2010:1). Linear regression was used to test for any associations between the continuous variables and the number of applications made by each student. Univariate logistic regression was used to assess whether CAS was a fit model to use for application for admission to higher institutions of learning.

Bryman (2012:347) indicates that statistical significance is solely the confidence a researcher has in the findings, a process of inferring findings from the probability sample to the general population. All variables with a P-value of 0.05 or less in the univariate analysis were included in the final multivariate analysis. All variables with a P-value of 0.05 in the multivariate analysis were consequently considered to be statistically significant to influence the use of CAS as a fit model for applications for admission to a higher institution. The “tabulate, col row” command of Stata 11.0 was applied to variable D1 to establish how many students stratified by institution of learning agreed or disagreed that CAS is an efficient and effective system when applying for a place at an institution of higher learning in South Africa.

The connection of how the above interpretation assisted in testing the hypotheses and obtaining the research objectives was contained in two predicted causal relationships. First was the questioned causal relationship between the dependent variable D1 (preference for the CAS model) and independent variables for efficiency, exhibited by C1-C10. Second was the proposed causal relationship between the dependent variable D1 and independent variables for effectiveness as shown by C11-C18. The dependent and independent variables are shown in Appendix 7 on the survey questionnaire.

The purpose of data quality control is to help link data collection and data analysis in a way that facilitates rigour of the study (Brooks & Nomore, 2015:803). The aspects of rigorous research that enable the reliability and validity of data and findings are dealt with differently in qualitative as opposed to quantitative studies (Bryman, 2015:384; Creswell, 2014:201). According to Creswell (2014:201), qualitative validity means that the researcher ensures the accuracy of findings by using certain well-structured research design, data collection and analysis procedures, while qualitative reliability indicates consistency in the approaches that the researcher has undertaken. In contrast to qualitative validity, quantitative validity refers to the extent to which an instrument measures what it is supposed to measure (Tavakol & Dennick, 2011:54). According to Drost (2011:106), quantitative reliability is the extent to which results are repeatable when different people perform the same measurement. The next section of the study details the qualitative data quality control, starting with data quality control for the qualitative part of the study followed by the quantitative data quality control.

5.8 Data Quality Control

Data quality control is measured differently in qualitative and quantitative research. Section 5.8.1 will cover data quality control for qualitative research, while section 5.8.2 will cover data quality control for quantitative research.

5.8.1 Data quality control for qualitative research

According to Guba and Lincoln (1998) as cited in Bryman (2015:384), there are two overarching criteria proposed for evaluating qualitative research, trustworthiness and authenticity. A belief from a qualitative research perspective is that social scientists could not reveal one absolute truth about the social world. This awareness of multiple truths takes into account the epistemological paradigms of post-positivism and constructivism underlying this study (see Section 5.2). On one hand, Tracy (2010:841) refers to notions of authenticity by the word ‘sincerity,’ meaning the researcher’s “self-reflexivity, vulnerability, honesty, and transparency throughout and after the qualitative research experience. Researcher vulnerability and honesty are part of self-reflexive practice, whereby the researcher is concerned with negotiating access and trust, data collection, analysis, and presentation (Modell, 2015:1141; Tracy, 2010:842). This means being conscious of bridging respondent relationships in the field and being aware of one’s own predilections while striving to set them aside in preference of honestly interpreting feedback from respondents (Tracy, 2010:842). Transparency encompasses “how the researcher got into the context, the level of participation and immersion, field note practices, and level of detail in transcription” (Tracy, 2010:842). On the one hand, the researcher began self-reflection long before registering for a qualification and undertaking this research, and therefore was upfront with the participants about personal involvement in HE, stressing this would not influence the research process. On the other hand, trustworthiness of the data from the perspective of the researcher, the participants and the audience of the study is likewise a facet of qualitative data control (Creswell, 2009:191). For Bryman (2015:385), there are four criteria of trustworthiness, discussion of which follows.

5.8.1.1 Credibility

Credibility refers to the confidence of the degree of truth placed in the research findings (Anney, 2014:276), such that the researcher conducts the investigation in a way that increases the likelihood of the findings being credible. According to Anney (2014:276), credibility is established if the findings are representative of the information that is drawn, and a correct interpretation of the view is expressed by participants from the original data, suggesting the following strategies. One way of establishing credibility in qualitative research is the use of

triangulation, whereby the multiple realities of participants are presented as obtained from different data collection methods. The extent to which findings from different data collection modes converge lends credibility to the findings. In the qualitative aspects of the study, the primary data included four in-depth semi-structured interviews, a group interview, and two focus groups, all across the two universities. As secondary data, documentary evidence was another source with survey results providing the quantitative component (Anney, 2014:277; Bryman 2015:390). Findings from these multiple sources of evidence are triangulated in section 8.5 in chapter Eight.

Another strategy used to enhance the study's credibility is negative data analysis. The data that did not seem to fit within a particular emerging category, pattern or theme was also identified so as not to be silenced. Identifying such data enabled the researcher not only to learn more about it but to also render explanations about why it could not be fitted into the available categories. This was also an attempt to ensure that these outlying views were not silenced, as they might be critical for future studies or require further investigation (Onwuegbuzie *et al.*, 2010:696). According to Anney (2014:277), when outliers occur during a study, "the researcher is required to conduct negative case analysis of the cases emerging from the study." When a researcher reports negative cases or dissenting perceptions it enhances and improves the credibility of the study. This contradiction emerging from the data could give an alternative and plausible unexpected explanation (Bazeley, 2009:12). Confirmability is next discussed.

5.8.1.2 Confirmability

Confirmability refers to the degree to which the results of an inquiry are an accurate representation of the interpretation that the participants provided and were not invented or created by the researcher (Elo, Kääriäinen, Kanste, Pölkki, Utriainen & Kyngäs 2014:6). The researcher did not send the data back to the respondents but did attend study workshops facilitated by the study supervisor during which transcripts were interrogated, and emerging meanings from participant constructions were contested. For example, to confirm the credibility of the findings coming from data reduction the promoter would require the researcher return to the transcripts and audio-recordings to confirm that the meanings delivered by the participants had been conveyed in the correct context. In addition, the researcher undertook a long and intense process of creating matrices across various stages of data reduction. During this phase, the researcher checked and re-checked excerpts from transcripts against emerging categories and constructions of reality about the CAS. The researcher was careful to preserve the voice of staff who delivered the

services (CAO) and staff at DUT and UKZN who used the CAS (see Appendices 11 – 14). Dependability is discussed next.

5.8.1.3 Dependability

As another criterion of trustworthiness, dependability can be achieved through an ‘audit trail’ of the account of fieldwork activity (Bryman, 2015:385). In this regard, the researcher conducted an audit trail of data in a number of ways during the fieldwork, including continual updates to a dissertation journal recording occurrences in the field and factors that arose during data analysis. In addition, the researcher maintained electronic files on transcripts, field notes and audio-recordings and the continual construction of Appendices 11 – 14. Other aspects of the audit trail included email communications to track the researcher’s interactions with respondents, such as scheduling appointments and requesting and providing information, written requests and responses regarding the nature of the secondary data being collected and codified, and the management of incoming information. The researcher also engaged in training and oversight of two research assistants, one at DUT and one at UKZN, to ensure dependability of tracking the way in which surveys were disseminated and collected.

Dependability is tantamount to replicability or repeatability in different situations and at different times (Elo *et al.*, 2014:4; Wahyuni, 2012:77). In this regard, the researcher detailed the occurrences systematically related to the research and selected the type of participants who would contribute to the study outcomes, carefully planning and observing consistent data collection methods and procedures. A final criterion often associated with the trustworthiness of qualitative studies is transferability, discussed next.

5.8.1.4 Transferability

Anney (2014:277) defines transferability as “the degree to which the results of qualitative research can be transferred to other contexts with other respondents – it is the interpretive equivalent of generalizability.” It is for the reader or potential user to determine whether findings from a study can be transferred to similarly situated contexts but for this determination to be made a qualitative study should include a thick description of research methodology to provide an understanding of how the study was undertaken, as well as a thick description of the data presentation and analysis. Bazeley (2009:9) points out that a thick description is a valuable component of a study, but description alone is insufficient. In this study, thick description was used to detail the research design, data collection and analysis techniques, as well as sampling strategies employed by the study. For example, the researcher used purposive sampling in an effort to add rigour, as the

participants were knowledgeable about the application processes, in particular the operation of the CAS (Anney, 2014:276). Moreover, a thick description was provided through comprehensive and elaborative information on the CAS application process at both DUT and UKZN by secondary and primary data, as shown in Chapter Six. During the data analysis process, the categories were descriptive, specifying in detail the opinions of the participants and in this exploratory case study the researcher tried to provide sufficient descriptions to ensure that the findings could be understood.

Beyond thick description, the researcher attempted to integrate the qualitative data results with the quantitative data results to offer explanations about whether the CAS model is fit for DUT and UKZN in terms of application management. Data quality control for quantitative research is discussed next.

5.8.2 Data quality control for quantitative research

In quantitative studies, both reliability and validity figure prominently in data quality control. According to Heale & Twycross (2015:66), in quantitative research rigour is achieved through the measurement of reliability and validity. A measure can be reliable but not valid, however consistency and accuracy increase the ability to enhance the generalizability of the findings and ensure that results can be replicated. The threats of reliability and validity are controlled by the consistency in the measure of concepts and clarity in the steps that the researcher followed (Drost, 2011:107; Nardi, 2015:61). Reliability is discussed first in Section 5.8.2.1, followed by validity in Section 5.8.2.2.

5.8.2.1 Reliability

Drost (2011:106) indicates that reliability is “the extent to which measurements are repeatable if performed under different circumstances, occasions and conditions by different people,” while Bryman (2015:157) defines it as “the consistency of a measure of concept.” Drost (2011:107) argues that the four methods of testing reliability are: (1) test-retest, (2) split-halves, (3) inter-rater reliability, and (4) internal consistency. Internal consistency measures the degree of interrelatedness of measurement items that are designed to measure the same concept (Tavakol & Dennick, 2011:56). The constancy of measures of concept has three factors to be considered, the first of which is stability (whether the measure is stable over time). In this aspect, little variation is expected, i.e., if the survey has to be administered again the results will not be different. The second factor is internal reliability (indicator consistency), while the third is inter-rater reliability (data translation or subjective judgement) (Bryman, 2015:157; Drost, 2011:111;

Heale & Twycross, 2015:66). Validity in the context of quantitative research is discussed in detail in the next section.

5.8.2.2 Validity

Heale & Twycross (2015:66) define validity “as the extent to which a concept is accurately measured, and reliability is the accuracy of an instrument used.” It is mainly concerned with whether the indicator or set of indicators used to gauge the concept measures that concept. Drost (2011:106 -118) and Heale and Twycross (2015:66) indicate that there are several types of validity, namely, construct validity, translation, and content validity. Construct validity is whether conclusions or inferences can be drawn from the results, translation is if the operationalization is reflective of the meaning of that construct, and content validity if a survey instrument adequately covers the domain that is related to the construct. The question arises, are the variables represented in the efficiency (C1- C10) and effectiveness (C11- C18) of the CAS sufficient to measure the concepts that they should measure (Drost, 2011:106-118; Heale & Twycross, 2015:66-67). The manner in which efficiency and effectiveness are operationalised is explained in section 5.6.2.2. For this study, these concepts that were good indicators of what the researcher was measuring as they were derived from the stated hypotheses, which specified the relationship between the variables (Nardi, 2015:61). The test of the hypotheses in the CAS study is indicated in Section 7.1.6 on Presentation and Analysis of Quantitative Data. All variables with a P-value of 0.05 or less in the univariate analysis were included in the final multivariate analysis. All variables with a P-value of 0.05 in the multivariate analysis were consequently considered to be statistically significant to influence the use of CAS as a fit model application for admission to higher institutions.

5.9 Diverse types of Triangulation

In this section the researcher discusses triangulation in relation to the CAS study. For Archibald (2016:260), triangulation has come to mean many things over its history of existence. Bazeley (2009:10) defines triangulation as “seeking convergence and corroboration of results from different methods.” In addition, Venkatesh *et al.*, (2013:25) asserts that through triangulation a researcher may find diverging or complementing views which may improve understanding of a phenomenon being explored. The classical way of limiting triangulation to the process of just enhancing trustworthiness and validity in the research process has been updated (Archibald 2016:229; Balaban & Portsmouth, 2015:2). Triangulation can be used as a way of generating diverging, converging viewpoints, interpretations and perspectives in a research study (Berger,

2013:229; Balaban & Portsmouth 2015:4). There were three types of triangulation used in this study; namely paradigmatic, methodological and theoretical. In section 5.9.1 paradigmatic triangulation is first discussed, followed by methodological triangulation in 5.9.2 and finally, in section 5.9.3 theoretical triangulation is explored.

5.9.1 Paradigmatic Triangulation

According to Archibald (2016:244) paradigmatic triangulation can occur without the violation of beliefs or stances of another person. Lincoln, Lynham, & Guba (2011:169) suggest that the researchers' values feed into the inquiry process. These values cannot be excluded from the choices that the researcher makes such as research problem, paradigm, theoretical framework, data collection and analysis, presentation and interpretation of the findings and so forth (Lincoln *et al.*, 2011:169). Involving a pragmatic process of drawing perspectives to generate understandings and explanations from empirical inquiry, this study embraced, post-positivist, pragmatist and constructivist philosophical worldviews (see Table 5.1). Use of paradigmatic triangulation is justifiable since this study aimed to deliver recommendations on the submission of policies for the PSET-CAS from the varied worldviews held by these policy makers. Section 8.6 shows how the researcher applied these philosophical underpinnings to set recommendations to the DHET on the implementation of the PSET-CAS. The idea is to give results that are acceptable and can be used for further reference in future studies since multiple philosophical worldviews are applied (Khan 2014:299). The use of methodological triangulation is discussed in the next section.

5.9.2 Methodological Triangulation

As indicated section 5.3, this is a mixed method study. The methodological triangulation of the qualitative primary, qualitative secondary and quantitative primary data demonstrates how the findings from the different data collection and data analysis methods helped the researcher to achieve the objectives and answer the research questions (Fusch & Ness, 2015:1141). These are stated in section 1.4 and also recapitulated in section section 9.2. With triangulation, researchers can reach the ultimate goal of increasing internal and external validity (Thurmond, 2001: 253). On the account of integrating, this mixed method study revealed different perspectives derived from various data collection methods such as semi-structure interviews, focus groups and a group interview, giving a more rounded and nuanced picture of the CAS rather than a single method would. In addition, a student survey shows use of a different method. Stata 11.0 results from the surveys revealed a number of statistically significant relationships between the dependent and independent variables that influenced the use of CAS.

Hence, the study captures both staff and students' perspectives at the DUT and the UKZN through different methods (Torrance, 2012: 113-114). Findings from the data were then compared through cross-unit comparative analysis and methodological triangulation in Chapter Eight, section 8.5 to vet the rigor, discover challenges of the CAS model. Furthermore, through methodological triangulation the researcher was able to determine the factors that hinder or facilitate efficiency and effectiveness, and subsequently the fitness of the CAS for both DUT and UKZN. Theoretical triangulation is discussed next.

5.9.3 Theoretical Triangulation

According to Pitre & Kushner (2015:289) “theoretical triangulation draws on alternative theories as analytical frameworks to explore different facets of viewpoints about research phenomena.” Fusch, *et al.*, (2018:22) advise that theoretical triangulation can also enable raw data speak to the researcher to ascertain a new theory. The use of the varied Public Administration theories such as those on efficiency and effectiveness (Blasch, Valin & Bosse 2010:1; Førsund, 2013a:4-10), systems thinking approach (Arnold and Wade 2015: 675; Whitney *et al.*, 2015:20), network management and network governance (Klijn & Koppenjan 2012:594; O'Toole 2015:362) is crucial for a number of reasons. According to Capano (2011:1623), “governance refers to the possible ways in which policy actors combine to solve collective problems and thus to the ways in which the policy-making process is steered.” The HE sector needs an all-encompassing approach in successfully implementing the PSET-CAS. Challenges with navigating access to HE presented in Chapter Two, complexities of the application processes discussed in Chapter Three can be addressed through co-operation, co-ordination and consideration of the varied Public Administration theories. These theories allowed the study to be deepened and directed to yield the meta-theoretical framework, presented in figure 4.7. and subsequently triangulated in section 8.7. The DHET can, in light of the research findings presented in the final chapter, section 9.6 draw upon policy implications to help HEIs succeed with an informed use of the PSET-CAS for admissions processes in South Africa.

The ethical considerations of this study are discussed next.

5.10 Ethical Considerations

Ethics in research require adherence to certain norms that guide the research process and the values to which a researcher must adhere when working with participants and data. They further require the exercise of professionalism and high moral behaviour of the researcher during the research process (Bryman, 2012:130). According to Spicker (2011:133), researchers “should

behave towards research participants with integrity – that is, their actions should be consistent with the principles they affirm.” Self-reflexivity is just as important in terms of the sincerity and authenticity of the researcher as it is for ethical considerations, and applies to all aspects of study, including data collection, data analysis and data quality control.

Approval of ethics was granted by the Humanities and Social Science and Research Ethics Commission on 16 August 2018, (see Appendix 15), with a firm commitment from DUT, UKZN and the CAO that the research could be conducted on site. Following the granting of the ethical clearance and authorisation to proceed, interviews, a group interview and focus groups were conducted amongst staff at the two universities and the CAO. Consent forms were completed prior to the use of any data collection tools (Creswell, 2014:190; Newman, 2011:528), however, before dissemination of the consent forms, all participants were briefed about the study. As Spicker (2011:133) notes, “research subjects have the right to be informed about research, to consent, or to withdraw from it if they are not content.” The consent form for interviews is attached as Appendix 2, the consent form for the group interview as Appendix 4, the form for the focus groups as Appendix 6, and the form for surveys as Appendix 8. The signed consent forms are retained by UKZN for five years.

A cover letter was included with the consent forms, requesting respondents’ consent to participate and to explain the aim of the study. The letter also solicited co-operation from participants by informing them that their participation in this project was completely voluntary and that they could refuse to participate or withdraw from the project at any time with no negative consequence. Participants were further assured of confidentiality and anonymity (Newman, 2011:528; Spicker, 2011:133). No monetary gain was attached to participating in this research project. These same ethical procedures were followed for the collection of both qualitative and quantitative data.

Marshall and Rossman (2014:28) point out that researchers have a challenge to demonstrate that their interests will not bias the study findings, thus the researcher continued to follow ethical procedures during the data analysis. The researcher also had the obligation to inform the participants about personal identity and professional affiliations. According to Creswell (2009, 2013, 2014), the researcher’s background, history, and prior understanding cannot be separated from interpretation of the data. The researcher thus examined inherent biases, which may have existed as an HE administrator conducting a study on application processes (Marshall & Rossman, 2014:28). The researcher had to reflect and identify any possible biases based on values and personal background during the research process. Particularly during the process of data analysis, as categories and themes emerged, the researcher was careful to self-analyse and cast aside any

pre-existing expectations that may affect the outcomes of the study (Onwuegbuzie *et al.*, 2010:696). Limitations are next discussed.

5.11 Limitations of the Study

As with any study, there were a number of limitations associated with this study. The first raised the issue about bias as discussed in connection with the ethical considerations. Given that the researcher was employed in the HE sector as Deputy Register at a South African university, the researcher had to guard against bias and take precautions to sustain objectivity (Marshall & Rossman, 2014:28). The researcher was able to avoid bias by conducting research at universities where not employed and by using consistent data collection and analysis procedures.

Another limitation of the study could be that the respondents were not forthcoming with providing the information sought, however the researcher assured them that part of the research process included protecting human subjects. The researcher tried to make the staff members comfortable enough to share information and explained that there were no right or wrong answers, just an effort to research and hopefully come up with empirical evidence that could improve the HE application process. The researcher let it be known that there was no personal vested interest in the study, and that their own constructions of the implementation of the CAS could assist with enhancing the application process.

Another limitation was that this study selected two institutions in KZN to participate, whereas there are more post education institutions in KZN that use the CAS. It could be limiting to measure the efficiency and effectiveness of the CAS from the perspectives of staff and students at only two universities. Ideally, the researcher would have preferred to stretch the study and include a component of TVET colleges and private institutions. The researcher could also have included other countries in which the CAS approach for applications is used. This would have provided a broader picture of how this service is viewed by international users. In Europe, for example, they have been using the UCAS system for decades (Bethell & Zabulionis, 2014:26; Boliver, 2013:344; Clark & Brown, 2008:84), however, the researcher was advised by the supervisor to limit the study to two comparable universities in which the CAS model was operational (Creswell, 2014).

The outcome of this study is primarily intended for informing the South African HE landscape on the applications process. However, because of its limited of scope, the study might not give a

complete picture about the implementation of the CAS. This is particularly the case since 298 students were surveyed, meaning that the findings based on the students' perceptions may not be generalizable to other student populations in KZN. Despite all these challenges, this study remains important as it can serve as a platform for wider future analysis on the CAS model.

5.12 Chapter Summary

This study on the CAS was conducted as a single-embedded case study and grounded in post-positivist, constructivist and pragmatism paradigm principles. The methodology followed was a mixed method approach, which used the strengths from both the qualitative and quantitative methods to minimise any shortcomings. The qualitative approach was selected because it allowed an in-depth probing of participants in order to understand the phenomenon under study. The quantitative approach complemented the qualitative approach by enhancing the accuracy of results through detailed statistical analysis, with the added advantage of minimising the element of subjectivity associated with the qualitative approach. The mixed method approach resulted in the collection and triangulation of rich data sets to yield findings that address the research problem. The research methodology applied suited this particular study, as it enabled the researcher to answer the research questions and meet the study objectives as demonstrated in subsequent chapters. This chapter further outlined the research paradigm and justification for selection, the research strategy, the sampling strategies, data collection, the analysis procedures, data quality control, ethical considerations and limitations. The next chapter presents an analysis of data and findings that emanated from the study.

CHAPTER SIX: QUALITATIVE DATA PRESENTATION AND ANALYSIS

6.1 Introduction

The literature review in Chapter Two and Three described the critical challenges facing the admission of undergraduate students to HEIs, while Chapter Four provided details theoretical approaches necessary to answer the research questions and ensure that the objectives of the study are met. The methodological approaches as well as the meta-theoretical framework that informs capturing the opinions, experiences, views and perceptions of the users of the CAO at both DUT and UKZN. This section will then provide an analysis of the qualitative data, followed by a presentation of the quantitative findings. The findings of the study are presented in line with the mixed method methodology outlined in the preceding chapter.

This chapter will provide the case context of the CAS. Yin (2013:321) advises that the complexity of a single case study mean that it is important to have a sound understanding of the case. To do this, the case (CAS) should be examined within its context. This section will thus briefly provide the contextualization of CAS, looking at the CAO operations and the use of the CAS by both DUT and UKZN. Categories and subcategories were determined and grouped to form bigger emerging themes for intensive analysis. The chapter ends with a brief summary of its contents.

6.2 The Central Applications Office

The CAO is a non-governmental organisation, which provides CAS functionality to some institutions in KZN. It should be noted that this study is about the system not the organisation; both universities provide the context for how the system operates through CAO. The CAO abides by a certain vision; mission and values were being set forth next.

6.2.1 Vision

“Our vision is to be a world class centralised applications service offering access to the fullest range of study opportunities in Higher Education and Further Educations in Southern Africa” (CAO 2009)

6.2.2 Mission

“Helping turn career dreams into reality” (CAO 2009).

6.2.3 Values

According to the CAO Annual Report 2014/2015, the following are the values of the CAO

The CAO pledges to:

- Provide the highest standards of service;
- Be professional, empathetic and sensitive to customer needs and challenges;
- Promote strong team synergy, mutual support and a friendly atmosphere to work in,
- Be accessible and resource-driven to meet our customer needs;
- Facilitate the dissemination of information to customers, thereby assisting them to make informed decisions;
- Ensure good governance through management support and inclusive participation, accountability and responsiveness to our customer needs;
- Acknowledge the input and relationships with key partnership in driving the success of post-school education; and

Encouraging internal growth and development amongst all employees (CAO Annual Report 2014/2015:3)

The next section discusses the CAO's organisational structure to indicate how the CAS is put into context.

6.2.4 Central Applications Office organisational structure

Figure 6.1 provides information about how the organisation operates, indicating the different divisions and departments.

Organogram

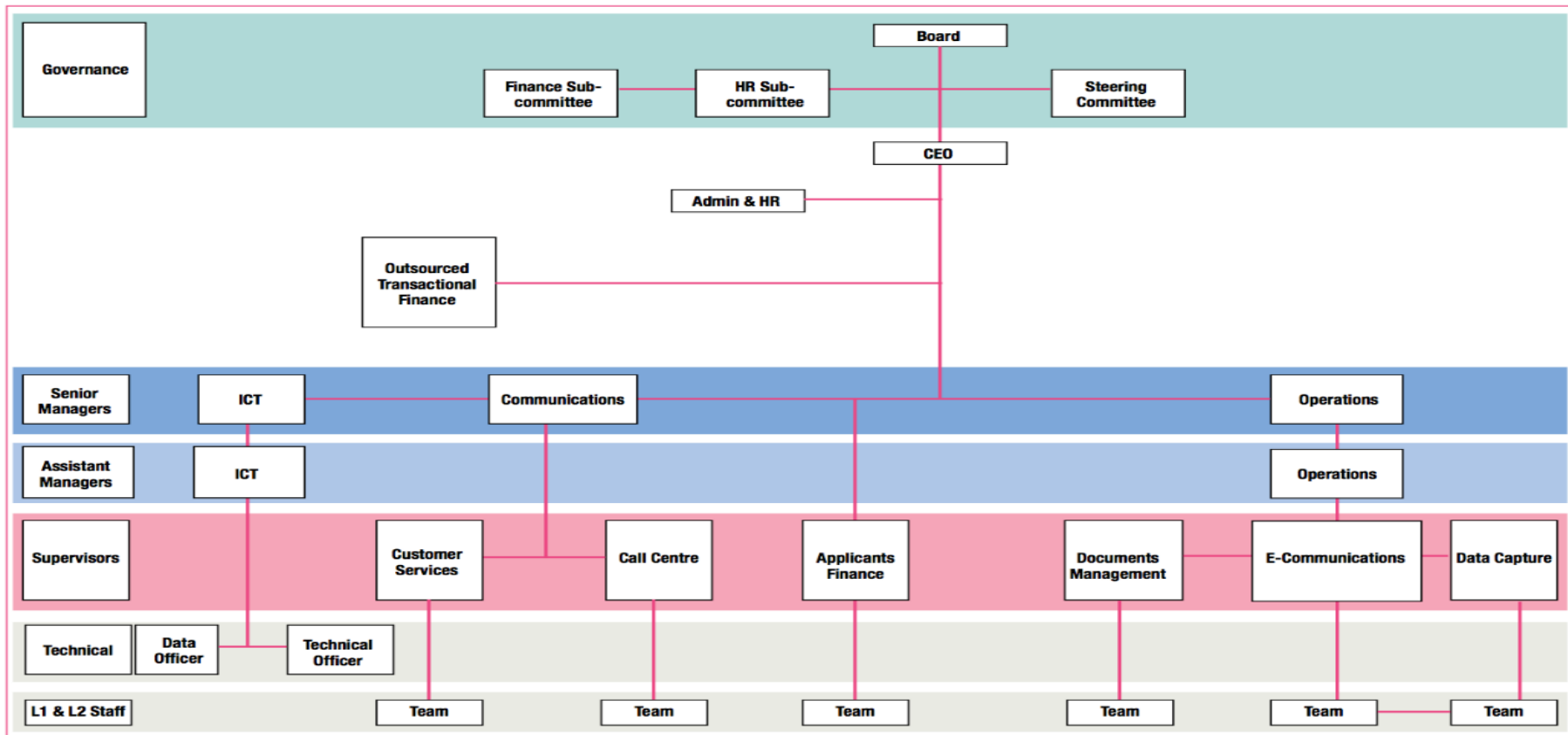


Figure 6-1: CAO Organogram

Source: CAO Annual Report (2014/2015:5)

Figure 6.1 as the organogram that underlies the life cycle of the application process that the CAO follows. Figure 6.2 on overleaf, depicts the life cycle of an application. This process formed part of the secondary data that allowed comparison between documentary evidence and interview findings.

Life Cycle of An Application

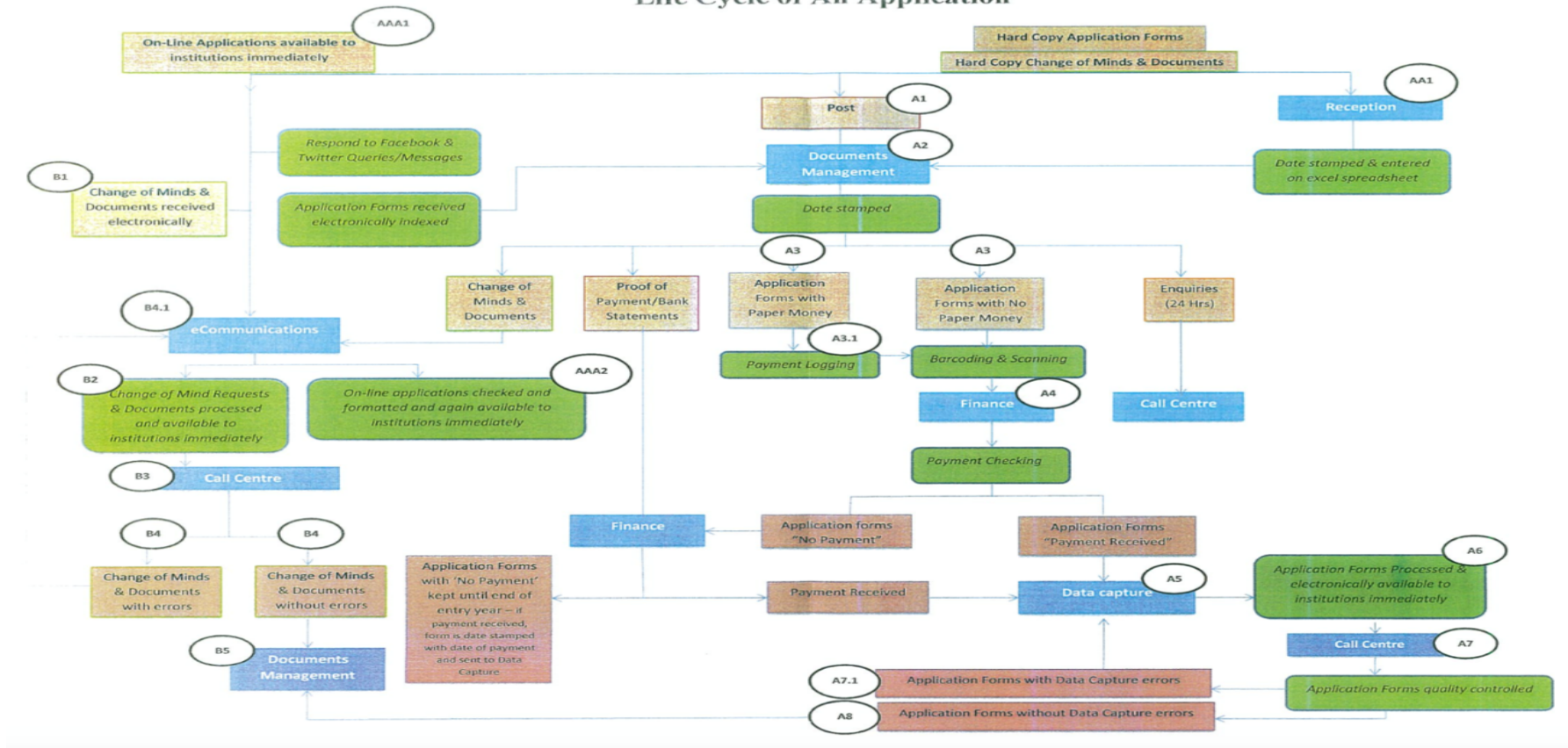


Figure 6-2: CAO Applications cycle

Source: CAO Information pamphlet provided to the researcher by the CAO, 20/09/201

The CAO staff and the way in which CAO staff handle applications helps show the way in which the CAO works with HEIs. In addition these diagrams shed light on how CAO staff and university staff and students drive the CAS.

As pointed out in chapter three, the case under study is the CAS and the embedded units of analysis are the CAO employees, as well as staff and students at DUT and UKZN. The next section gives an overview and context for DUT, including the organisation's vision, mission and values. This section will also give details about both staff and student information.

6.3 Context of the Durban University of Technology

This section presents the context of DUT in terms of its vision, mission, values and staff and student information. Six campuses comprise DUT. Four campuses situated in Durban and two in Pietermaritzburg. The vision, mission and values of DUT are extracted from the Strategic Plan 2015- 2019 document and are discussed next (DUT 2015:6).

6.3.1 Vision

“A preferred University for developing leadership in technology and productive citizenship” (DUT 2015:6).

6.3.2 Mission

To excel through:

- a teaching and learning environment that values and supports the University community;
- promoting excellence in learning and teaching, technology transfer and applied research; and
- external engagement that promotes innovation and entrepreneurship through collaboration and partnership (DUT 2015:6).

6.3.3 Values

- academic freedom, collegiality and ethical behavior;
- institutional autonomy;
- good governance based on accountability, co-operative governance and transparency;
- relevance to society, both local and global;
- seeking new knowledge through research;

- understanding our students as developing human beings; and
- seeing staff development as essential in the DUT purpose.

Turning from DUT’s vision, mission and values, it is worth knowing the number of staff members connected to applications processing and registration.

6.3.4 Durban University of Technology staff information

DUT’s Management Information Systems department provided the researcher with staff information. Table 6.1 shows that DUT has 151 staff working in admissions and registration.

Table 6-1: Administration staff headcount from 2012 to 2016

YEAR	NO. OF ADMIN STAFF	NO. OF STAFF WORKING WITH REGISTRATION AND ADMISSION
2012	413	102
2013	425	105
2014	423	107
2015	435	111
2016	522	151

Source: Data provided by DUT intuitional planning department as requested by the researcher in 2016

The staff working with registration and admission as shown in Table 6.1 likewise engage with the CAO and the CAS.

6.3.5 Durban University of Technology student information

DUT’s Management Information Systems department provided information of undergraduate and postgraduate enrolment from 2012 to 2016. The information is about three campuses, Durban, Indumiso and Riverside. Table 6-2 shows this information.

Table 6-2: Student headcount per campus for 2012 to 2016

YEAR	UNDERGRADUATE (UG)			UG TOTAL	POSTGRADUATE (PG)			PG TOTAL	GRAND TOTAL
	Durban	Indumiso	Riverside		Durban	Indumiso	Riverside		
2012	20 173	1 974	2 161	24 308	558	7	2	567	24 875
2013	20 893	2 171	2 333	25 397	656	5	1	662	26 059
2014	20 987	2 378	2 346	25 711	752	8	1	761	26 472
2015	21 267	2 394	2 394	26 055	939	16	13	968	27 023
2016	21 721	2 531	2 651	26 903	1 149	14	4	1 167	28 070

Source: Data provided by DUT intuitional planning department as requested by the researcher in 2016

As Table 6.2 indicates, DUT had 26,903 undergraduate students across these three campuses in 2016 when the data were collected. All of these enrolees would have proceeded through the CAS. The next section provides contextual information about the University of KwaZulu-Natal.

6.4 Context of the University of KwaZulu-Natal

This section presents the context of DUT in terms of its vision, mission, values and staff and student information. The UKZN is organised in accordance with the College Model in HE. There are four colleges and the leadership of each college oversees a number of schools. Five campuses comprise the UKZN. The background about UKZN is extracted from the university’s Strategic Plan for 2007-2016, which articulates the vision, mission and values of the university, which are discussed next (UKZN 2017:6)

6.4.1 Vision

“To be the Premier University of African Scholarship” (UKZN 2017:6).

6.4.2 Mission

According to the UKZN 2007-2016 strategic plan, the following is the university's mission, to be "A truly South African university that is academically excellent, innovative in research, and critically engaged with society" (UKZN 2017:6).

6.4.3 Values

"The University aspires to be a positively transformed institution based on a clear understanding of its goals for broad and comprehensive change and underpinned by shared values. These values serve as a framework for all its endeavours" (UKZN 2017:9).

6.4.4 University of KwaZulu-Natal staff information

UKZN's Institutional Intelligence (II) department supplied the information about UKZN's support staff. However, they could not provide the specific classification of administrative staff working with student admissions as these under the umbrella classification of support staff. In 2016, there were 844 permanent support staff members in the UKZN database. Table 6.3 presents this information.

Table 6-3: Permanent support staff

STATISTICAL INFORMATION FOR STAFF AT UKZN					
PERMANENT SUPPORT STAFF AT UKZN					
CAMPUS	2012	2013	2014	2015	2016
College of Agr, Eng & Science	320	321	310	320	323
College of Health Sciences	226	216	189	189	207
College of Humanities	151	156	146	147	149
College of Law & Man Studies	125	119	102	100	104
Registrar	54	53	54	56	55
Student Services	6	6	5	6	6
Grand Total	882	871	806	818	844

Source: Data provided by UKZN II to the researcher 24 November 2016

The staff who participated in this study were from the Offices of the Registrar and Student Administration Services. The researcher was unable to discern the number of administrative staff members working directly with admissions and registration, as II did not capture the information in a way to make this determination.

The next subsection provides information about student enrolment according to the four colleges.

6.4.5 University of KwaZulu-Natal student information

UKZN's II department provided information about students' enrolment. The information is disaggregated by colleges generally and then by the five campuses with a focus on undergraduate enrolment.

6.4.5.1 Enrolment trends per college

In 2016, UKZN recorded 46,545 students in the four colleges, which had steadily increased since 2012 when the total number of registered students was 42,089. Table 6.4 displays this data.

Table 6-4: Total number of registered students 2012 – 2016

TOTAL NO OF STUDENTS AT UKZN 2012-2016					
College	2012	2013	2014	2015	2016
College of Agriculture, Engineering & Science	8861	9360	9856	9565	9757
College of Health sciences	5859	6424	6213	6582	6568
College of Humanities	17308	17719	18151	18411	19104
College of law & Management studies	10061	10673	11433	11132	11116
TOTAL	42089	44176	45653	45690	46545

Source: Data provided by UKZN II to the researcher 24 November 2016

Table 6.4 demonstrates that the highest number of enrolments are in the College of Humanities and the College of Law and Management Studies. Undergraduate enrolments by campus

The total number of undergraduate enrolments was 33,526 in 2016, with Howard College campus having the most, with 12,363 students.

Table 6-5: UKZN undergraduate enrolments 2012 – 2016

TOTAL NO OF UNDERGRADUATE STUDENTS BY CAMPUS					
CAMPUS	2012	2013	2014	2015	2016
Edgewood	4281	4021	3871	4180	4378
Howard College	10441	11321	12047	11992	12364
Medical School	1098	1129	1154	1368	1453
Pietermaritzburg	7792	7508	7236	6809	6410
Westville	8913	9083	9643	8942	8921
GRAND TOTAL	32525	33062	33951	33291	33526

Source: Data provided by UKZN II to the researcher 24 November 2016

Although the CAS is the case under study, it is important to understand the context of the universities with which it operates. The subsequent section will focus on secondary data presentation and analysis.

6.5 Organisation of Secondary Data Presentation and Analysis

As previously explained, documentary evidence is one of the sources of data collection for this study. The researcher integrated results of document analysis with primary qualitative data to inform a better understanding of constructions offered by respondents. The researcher used documentary evidence to determine corroboration and augmentation in relation to primary data (Yin 2009a:103). Table 6.6 shows three aspects related to analysis of documents. The first column indicates the value of documents. The second column lists documentary sources. The third column indicates how those documents apply to the study.

Table 6-6: Application of document analysis

APPLICATION OF DOCUMENTS	DOCUMENTS EXAMINED	APPLICATION TO THE STUDY
Documents can provide data on the context within which research participants operate.	DHET Statistics of Post School Education (2014) DUT Strategic Plan 2015 - 2019 UKZN Strategic Plan 2007 - 2016	Information from these documents gave an overview of the nature of HE application trends and analysis.
Information contained in documents can suggest some questions that need to be asked and situations that need to be observed as part of the research.	CAO Annual Report 2013/2014 CAO Annual Report 2014/2015	Based on the CAO annual reports, interviewees were asked to interpret operations outcomes by the CAO. This assisted with methodological triangulation.
Documents provide supplementary research data.	CAO Annual Report 2014/2015 CAO Statistical Data of DUT and UKZN (Information provided by CAO to the researcher 2016)	Statistics gave a clearer picture to validate what participants said regarding the CAO, the use of the Call Centre and the communication to students by the CAO, to mention a few examples.
Documents provide a means of tracking change and development.	CAO – Cycle of an application CAO Statistical Data of DUT and UKZN (Information provided by CAO to the researcher 2016)	A cross analysis was done to compare data provided by the universities and the DoE on enrolment trends, this was compared to the information provided by the CAO, to see how many students applied and ended up registering. This process was unique in that the researcher could combine the information from different sources of information to show the application vs the registration pattern.

Cont.

APPLICATION OF DOCUMENTS	DOCUMENTS EXAMINED	APPLICATION TO THE STUDY
Documents can be analysed as a way to verify findings or corroborate evidence from other sources.	CAO Annual Report 2014/2015 CAO Statistical Data of DUT and UKZN (Information provided by CAO to the researcher 2016)	The CAO provided information on their operations. These were detailed information of their call centre, manual, web applications etc. This allowed validation and verification with results from various data collection tools.

Source: Adapted by research from Bowen (2009:29-30)

6.6 Organisation of Primary Data Presentation and Analysis

The data presentation will follow the following sequence. The first subsection, 6.7.1, presents and analyses interview data. The second subsection, 6.7.2, presents and analyses group interview data. The second subsection, 6.7.3, presents and analyses focus group data. Results of primary qualitative data, from each data collection tool, are organised under the following subheadings:

- Understanding the Centralised Application System
- The role of the Central Applications Office in the Central Application System
- Efficiency and effectiveness of the Central Application System
- Fitness of the Central Applications System as an Applications processing model

In an effort to ensure anonymity, all the participants were given codes. Table 6.7 codes assigned to respondents for all data sets.

Table 6-7: Respondent codes for qualitative data

DATA COLLECTION TOOL	CAO	DUT	UKZN
Interviews	N/A	DAR1 DDR1	UDSA UPAAO
Group interview	R1COM R2CA M R3CAIM R4CITM	N/A	N/A
Focus groups	N/A	FDP FDP5	FUP1 FUP8

Source: Researcher assigned codes during data analysis

6.7 Presentation and Analysis of the Qualitative Data

The data are displayed in matrices, which will be used to draw findings and conclusions from the information gathered from in-depth interviews, a group interview and focus groups. Matrices are

argued to be useful in the facilitation and comparative analysis of data, as well as to draw logical conclusions. Matrices are also used to detect patterns in data (Bazeley 2009:9; Onwuegbuzie *et al.*, 2009:5). Secondary data will be used concurrently in the presentations to confirm/disconfirm and verify the findings. Documentary evidence is also used to support or contradict the participants' views and statements.

6.7.1 Interviews

6.7.1.1 Understanding the Centralised Application System

Application processes can be laborious and have a lot of steps that students must take, for example taking selection tests and applying for funding (Klasik, 2012:9), which is why the CAS application process must be as straightforward as possible. Matrix 6.1 indicates that the CAO staff is clear about the organisation's responsibilities.

Matrix 6-1: Application Process

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Application processes	CAO manages the entire application process for undergraduate students, from capturing the application to sending information to students. DDR1, UPAAO, UDSA, DDRI
	Follow up on application feedback is done with the CAO, they are the ones that send students letters and SMSs. DAR1, DDR1, UDSA, UPAAO
	The CAO system is easy to use with colour coding functionality that makes it easy to do selection and assist with the tracking of students. UPAAO, DAR1

Source: Researcher's fieldwork 2015 - 2016

Transfer students and international or foreign students have specific processes to follow, because the results from other institutions need to be evaluated to see if they are relevant for the programme, and to see if the academic performance of a student warrants admission (Mullin 2012:7). In addition to academic transcripts, these students also need to submit additional documents such as ID or passport copies for identification. The procedure for admitting international student is different and has to be managed with care. The institution can be liable to penalties if they accept a foreign student with the correct study permit as an example. As an example, Hourigan (2011:40) notes that Monash College faced serious repercussion for admitting international students without following the correct procedures, information from the admission centre having not been sufficient to help them see that they were violating their own admission policy.

Students transferring from other institutions also have a different process aligned to them, yet the UKZN staff indicated that the CAO does not manage this process well. In Matrix 6.2, it is highlighted that both staff and students must understand the operations of the CAS process.

Matrix 6-2: Operational Clarity

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Lack of clarity	CAO does not manage applications for transfer and international students well. UPAAO, UDSA
	Students do not understand the application process; they still want to be reminded to go to the CAO. UDSA

Source: Researcher's fieldwork 2015 - 2016

There was also a clear indication that staff believe that students get confused about the application process. The next aspect that is important is the quality of the applicants' information that CAO captures for universities. Data can be about the prospective students' biographic details and demographics information, for example, age, gender, grades and so on (Romero and Ventura 2013:2), but important for decision making and information. Therefore, it has to be accurate. However, one of the aspects that came strongly out of the interview is how both DUT and UKZN are challenged by the inaccurate data that they can from the CAO.

Matrix 6-3: Data quality

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Capturing errors	Inaccurate information captured by the CAO. If information is not available on the application record for selection by university staff, it delays the process. UPAAO, DARI, UDSA
	CAO captures a large number of applications for institutions on behalf of institutions. DDRI, UPAAO
Missing information	Some information is missing on the application records, such as IDs, and this makes it frustrating for staff. UPAAO, DARI, UDSA

Source: Researcher's fieldwork 2015 - 2016

According to Matrix 6.3, the CAO does not accurately capture all the necessary information, thus creating delays. These delays may contribute to complaints from clients, and inaccurate data may affect the validity of the institution's reports. Enough information is also not available to make admission decisions. This compromises the admissions process, which is already complex (Clinedinst and Hawkins 2011:19), and is informed by information about the applicant.

Another concern about missing information is that the university may not address the special needs of students if their information is not captured or if it is incorrectly captured. If the universities do not have information about the student's race, gender or disability status, they are unable to effectively address their enrolment targets and meet their transformation requirements. Equally, the universities will be unable to provide resource for students with special needs. Heagney (2012:10) emphasises that disabled students face particular challenges that require different types of infrastructural needs, therefore it is imperative that when an offer is given to a disabled student, they can be supported depending on the nature of their disability.

The following findings articulates the systems perspective on the operationalisation of the CAS as a model. According to Effah and Liu (2014:2) argues that virtual processes are conducted via the internet and the web, but, equally physical or manual processes (those that have direct, human to human contacts) can also be virtualized by making them Internet and web enabled. The CAO gas both functionality, however this section taps into the online systems operation.

6.7.1.2 The role of the Central Applications Office in the Central Application System

The role of the CAO can be summarised in terms of the six key responsibilities outlined in Matrix 6.4 in the first column. These responsibilities are presented in conjunction with the CAO application life cycle as depicted in Figure 6.2.

Matrix 6-4: CAO application life cycle and the applications at DUT and UKZN

SUB-CATEGORY	RESPONSES FROM UNIVERSITY PARTICIPANTS	CAO APPLICATION CYCLE
Student recruitment	The CAO does career fairs for institutions and marketing, and sends information to schools. DAR1, DDR1, UDSA	AA1/B3
Data capturing	The CAO assists with capturing a large number of applications that institutions do not have to deal with. DDR1 UDSA, DDR1, DAR1	A5
Matric results	The CAO uses the matric file to match and upload the matric results of the applicants from the DOE. They look at the application record, biographical data (IT, surname), if they find a match, they then get the NSC results directly to the system. The CAO then uses the results to run the selection criteria, which makes it easy for institutions to see which applicant can be selected and those that cannot be selected. This all happens online and application status are updated online. DDR1, DAR1 UDSA, UPAAO	A2/B5
IT	The CAO provides the convenience of an online application process. DDR1, UDSA, DAR1	AAA1
	The CAO provides reports to the universities. DDR1, DAR1, UDSA	A6
	The CAO stores the application documents online; no physical documents are onsite. UDSA	A2/B5
Customer services	Follow up with students is done via the CAO; they send them SMSs and letters communicating the outcome of their applications. UDSA, DDR1, UPAAO DAR1	A1/B4.1

Source: Researcher's fieldwork 2015 - 2016

The above categories are indicative of the students' value chain, from recruitment until their information is handed over to the institutions where they will ultimately register.

The other issue raised is that the CAS approach can be cost effective for institutions. This is indicated in Matrix 6.5 which addresses both the financial and human resources aspects about the

CAO. The financial and human resources aspects refer to the cost for the universities and applicants to be able to apply and gain access to the HEIs.

Matrix 6-5: Financial and Human Resources

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Saving costs	DUT received 75,000 applicants thus far let's assume that we had to continue to get those number of applications eh it would take quite a massive infrastructure to deal with which would be costly for the institution in terms of staff. DDR1
	The university is losing funds because they do not get the application fee while that money they could be getting as an institution. UDSA
	CAS takes away the burden of setting up applications office and for document storage. DDR1, UDSA
	The marketing costs are a joint approach as the CAO does career fairs on behalf of all the institutions they service. Their handbook has all the information you need about the courses. DDRA, DAR1, UDSA
	Because of the CAS process all applications the university reduces number of temporary staff in the admission office for data capturing. UDSA, DAR1

Source: Researcher's fieldwork 2015 - 2016

The responsibility of capturing the applications lies with the CAO. Therefore, the HEIs save the cost of employing additional staff or temporary staff members. The CAO is also responsible for printing and distributing forms on behalf of institutions at all career fairs and schools in KZN. This distribution of forms is indicated in Table 6.8 and is for all member institutions. Note that in 2015, of the 78,000 DUT and 116,000 UKZN forms distributed, less than 20% were returned, i.e. the CAO bears those costs.

Table 6-8: CAO distribution of forms

Distribution of Forms												
Delivery Method	2015 Entry			2014 Entry			2013 Entry			2012 Entry		
	Distributed	Returned	%	Distributed	Returned	%	Distributed	Returned	%	Distributed	Returned	%
Schools Mailing	250 000	25 812	10,32	200 000	19 741	9,87	260 000	21 464	8,26	250 000	18 942	7,58
Career Fairs	81 000	9 100	11,23	130 000	18 155	13,97	100 000	8 684	8,68	100 000	6 660	6,66
Reception	106 000	11 040	10,42	84 000	11 992	14,28	30 000	4 010	13,37	9 000	2 567	28,52
Requested	27 731	5 357	19,32	18 628	4 795	25,74	33 879	6 307	18,62	18 276	4 060	22,21
Directly by CAO	464 731	51 309	11,04	432 628	54 683	12,64	423 879	40 465	9,55	377 276	32 229	8,54
DUT	78 000	10 539	13,51	98 000	11 641	11,88	90 000	10 069	11,19	85 000	9 836	11,57
MUT	56 000	5 985	10,69	53 000	5 525	10,42	65 000	5 669	8,72	60 000	3 033	5,06
UKZN	116 000	12 820	11,05	109 000	12 521	11,49	130 000	13 585	10,45	125 000	9 559	7,65
UNIZULU	40 000	3643	9,11	38000	5695	14,99	90000	8061	8,96	105000	8938	8,51
Total by Universities	290 000	32 987	11,37	298 000	35 382	11,87	375 000	37 384	9,97	375 000	31 366	8,36
FET Colleges	1 500	93	6,20	0	0	0,00	15 000	368	2,45	5 000	286	5,72
Private Colleges	3 500	212	6,06	0	0	0,00	8 000	653	8,16	15 000	685	4,57

Source: CAO Annual Report (2014/2015:11)

The staff's perspective on how students benefit from the CAS process emerged strongly in the analysis. Access to post-secondary education is riddled with complex and complicated application processes (Auddy & Mukhopadhyay, 2014:24; Clinedinst & Hawkins, 2011:5; Heagney, 2012:67). If these processes are not properly managed they may hinder institutions from achieving the set objectives to correct past injustices, as indicated in the literature review chapter, section 2.2. Therefore, it is imperative that institutions address access as adequately as possible. The CAO gives statistical data about the applicants that can be used at DUT and UKZN to ensure that the national imperatives are achieved by these institutions. It provides information about the institutions, which they can submit to government as part of reporting their enrolment patterns, the background of the students, from where they come, and for which programmes they have applied. All this information is important not only for facilitating the application process, but also for understanding clients and how institutions can support clients based on that information. Matrix 6.6 emphasises the validity of the management information provided by the CAO to DUT and UKZN.

Matrix 6-6: Management Information

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Data analytics	CAO provides statistical reports on all the data we need for reporting to management. DAR1, USDA
	The CAO makes HEMIS reporting very easy for our MIS as Universities report to government on for example our gender, our race, our religion. DAR1
	CAO stores the data of how many disabled students have we got, how many married, how many single, how many males, how many females, how many African, how many whites etc. etc. DAR1
	University gets information from the CAO about applicants and we can see which is our top 10 feeder schools on KZN and schools based on quintiles. DAR1, USDA

Source: Researcher's fieldwork 2015 - 2016

Public HEIs report to the department on student enrolment data using a data collection tool Higher Education Management Information System (HEMIS) (DHET, 2017:12). Consistent with the responses in Matrix 6.4, Table 6.9 shows statistical information provided by CAO to DUT. It is a report of the top feeder schools and their ranking as indicated in the annual report from the CAO. Table 6.10 shows the same report for UKZN. DUT and UKZN can use this information to align their funding according to the schools, depending on the quintiles from which the students come. This in turn can inform the funding from NSFAS and help universities meet their enrolment target requirements.

Table 6-9: DUT feeder school ranking

DUT Feeder Schools' Ranking (2013 – 2015)

School Name	2015 Ranking	2015 Count	2015 Met	2014 Ranking	2014 Count	2014 Met	2013 Ranking	2013 Count
KZN Matric Excellence	1	524	0	1	668	19	1	423
Berea Technical College	2	291	66	2	305	77	3	202
Star Schools	3	263	5	7	196	3	6	145
Intuition Computer College	4	222	0	4	242	5	2	222
Umlazi Corn Tech High School	5	220	40	3	278	78	4	192
Icesa Matric School	6	205	2	8	170	3	13	111
Ogwini Comprehensive Technical High School	7	185	41	5	207	60	7	141
Sibusisiwe Comprehensive School	8	131	52	100	76	42	113	58
Bizana Village Senior Secondary School	9	130	17	64	87	36	178	45
Futura High School	11	127	11	11	144	17	8	137
Sithengile High School	10	127	52	20	126	66	19	100
Old Mill High School	12	125	46	36	97	33	32	82
New West Secondary School	13	123	62	9	156	104	14	111
Groutville High School	14	117	32	148	63	21	389	27
Sinethezekile Combined School	15	110	55	56	89	49	73	68
Mchitheki High School	16	110	14	109	72	22	128	54
Menzi Secondary School	17	108	63	78	83	46	363	28
Margot Fonteyn Secondary School	18	106	36	31	103	58	85	63
Velangaye High School	19	105	16	12	143	53	9	134
ML Sultan Secondary School	20	103	29	49	91	44	29	89

Source: CAO Annual Report (2014/2015:38)

DUT can use the information provided by the CAO in Table 6.9 to devise informed marketing strategies for the top-ranking schools. DUT can also use this information to expand their footprint

as a university whereby DUT can become better known to more students as a university of choice. Because DUT knows exactly where their clients are coming from and DUT can support these students accordingly. Table 6.10 shows the feeder school ranking for UKZN.

Table 6-10: UKZN feeder school ranking

UKZN Feeder Schools' Ranking (2013 – 2015)

School Name	2015 Ranking	2015 Count	2015 Met	2014 Ranking	2014 Count	2014 Met	2013 Ranking	2013 Count	2013 Met
KZN Matric Excellence	1	413	0	1	522	1	1	347	14
Star Schools	2	315	0	3	244	3	4	196	37
Umlazi Com Tech High School	3	300	62	2	311	79	2	222	73
Intuition Computer College	4	206	0	5	219	0	3	217	21
Pinetown Girls High School	5	202	124	19	173	120	20	126	95
Icesa Matric School	6	196	2	25	162	1	24	119	14
Ogwini Comprehensive Technical High School	7	191	32	6	214	41	6	162	46
Bizana Village Senior Secondary School	8	173	34	56	122	29	160	60	15
New West Secondary School	9	162	56	11	195	98	11	150	83
Durban Girls High School	10	156	138	10	198	171	9	155	139
Futura High School	11	155	6	32	146	9	26	118	5
Khombindlela High School	12	152	32	61	119	58	77	85	39
Greenbury Secondary	13	147	86	30	147	96	17	130	91
Old Mill High School	14	147	25	38	137	41	51	98	37
Alexandra High School	15	141	53	47	125	67	18	128	70
Westville Girls High School	17	139	124	28	157	147	13	149	134
Port Shepstone High School	16	139	62	34	144	89	25	119	69
Menzi Secondary School	18	138	89	57	122	75	145	65	42
Pietermaritzburg Girls High School	19	137	103	35	141	117	8	156	129
Velangaye High School	20	136	28	7	204	63	7	161	45

Source: CAO Annual Report (2014/2015:38)

The information displayed in Table 6.10 is valuable for planning purposes and for informing the institutions about admission trends. Admission office staff are also responsible for conducting statistical analyses and for projecting predictions on yield rates (Clinedinst & Hawkins, 2011:18). These are based on the enrolment targets and objectives that are set, so the staff use particular information in the system to make these determinations. This also assists in ensuring that classes are filled and that universities meet their enrolment targets (Heagney 2012:67). With statistical information, the institutions are able to ensure that they can manage the trends in their respective environments. The institutions can also measure student performance in class and link it to these feeder schools or areas. Ideally, this information can be aligned to student success as the data can be used to support the students accordingly. As Spall (2013:6) point out, a number of learning deficiencies can be accredited to students' primary and secondary schooling. These deficiencies should be addressed by universities to ensure throughput of students.

The above findings from the interviews as shown in the foregoing matrices give a general understanding of the functions that the CAS offers on behalf of the HEIs. What was also indicated from the staff's perspective is the benefit for students. The next section within the data analysis

of the interviews covers the role of the CAO in the CAS. One of the objectives of this study was to identify the factors that facilitate and hinder the efficiency and effectiveness of the application processes. The efficiency and effectiveness of the CAS is discussed next.

6.7.1.3 Efficiency and Effectiveness of the Centralised Applications System

A number of factors can influence the application process either negatively or positively, therefore it is critical to highlight those issues that have been raised by the respondents as either facilitating or hindering its efficiency and effectiveness, and subsequently the CAS. This will clear up some misconceptions about the general challenges that arise during the application process, as well as the misunderstandings about the CAS. On one hand, the CAS's efficiency means optimising students' satisfaction through conveniently available information and timeous responses, mainly through an online platform (Damanpour & Aravind, 2011:425). On the other hand, the CAS's effectiveness means the provision of quality service, meeting targets, and gaining information through high quality, consistent and reliable data (Blasch, Valin & Bosse, 2010:1; Stewart-Weeks, 2015:72). The upcoming matrices display these factors, buttressed by discussion before and after the matrices. Factors that facilitate the CAS process are discussed first, followed by those that hinder it.

a. Factors that facilitate the efficiency of the Central Applications System

Student and staff satisfaction about the CAS is greatly influenced by how they receive feedback from the CAS. From the staff's perspective, they want to be able to use the system without hurdles. Factors that facilitate the efficiency of the CAS are listed in Matrix 6.7.

Matrix 6-7: Factors that facilitate the efficiency of the CAS

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Communication	The CAO updates the application status and communicate to students they send them SMSs and letters communicating the outcome of the applications. UDSA, DDR1, UPAAO DAR1
IT Functionality	The CAS system is easy to use with colour coding functionality that makes it easy to do selection. UPAAO, DAR1
	Eh no I think I personally like the CAO system meaning on what I can compare it to, we use our ITS system in January. UPAAO
	The university can trace the applications online and students can check the application status with the CAO. DDR1, DAR1, UPAAO,
	CAO offers convenience of online application process. DDR1, UDSA, DAR1

Source: Researcher's fieldwork 2015 - 2016

The staff indicated the convenience that is offered by the CAO’s IT system, which makes the decision-making process seamless. Newman *et al.*, (2010:14) highlight that one way of ensuring a high number of applicants is to offer simplified online applications. Matrix 6.6 indicates that the CAO service provides the efficiency that the staff require, which contributes to the applicants receiving feedback timeously.

b. Factors that hinder the efficiency of the Central Application System

Information Technology (IT) is critical for bringing about efficiency in processes (Clinedinst & Hawkins, 2011:19), yet the staff indicated that there is a lack of compatibility between the different systems, namely the CAO system and ITS. To add to this, NSFAS is now using its own Central Application System for funding applications. As per the DHET (2016:16), the integration between the CAS and the NSFAS gives students the opportunity for a more inclusive and streamlined application process, as they can apply for academic admission and funding in the centralised methodology. The challenge, as indicated by the participants, is that these two systems seem to be independent of each other and the institutions use various systems which differ from that of the CAO. These challenges are presented in Matrix 6.8.

Matrix 6-8: Factors that hinder the efficiency of the CAS

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS’ RESPONSES
IT systems compatibility	The IT systems used at universities need to be compatibility of with that of the CAO system; the CAO system is slow especially during peak periods. UDSA, UPAAO
	Addressing differences among universities including the use of different IT systems. UPAAO, UDSA
	The use of completely different systems, there is no link to the NSFAS application there is no way to merge the two together. DARI
Manual processes	Majority of applicants have preference of paper-based applications than online applications. DARI, UDSA

Source: Researcher’s fieldwork 2015 - 2016

The staff also noted that most students still prefer to submit manual application forms. Clinedinst & Hawkins (2011:19) suggest that technology is still used, although the admission process relies on personal contact and paper, even though the trend is changing where there is a slight decrease in the number of applications being captured manually. Table 6.11 indicates the different ways that prospective students submit their applications to various institutions, with paper application being the highest.

Table 6-11: Different ways of submitting applications**Number of Applicants Applying by Paper, Email, Fax and Web (2012 – 2015)**

Entry Year	Total Apps	Paper Apps	% of Paper Apps	Web Apps	% of Web Apps	Email	% of Email Apps	Fax	% of Fax Apps	Hand Delivered to CAO	% of Hand Delivery Apps
2015	134 385	81 183	60,41	46 901	34,90	1 161	0,86	59	0,04	14 123	10,51
2014	124 964	86 908	69,55	33 039	26,44	1 014	0,81	93	0,07	13 089	10,47
2013	105 502	74 026	70,17	24 541	23,26	659	0,62	76	0,07		
2012	91 418	70 813	77,46	15 859	17,35	536	0,59	106	0,12		

Source: CAO Annual Report (2014:14)

The information in Table 6.11 is important because it is a clear indication that prospective students still prefer paper-based applications, yet the CAS is geared to be an online application process. The question arises as how this majority will be catered for if CAS is completely online. The next two subsections present and analyse data about factors that facilitate or hinder the effectiveness of the CAS.

c. Factors that facilitate the effectiveness of the Central Application System

The importance of student recruitment is highlighted by Altbach *et al.*, (2009), Zhang and Hagedorn, (2011) and Simões & Soares, (2010), who argue that institutions can meet their targets through effective career information so that students can make informed decisions about the institutions in which they wish to enrol. The matric results of prospective students inform the selection and admission of those based on the admission policies and various targets that the institutions need to meet (Clinedinst & Hawkins, 2011:19; Nel & Kistner 2009:56; Rankin *et al.*, 2012:32; Palmer *et al.*, 2011:9). According to Clinedinst and Hawkins (2011:19), institutions depend on technology to effectively distribute information about institutions' procedures. Notably, IT provides a platform for achieving effectiveness in the process. The students' view will be further outlined in the quantitative data analysis section, while aspects of IT will be addressed under the factors that facilitate or hinder efficiency and effectiveness in the application process, and subsequently the CAS. Factors that facilitate the effectiveness of the CAS are presented in Matrix 6.9.

Matrix 6-9: Facilitating the effectiveness of the CAS

SUB-CATEGORY	UNIVERSITY PARTICIPANTS' RESPONSES
Student recruitment	The CAO does career fairs for institutions and marketing, and sends information to schools. DAR1, DDR1, UDSA
Data capturing	The CAO assist with capturing of large number of applications that institutions do not have to deal with. DDR1 UDSA, DAR1
Customer service	Follow up with students is done via the CAO, they send them SMSs and send them letters communicating the outcome of the applications. UDSA, DDR1, UPAAO DAR1
Data analytics	CAO provides statistical reports on all the data the we need for reporting to management. DAR1, UDSA

Source: Researcher's fieldwork 2015 - 2016

As shown in Matrix 6.9, data from the interviews indicate that the CAO is helpful in managing the application cycle. This was also noted by interviewees in the previous section. The CAO holds career fairs on behalf of institutions, captures applications and communicates with students regarding the application feedback received from the institutions. They also provide statistical data so that the institutions can manage their enrolment goals and targets.

In the same light, issues of concern that negatively influence the effectiveness of the process have been highlighted.

d. Factors that hinder the effectiveness of the Central Application System

Application feedback is important for both applicants and the universities in the application process (Mullen 2011:8). Matrix 6.10 gives an outline of some of the hindrances that negatively influence the effectiveness of the application process.

Matrix 6-10: Factors that hinder the effectiveness of the CAS

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Processing timeframes	Data capturing error by the CAO errors inaccurate and mission information delaying the selection process. UPAAO, DAR1, UDSA
	Application processes must be clearly outlined, as some students do not understand when to follow up with the CAO and when to start negotiating with the university. UPAAO, UDSA
	Students wait for the last minute to apply, as a result increasing the late applications in January. DAR1
	Post Office influencing the turnaround time as students don't receive the acceptance packages and only to have their offers withdrawn by the University, then come to campus and create additional queues. DAR1
Communication	User schools need to disseminate information to students. This can be challenging as sometimes school Principals do not distribute the information to applicants. DAR1

Source: Researcher's fieldwork 2015 - 2016

Reliance on the Post Office is indicated as one of the hindrances in the application process that contributes to the delays and possible confusion in January. Heagney (2012:17) indicates that the traditional way of mailing letters remains the standard practice for most universities to inform students of their admission decisions, although other means of communicating to applicants such as sending a Short Message Service (SMS), calling or sending e-mails informing them about the status of their applications are also used. Some also provide facilities that allow for a self-check process on their website. However, these do not replace the need to mail information and letters to applicants. Nevertheless, if students are unable to receive the application package informing them of their successful application they will not be in a position to inform the university that their offer is accepted. Nor will they be able timeously to pay the required deposit, where this is applicable, so subsequently the offer will be withdrawn and given to someone else on the waiting list (Auddy & Mukhopadhyay, 2014:30). In 2015, out of 134,385 applications received by the CAO, only 34.9% were Web applications and 60.4% on paper. Those that were hand-delivered constituted approximately 10.4%. Other modes that prospective students used to send application forms are via e-mail and fax, according to the contents of CAO's annual report (CAO, 2014/2015).

The implication of the above, as indicated by participants is that students come directly to campuses in January to check the status of their applications, causing delays because staff then need to spend time explaining to them why their offer was withdrawn and discuss alternatives. An effective system can facilitate this process, with minimum dependency on the Post Office established through an efficient online process.

One of the objectives of the study was to determine if the CAS would be a fit model for HEIs, thus specific interview questions were asked to gain the impression from respondents about what the fitness of the CAS means. The responses will be presented in the matrices that follow in the next subsection.

Matrix 6-11: Operational Clarity

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Lack of clarity	CAO does not manage applications for transfer and international students well. UPAAO, UDSA
	Students do not understand the application process; they still want to be reminded to go to the CAO. UDSA

Source: Researcher's fieldwork 2015 - 2016

There was also a clear indication staff believed that students are confused about the application process. The next aspect that is important is the quality of the applicants' information that CAO captures for universities. Data can be about the prospective students' biographic details and

demographic information, for example, age, gender and grades (Romero & Ventura, 2013:2), but important for decision-making and information. It therefore has to be accurate but one aspect emerged strongly from the interview was how both DUT and UKZN were challenged by inaccurate data from the CAO.

Matrix 6-12: Data quality

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Capturing errors	Inaccurate information captured by the CAO. If information is not available on the application record for selection by university staff, it delays the process. UPAAO, DAR1, UDSA
	CAO captures a large number of applications for institutions on behalf of institutions. DDRI, UPAAO
Missing information	Some information is missing on the application records, such as IDs, and this makes it frustrating for staff. UPAAO, DAR1, UDSA

Source: Researcher's fieldwork 2015 - 2016

Matrix 6.12 indicates that the CAO does not accurately capture all the necessary information, thus creating delays which may contribute to complaints from clients, and inaccurate data may affect the validity of the institution's reports. Nor is sufficient information available to make admission decisions, compromising an admissions process that is already complex (Clinedinst & Hawkins, 2011:19), and informed by information about the applicant.

Another concern about missing information is that the universities may not address the special needs of students if their data is not captured or is incorrectly captured. If they do not have information about the student's race, gender or disability status they are unable to effectively address their enrolment targets and meet their transformation requirements. Equally, they will be unable to provide resource for students with special needs, whom Heagney (2012:10) emphasises face particular challenges that require different types of infrastructural needs. Therefore, it is imperative that when an offer is made to a disabled student he or she can be supported, depending on the nature of the disability.

6.7.1.4 Fitness of the Central Applications System as an Applications processing model

As indicated in the previous chapters, this study was also undertaken to determine if the CAS will be a fit system for the HEI's application processes. The CAS process is the only known method of a central system in South Africa. Hence the data were in reference to the operations of the CAS to determine its fitness for purpose, which will inform the South African HE landscape.

Matrix 6.13 outlines the perspectives from the interviewees about the fitness of the CAS using information about the CAO. The respondents felt that a fit system is the one that addresses the aspects as indicated in the components delineated in the first column of Matrix 6.13.

Matrix 6-13: Fitness of the CAS

COMPONENTS	UNIVERSITY PARTICIPANTS' RESPONSES
IT functionality	Compatibility of systems between system used by universities and the CAO system. UDSA, UPAAO
	Investment on good, smart, IT system that will not fail. DDR1, DARI, UPAAO, UDSA
Internet accessibility	Provide 3G to schools for internet access at schools, particularly in rural KZN. DARI, UPAAO
Document storage	Documents are stored online, no physical documents on site. UDSA
Gaps in the CAS	The CAO works well although there is a need to addressing the gaps with the CAS approach. DARI, UDSA
Recourses	The CAS should start small at provincial or regional level. DRA1, UDSA, UPAAO
	CAO does not interfere with institutional processes. DARI
	The CAO service makes higher education affordable and accessibility by offering one application fee. DDR1, DARI, UDSA

Source: Researcher's fieldwork 2015 - 2016

As Matrix 6.13 reveals, one of the challenges highlighted by the participants was that the IT systems used at universities need to be compatible with each other and reliable. The two institutions use the ITS system, which is a different system from the CAO one. Institutions cannot afford downtime, especially during peak periods. It is also imperative to compare and contrast the different systems. Interviewees were asked to do this in an attempt to try to establish their preference, having experienced the CAS. The next section indicates the differences of opinion as far as the CAS and the institutions' systems are concerned. Matrix 6.14 shows the views of the staff regarding benefits the students receive from the CAS process.

Matrix 6-14: University staff perspectives on benefits for students

SUB-CATEGORIES	UNIVERSITY PARTICIPANTS' RESPONSES
Affordability	The service provided for by the CAS makes higher education both affordable and accessibility by offering one application fee. DDR1, DARI, UDSA
Increased access	Students not meeting the admission requirement can be accepted by other universities, and universities can see if a student has applied elsewhere. UDSA, DARI

Source: Researcher's fieldwork 2015 - 2016

Matrix 6.14 suggests that staff also felt that, because of the single application fee for a number of application choices at different institutions, this is affordable for the students, unlike having to pay different institutions. Moreover, the CAS gives students an opportunity to make a decision in the event that the one university does not offer him/her a place, i.e. the system allows for flexibility. Norton (2012:32) indicates that with a central application system, an applicant can apply to multiple HEIs and for several programmes. This presents a great saving for applicants.

The following section in the data analysis presents the findings from the group interview conducted at the CAO.

The following section in the data analysis presents the findings from the group interview conducted at the CAO.

6.7.2 Group interview

This section presents the findings from the group interview conducted with four senior staff members at the CAO. It is important to note their views with regards to the CAS. The same sub-headings will be followed as with the interviews.

6.7.2.1 Understanding the Central Application System

The following are the perspectives from the staff at the CAO offices. The categories remain consistent with the information extracted from the interviews, except the perspectives change in some respects. The CAO is responsible for marketing, data capturing and communication to both students and universities.

Matrix 6-15: Central Application Office Respondents on Understanding the CAS

CATEGORIES	PARTICIPANTS' RESPONSES
IT systems and functionality	CAO has a 24-hour call centre with and IVR system for clients, which interrogates the system real time and gives feedback on various aspect of the application. R1 COM
	CAO captures applications and does data quality checks. R2 CAOM
	CAO provides accurate application information within the right timelines. R2 CAOM, R4 CITM, R1 COM
	Each time there is an update on the student's record, the CAO sends various communication to students, these systems generated letters or SMSs. R1 COM, R2 CAOM
	Universities do not have to capture application information and they do not have to upload the matric results. R4 CITM, R2 CAOM
	CAO has an e-communication department dedicated to addressing e-mail enquiries. R2 CAOM

Source: Researcher's fieldwork 2015 - 2016

Matrix 6.15 reflects that the CAO's service makes the application process convenient and affordable for students. The next section deals with the role of the CAO in the CAS.

6.7.2.2 The role of the Central Applications Office in the Central Applications System

The input-output model as indicated in the study's meta-theoretical framework assisted the researcher in capturing the role of the CAO in the CAS. In Matrix 6.16 the categories in the first column emerged as business processes of the CAO. The second column shows CAO input, the

third CAO output and the final column denotes the codes assigned to participants in the group interview.

Matrix 6-16: Input – Output Model of the Central Applications Office

BUSINESS PROCESS	CAO INPUT	CAO OUTPUT	CODE/S
Student recruitment and marketing	Career fairs	Bulk post the handbook to schools Run career fair/ exhibitions	R2 CAOM, R2 CAOM
Application process	Capture application information Upload the matric results	Provide accurate application information within the right timelines	R4 CITM, R2 CAOM
Communication with students	Send letters to students Send SMSs to students Send emails to students	Students receive acknowledgment letters as soon as the application is captured SMS sent each time there is a change in the record System triggers communication depending on the change in the record real time	R1 COM, R2 CAOM
Interaction with universities	Process and quality control the work within 15 working days	Meet our service level agreement which has a turnaround time for each institution	R1 COM
IT systems	Make sure that systems are up and running (internet and CAO system)	Student can access the system, for various use, apply online, check their application statuses Staff can use the system for selection purposes	R2 CAOM R4 CITM, R1 COM
	Offer IT support	IT support available via telephone call or SMS	R2 CAOM R4 CITM
	Upload and send output file of matric results to universities	Results are available for selection by universities	R4 CITM R2 CAOM
Customer relations	Train staff to use the system	Staff at institutions can use the CAO system	R4 CITM
	Assist with online support, and during registrations when needed	Resolved queries and institution registered students	R3 CAIM, R4 CITM
	Call centre with voice prompts, IVR system	Real time feedback on application status and information about the institutions	R1 COM

Source: Researcher's fieldwork 2015 - 2016

The input and output CAO model is an illustration of the CAO process. As Matrix 6.16 shows, the CAO sends letters to prospective students. Those who are unsuccessful can make alternative plans. These findings are very important as if students have to rely on the universities to give

them all the admission information, they will not have time to take up alternative offers. In the UK the response is also sent to students by UCAS, as indicated by Mullen (2011:8) that UCAS writes to all successful and unsuccessful applicants. What the CAS provides is the ability for the prospective student to monitor their applications on the CAO website. In other words, the meta-theoretical framework that includes the input-output-outcomes model guided capturing and analysing the data. In addition, the meta-theoretical framework helped drive an understanding of CAS efficiency as optimising students' satisfaction through conveniently available information and timeous responses, mainly through an online platform (Damanpour & Aravind 2011:426; Clinedinst 2008:9). The same is true about the assistance of the meta-theoretical framework in underpinning the meaning of effectiveness as the provision of quality service enabling the meeting of targets, and gaining information through high quality, consistent and reliable data (Blasch, Valin & Bosse 2010:1; Stewart-Weeks 2015:72).

The next section turns to the efficiency and effectiveness of the CAS from the perspectives of CAO staff members.

6.7.2.3 Efficiency and effectiveness of the Central Application System

This section introduces the perspective of the CAO interviewees regarding those factors that assist or facilitate the smooth running of the CAS process, and those that hinder it.

a. Factors facilitating the efficiency of the Central Application System

As per the CAO staff, Matrix 6.17 reflects the facilitators of the efficiency of the CAS. Factors that hinder the efficiency of the CAS process are then displayed in Matrix 6.18.

Matrix 6-17: Central Applications Office respondents on factors that facilitate the efficiency of the CAS

CATEGORY	CAO PARTICIPANTS' RESPONSES
Customer relations	CAO has various methods of giving application information to students. R2 CAOM, R2 CAOM
	CAO provides accurate application information within the right timelines. R2 CAOM, R4 CITM, R1 COM
	CAO has a 24-hour call centre with and IVR system for clients which interrogates the system real time and give, feedback on various aspect of the application. R1 COM
	Each time there is an update on the student's record, the CAO sends various commination to students, these systems generated letters or SMSs. R1 COM, R2 CAOM
	Call centre that functions with operators that can speak and understand all 11 languages. R2 CAOM, R1 COM
	CAO has user group meetings and training session for staff at institutions. R1 COM, R2 CAOM, R4 CITM, R3 CAIM:

Source: Researcher's fieldwork 2015 - 2016

It is important to note that while institutions have some challenges with the CAO, the CAO has its own perspective about the challenges with the current application process.

b. Factors hindering the efficiency of the Central Application System

For the CAO, it is important that the CAS process is clear for all involved, i.e. students, universities and themselves as the providers of the application service.

Matrix 6-18: Central Applications Office respondents on factors hindering the efficiency of the CAS

CATEGORIES	CAO PARTICIPANTS' RESPONSES
Operational clarity	Late and inconstant selection decision from faculties within the various institutions causes delays. R1 COM
	Dual processes at CAO and at the various universities create a problem, such as International students. Some UKZN deals with their own, when other Universities allow the CAO to process. R1 COM, R2 CAOM
	No standard practice for dealing with different categories of students. R1 COM, R3 CAIM, R4 CITM
	Students with regret statuses that want to be reconsidered after they have improved their marks on the final matric results are not reconsidered for admission. R2 CAOM, R3 CAIM
Customer relations	Students change their application ranking order because institutions consider only first choice applications. R2 CAOM, R4 CITM

Source: Researcher's fieldwork 2015 - 2016

Factors that facilitate the effectiveness of the CAO are presented next.

c. Factors facilitating the effectiveness of the Central Application System

On the one hand, factors that facilitate the effectiveness of the CAS are displayed in Matrix 6.17 for the category communication. On the other hand, factors the hinder the effectiveness is displayed in Matrix 6.18, for the category IT.

Matrix 6-19: Central Applications Office respondents on factors facilitating the effectiveness of the CAS

CATEGORY	CAO PARTICIPANTS' RESPONSES
Communication	CAO has a 24-hour call centre with and IVR system for clients, which interrogates the system real time and give, feedback on various aspect of the application. R1 COM
	E-communication department dedicated to addressing e-mail enquiries. R2 CAOM
	CAO has user group meetings and training session for staff at institutions. R1 COM, R2 CAOM, R4 CITM, R3 CAIM
	Each time there is an update on the students' record, the CAO sends various communications to students through system generated letters or SMSs. R1 COM, R2 CAOM
	Universities don't have to capture application information and they don't have to upload the matric results. R4 CITM, R2 CAOM

Source: Researcher's fieldwork 2015 - 2016

d. Factors hindering the effectiveness of the Central Application System

The CAO indicates a need to have an integration between themselves and the Enterprise Resource Planning (ERP) system that is used by both DUT and UKZN, ITS. Matrix 6.18 shows factors that hinder the effectiveness of the CAS.

Matrix 6-20: Central Application Office respondents on factors hindering the effectiveness of the CAS

CATEGORY	CAO PARTICIPANTS' RESPONSES
IT	The need to have integration between ITS and the CAO IT system. R2 CAOM, R4 CITM
	Some areas of KZN don't have access to internet. R1 COM
	There are people that have internet facilities and access but still prefer to be assisted at the CAO. R1 COM
	CAO has a 24-hour call centre with and IVR system for clients, which interrogates the system real time and give, feedback on various aspect of the application. R1 COM

Source: Researcher's fieldwork 2015 - 2016

Uckelmann, Harrison and Michahelles (2011:8) advise that information ensures that planning for action is supported by accessing information on a real-time basis. Therefore, this ability to have synchronised data can increase the effectiveness of operations. Both institutions and the CAO need to have information that is accurate and available to support the CAS. The fitness of the CAS from the perspective of the CAO staff is presented next.

6.7.2.4 Fitness of the Central Application System as an applications processing model

According to the respondents at the CAO, the implementation of the CAS should be done in hubs, as indicated in Matrix 6.19 below. While not losing site of the argument presented by Bethell & Zabulionis (2014:29) who indicates that the UCAS systems had complications and shows signs that it is not fit for the purposes it is intended. The authors advised that “the practical challenges of implementing a unified system for all UK providers of HE programmes would be considerable. However, it would be possible for a relatively small group of universities to set up their own common admissions system outside of UCAS” (Bethell & Zabulionis 2014:29). These contributions are indeed worth noting.

Matrix 6-21: Central Applications Office respondents on CAS fitness for South African HE

CATEGORY	CAO PARTICIPANTS' RESPONSES
CAS	CAS should be at a provincial level or in hubs. R1 COM
	Universities don't have to capture application information and they don't have to upload the matric results. R4 CITM, R2 CAOM
	Each time there is an update on the students' record, the CAO sends various communication to students, through system generated letters or SMSs. R1 COM, R2 CAOM
	Call centre that functions with operators that can speak and understand all 11 languages. R2 CAOM, R1 COM
Affordability	Applicants pay a single fee to apply for six programme choices at the institutions. R1 COM, R4 CITM, R3 CAIM
	Universities don't have to capture application information and they don't have to upload the matric results. R4 CITM, R2 CAOM
	Efforts that goes to the development of the CAO handbook to ensure that the students understand the information provided. R2 CAOM

Source: Researcher's fieldwork 2015 - 2016

The CAO is knowledgeable about the CAS' operation. Thus, the data in Matrix 6.19 as well as earlier matrices in this section can be viewed as a guideline for how the current application process can be improved. The foregoing matrices in this subsection also show how the government can successfully implement the Central Application Service for HEIs. This service is discussed in section 3.5.3 where the high-level model of the Central Application Service is displayed. The next section of the data analysis presents the findings from the two focus groups conducted at both DUT and UKZN.

6.7.3 Focus groups

For the focus group analysis, both data sets will be presented individually from DUT and then UKZN. The same sequence of headings will be followed for the focus groups, starting with an understanding of the CAS. Subsection 6.7.3.1 model's conversation analysis, while the other sections (6.7.3.2, 6.7.3.3 and 6.7.3.4) use the combination of content, matrix and thematic analysis. Conversation analysis aligns the emotions and actions that the participants exhibited during the focus group interaction as they agreed and disagreed with one another about issues that were raised. Such interaction is one of the distinguishing factors in a focus group as explained in Chapter Three (Roger & Bull, 1989; Onwuegbuzie *et al.*, 2009:5; Pour & Yazd, 2015:58).

6.7.3.1 Understanding the Central Application System

Unlike the other data sets, one subsection of the focus groups was analysed uniquely. That is this subsection on participants' understanding of the CAS. Here, the researcher used the conversation analysis method to display how participants in each group understood the CAS process. The data from DUT will be presented first, followed by UKZN. Each discussion is placed in a category so

that the context is not lost while appreciating the emotions that the group interaction and dynamic presented. The categories that emerged that assisted the understanding of the CAS from DUT's and UKZN's perspectives are highlighted by the actions and emotions that resonated with the conversation analysis.

a. Durban University of Technology

The categories below will be aligned to the responses from the participants to indicate respondents' understanding of the CAS process.

Matrix 6-22: Staff Perspectives about the CAO (DUT)

Modelling Conversation Analysis		
Category	Response	Actions and Emotions
Late applications	<p>FDP3: To add on that (<i>Laughs</i>) do you know why applicants don't apply in time?</p> <p>FDP3: Most of them they know that we are using eh June results so some of them they fail in June and they don't apply.</p> <p>FDP3: They only apply after.</p> <p>FDP2: Yes.</p> <p>FDP1: Ja.</p>	Joking
Selection process	<p>FDP1: Eh me I normally deal with the red colour coded. (<i>All laugh</i>) which are not met.</p> <p>FDP1: Yes eh I view the people that eh doesn't meet the requirements.</p>	Joking
	<p>FDP1: That's a very difficult one to answer because we weren't here back then but then so far I think everything is good.</p> <p>FDP1: Maybe she can answer for that. (<i>All laugh</i>) she has been here for more than 15 years. (<i>Reference is made to participant FDP5</i>)</p>	Sarcasm
Customer service	<p>FDP5: They have always done well.</p> <p>FDP1: Oh.</p> <p>FDP2 & FDP1: Yes.</p> <p>FDP2: Yes, satisfied</p> <p>FDP3: And their service is good too.</p> <p>FDP1: Yes, it is good.</p> <p>FDP5: You would call them and you have a query you know they solve the problem quickly.</p> <p>FDP2: Very prompt.</p>	Agreement

Cont.

Modelling Conversation Analysis		
Category	Response	Actions and Emotions
Customer service	<p>FDP2: And for our students eh I am not sure with regards to our students. FDP3: Mhm. FDP2: I am not sure. FDP5: I think... I think they are prompt because once you make an application your details are on the system, as soon as the institution makes a selection... FDP5: Obviously the status changes on the CAO and then... and then the applicant is able to view wherever they are (<i>Someone coughing in the background</i>) you can view your status on the system. FDP1: Yes they are prompt to the students.</p>	Debating
Access to technology	<p>FDP2: Would you believe it if I tell you that the first time that I used a computer was at DUT, fully use a computer. FDP2: It was at DUT when I was studying here, I didn't know what was going on before. FDP3: And you were scared of the mouse? FDP2: Ja. (All laugh)</p>	Joking
	<p>FDP2: Give me two forms I am taking for my cousin back home. FDP1: Yes. FDP2: I want to give them when I get there because I won't go back there. FDP4: Some are coming from Eastern Cape. FDP2: Yes, yes, yes.</p>	Agreement
Data quality	<p>FDP1: Eh me I normally deal with the red colour coded. (<i>All laugh</i>) which are not met. FDP1: Yes eh I view the people that eh doesn't meet the requirements. FDP1: Eh in that category there are people who... who sometimes there are people who meet the requirement but just because of eh maybe because of the capturing... FDP1: The capturing was wrong and other people in that category are people who are... FDP2: Still upgrading. FDP1: Still upgrading. FDP1: Some of them are upgrading and some of them are in matric so those people we have to put them in our waiting results.</p>	Repair
Processing timelines	<p>FDP2: So that we can view applicants from the CAO system, ja and it makes easier for the university to... to... FDP1: Handle the applications.</p>	Agreement

Source: Researcher's fieldwork 2015 - 2016

Matrix 6.20 confirms the indication of Onwuegbuzie *et al.*, (2009:5) that for qualitative rigour, using only text to provide themes in the analysis of focus groups can be limiting. Conversation analysis allows opportunity to provide information about consenting or dissenting views as well as a range of emotions. The range of emotions expressed during this focus group, such as joking, sarcasm, repair and agreement deepen the analysis of respondent perceptions (Pour & Yazd, 2015). The categories that emerge in matrix 6.20 are in line with the application processes that are followed when students apply at any of the universities that are using the CAO in KZN. On the one hand, DUT respondents show an appreciation of CAO tasks. On the other hand, upcoming

Matrix 6.21 suggests that the UKZN group was dissatisfied with data quality and indicated that their students are fighting them because of the issues raised. It is important to note that there is a general acknowledgement that most students applying in KZN do not have access to technology. This is troublesome as literature reveals that IT is relied upon by HEIs who competitively recruit students (Zhang and Hagedorn 2011:7; Liyanagunawardena, *et al.*, 2013:34).

b. University of KwaZulu-Natal

Participants from UKZN stressed issues related to the quality of data stronger than the DUT group.

Matrix 6-23: Staff Perspectives about the CAO (UKZN)

MODELLING CONVERSATION ANALYSIS		
Category	Response	Actions and Emotions
Document downloading	<p>FUP7: I think another thing could be the not dealing directly with the students the lack of documentation that we don't see in CAO and on the other hand students omit information where it missing here or it is fraudulent.</p> <p>FUP5: I agree with ... with regards to the information that is not provided to the application that is required time like these errors are major problems you know correct capturing of subject's results if it not CAO than other.</p>	Agreement
Data quality	<p>FUP7: I think another thing is the CAO they should be applying online themselves that is where the problem starts with the information missing they are allowed to apply and capture their own application even payment be still their part of application to support the application we should see everything complete.</p> <p>FUP8: They shouldn't be allowed to complete application without mandatory fields, it's like they don't have mandatory fields.</p> <p>FUP8: Yes, because that is a very huge...huge issue when it comes to the data capture errors which we should now fix after the registration process because now we get pages of reports with missing information there is basic stuff like ID number, race and those should be mandatory fields it shouldn't be allowed to capture the incomplete application unless there is none.</p>	Debating
Processing timelines	<p>FUP3: Ooh we don't have issues.</p> <p>I: And that is the general feeling everybody?</p> <p>FUP7, FUP8, FUP3, FUP1, FUP2, FUP6: Yes.</p>	Agreement
Customer service	<p>FUP5: I think in some cases where just say something wasn't captured there and then we haven't made a selection or we have withdrawn and that student doesn't qualify and the parent will pick up the phone and say I have come and handed the form we have queries like that we didn't give a place to.</p> <p>FUP5: The first person to pick up the call they will get the lash (<i>laughter</i>).</p>	Frowning

Cont.

MODELLING CONVERSATION ANALYSIS		
Category	Response	Actions and Emotions
Internal system cycle control	<p>FUP7: But the university I think (<i>laughter</i>) so it can be six months after those students have put in the application on that CAO because the student number hasn't been generated we can nothing to help the student with the CAO all of those problem is on our side.</p> <p>I: So you need more staff?</p> <p>FUP2: (<i>Loud</i>) No No No.</p> <p>FUP2: It's the efficiency of the system somebody need to press the button and run the programme. (<i>Laughter and talking simultaneous arguing</i>)</p>	Sarcasm
	<p>FUP7, FUP5: Yes.</p> <p>I: Are you all in agreement?</p> <p>All: Yes...</p> <p>FUP7: Very much. (<i>laughter</i>)</p> <p>FUP8: Most definitely.</p>	Agreement
IT systems	<p>FUP8: Their system is more user friendly than our system we can easily identify the applicants that meet requirements for our programmes comparing to ours.</p> <p>FUP8: Ours is a real manual check that we have to do.</p> <p>FUP6: And it's easy to make mistakes with our system and the CAO their system it much easier to do everything compare to our system.</p> <p>FUP8: (<i>interjecting</i>) you have to download three reports to check one thing. (<i>laughter</i>)</p>	Overlapping turn taking (
	<p>FUP5: The CAO system generally if everyone is using it very slowly putting the CAO number you can wait for 5 to 10 minutes. You have to close and restart.</p> <p>FUP7: That's our problem not CAO, our bandwidth was not big enough.</p>	Arguing
Data capturing and quality	<p>FUP7: Do you think the data capture is that bad?</p> <p>FUP8: Yes</p> <p>FUP7: Not a top student if doesn't know how to tick a box...</p> <p>FUP8: No their system does not have mandatory field.</p> <p>FUP7: I am sure they do have mandatory fields. (<i>arguing together</i>)</p> <p>FUP8: Here I understand if you could have seen that reports downloaded from the CAO.</p> <p>FUP8: That can be fixed, if they make mandatory fields.</p>	Disagreement and arguing

Source: Researcher's fieldwork 2015 - 2016

As Matrix 6.23 indicates, the emotions during the conversation ranged from debates to arguing to non-verbal frowns signalling disagreement to overlapping turn taking, to over-talking each other in addition to agreement (Pour and Yazd, 2015:59). The display of emotions not only suggests degrees of passion held by the participants about their work, but also seemed to shift the focus group to a learning experience among colleagues. The UKZN participants added a few additional categories to the ones offered by DUT staff, i.e. document loading as well as acknowledging that the university's internal systems also add to the challenges. The systems have to be compatible with one another in order to deliver an efficient and effective application process.

The following sections discuss the efficiency and the effectiveness of the CAS, according to focus group participants. The upcoming sections use a combination of content, matrix and thematic analyses to analyse the focus group data.

6.7.3.2 Efficiency and effectiveness of the Central Application System

This section will present the factors that facilitate the efficiency of the application process. DUT will be discussed first, followed by UKZN.

a. Factors that facilitate the efficiency of the Central Application System

The DUT participants indicated that the CAO provides prompt responses to students, despite the fact that they deal with all the applications for institutions in KZN. According to the CAO Annual Report, in 2014-2015, DUT received a total of 82,917 applications.

Matrix 6-24: Factors that facilitate efficiency (DUT)

CATEGORY	UNIVERSITY PARTICIPANTS' RESPONSES
Customer service	CAO have a good service and respond calls and queries promptly. FDP1 FDP2 FDP5
	CAO uses different coding system that clearly identify students meeting the criteria and those that do not. FDP1 FDP2 FDP3
	CAO offers prompt response to students. FDP1 FDP5

Source: Researcher's fieldwork 2015 - 2016

Matrices 6.22 and 6.23 clarify that both focus groups strongly perceive that the CAO offers both students and staff prompt customer service, which makes the process more efficient. Efficiency of the CAO and the CAS are essential to the application cycle (Dawson, Heathcote and Poole, 2010:117; Nelson, Quinn, Marrington and Clarke, 2012:88).

Matrix 6-25: Factors that facilitate the efficiency of the CAS (UKZN)

CATEGORY	UNIVERSITY PARTICIPANTS' RESPONSES
IT	CAO system is benefiting the university and it is user-friendly than the Internal ITS system. FUP8, FUP6
	Staff is satisfied with the responses going to students; they send them letters and SMSs. FUP1, FUP2, FUP4
Customer service	All participants agreed that the CAO meets their timelines. FUP7, FUP8, FUP3, FUP1, FUP2, FUP6

Source: Researcher's fieldwork 2015 - 2016

UKZN believes that the CAO's IT system is much better than the ITS system used by the university, thus providing more efficiency. The CAO's Annual Report (2014 -2015:29) indicates that, in 2015 it received 88,891 applications for UKZN, all of which needed responses. The fact that UKZN's ITS is less efficient than that of CAO is a pitfall as universities operate within

specific academic calendar dates and timeframes for admission processes (Mullen, 2011:8), which can be offset by ITS issues.

The factors that hinder efficiency of the CAS are identified next.

b. Factors that hinder the efficiency of the Central Application System

Several factors were identified in the Matrices 6.25 and 6.26 that hinder the efficiency of the CAS process, one of which was that the CAO gives information about the university criteria, however students still do not understand the admission requirements and this delays the process. Mullen (2011: 3) also highlights that the UCAS stipulates the information regarding courses and entrance criteria as for all qualifications. The internal university admissions process within the universities was emphasised by respondents in this study, noting that these challenges should not be misunderstood to be inefficiencies from the CAO, but rather the university. This is consistent with the study by Effah and Liu (2014:7) regarding the application process. That applicants complete the forms online and upload the supporting documents, then the web application process then transfers the data to various teaching department for review and make selection decisions. This is supporting efficiency in the application process.

Matrix 6-26: Factors that hinder efficiency (DUT)

CATEGORY	UNIVERSITY PARTICIPANTS' RESPONSES
Student results	Students don't understand the NSC admission requirements are confusing particularly to those that are used to the old Senior certificate. Some academics don't understand the NSC endorsement needs to be outlined to academic department. FDP5, FDP3, FDP4
	Students submit result that differ from the system and are fraudulent. FDP3 FDP4
	Staff don't get results of students that have upgraded. FDP1 FDP2
Post office	Post office strike affected the delivery of letters to students. FDP3
Walk-ins	Students wants to come personally to check their status because the Department delays to make selections and therefore the students don't get the application status. FDP1 FDP5
Operational clarity	No agreement with the faculties as to when to start working on the applications as a result student will not get response at the same time. FDP1 FDP4
	Students sometimes feel that they want to apply directly to the DUT and not the CAO as if they do not trust that their application will be processed. FDP1 FDP2
	Faculties within the university do selection in different ways. They do not consider applications that have selected the program as 1st choice, while others will consider all application choices. FDP1
Student recruitment	CAO does not reach the schools in rural areas with their marketing. FDP1, FDP5 FDP3 FDP2

Source: Researcher's fieldwork 2015 - 2016

Although the NSC mentioned in Matrix 6.24 is under criticism and questioned as a tool of admissions (Spaull 2013:5; Nel and Kistner 2009:58) the fact that it is not understood by staff and students tends to derail the CAS. Marketing strategies failing to reach potential students in rural

areas, as noted by a focus group participant, not only contributes to CAS inefficiency but also perpetuates the clear divide between pupils in the South African schooling system in terms of wealth, geographical locations and languages about which Badat (2010:2) complains.

Following the above analysis from DUT, UKZN indicated three categories within the applications process that hinder efficiency, namely customer service, processing timelines as well as data capturing and quality.

Matrix 6-27: Factors that hinder efficiency (UKZN)

CATEGORY	PARTICIPANTS' RESPONSES
Customer service	CAO call centre gives incorrect information at times thus frustrating the parents. FUP7, FUP8
	Clients fight with staff due to capturing errors that may affect selection offers. FUP5
	Students say they have submitted documents but the university would not have received the documents. FUP8
Processing timeframes	Delays in the admission process of transfer students due to missing documents, that are not yet downloaded by the CAO to the university system. FUP8
Data capturing and quality	Admin staff take long dealing with incomplete applications, where the data capturing was not completed by CAO. FUP2

Source: Researcher's fieldwork 2015 - 2016

As Matrix 6.25 reflects, students transferring from one university to another seem to be presenting a challenge, as the CAO does not provide the universities with all the required documents timeously, thus delaying UKZN's response to the client; they cannot finalise an admission decision if the data are incomplete. There are different categories of applicants and processes need to be aligned to these differences (Bahr 2012:96; Ishitani & McKitrick 2010; Kuh, Kinzie, Schuh; and Whitt 2011; Mullin 2012). Just as the CAO and the CAS carry out processes for first time entering students, additional action seems to be required to accommodate transferring students.

The next section deals with those factors that facilitate the effectiveness of the CAS, after which there will be a discussion on those that hinder effectiveness.

c. Factors the facilitate the effectiveness of the Central Application System

The DUT participants appreciate the flexibility that the CAS online system allows for students to apply online and conveniently register using the online service. Mahundu (2016:8) indicates that the Tanzanian CAS should be integrated with other systems that serve the same clients including loan application system. Uckelmann *et al.*, (2011:20) also indicate that data synchronisation supports online scenarios and different mobile platforms. Factors that facilitate the effectiveness of the CAS as per DUT are presented in Matrix 6.26, while Matrix 6.27 displays the factors that facilitate the effectiveness of the CAS according to UKZN.

Matrix 6-28: Factors that facilitate effectiveness (DUT)

CATEGORY	PARTICIPANTS' RESPONSES
Online service	Students that have applied through the CAO are able to register easily online so it is effective. FDP1 FDP2

Source: Researcher's fieldwork 2015 - 2016

For each focus group at DUT and UKZN, effectiveness of the CAS centred on student registration ease at DUT and application capturing at UKZN. Matrix 6.27 finds UKZN participants appreciating the fact that the CAO is giving some relief from capturing a large number of applications.

Matrix 6-29: Factors that facilitate effectiveness (UKZN)

CATEGORY	PARTICIPANTS' RESPONSES
Applications	University staff will not be able to cope with the number of applications to be captured by the CAO. FUP8, FUP6

Source: Researcher's fieldwork 2015 - 2016

These factors that facilitate CAS effectiveness also demonstrate the interaction between inputs, outputs and outcomes which are relative to the performance productivity of human beings (Stewart-Weeks 2015:72). The factors that hinder the effectiveness of the CAS from the focus group perspective are discussed next.

d. Factors that hinder the effectiveness of the Central Application System

To re-iterate, CAS effectiveness is referred to as the provision of quality service. It is important to understand how both institutions need to meet their targets, and to gain information through high quality, consistent and reliable data (Blasch, Valin and Bosse 2010:1; Stewart-Weeks 2015:72-73). Moreover, when HEIs set enrolment targets and fail to come within a two percent margin of those set targets, HEIs suffer financial repercussions. Identifying and removing hindrances to the efficiency and effectiveness of the CAS can assist HEIs in meeting targets set for student intake. In Matrix 6.28, the participants indicate that data quality is one of the challenges that institutions deal with, as unclean data negatively affects their reporting.

Matrix 6-30: Factors that hinder effectiveness (DUT)

CATEGORY	PARTICIPANTS' RESPONSES
Data quality	The national CAS will have increased workload and more data capturing errors, including wrong results thus affect the service to students. FDP2 FDP3 FDP4
Student results	Staff experienced challenges working on the CAO system as they don't separate those that are upgrading and those who completed matric. FDP1 FDP2
	Staff don't get results of students that have upgraded. FDP1 FDP2
IT	Online payment is an issue as some parents don't have credit cards and don't trust the online systems. FDP1 FDP4
	Applicants still need to submit academic application in a different system and have to apply for NSFAS financial aid using a different system. FDP5
	Access to technology is a serious matter, as some students have never seen a computer before, especially from disadvantaged communities and from rural areas. FDP2 FDP5

Source: Researcher's fieldwork 2015 - 2016

Decisions, and in particular selection decisions, rely on the data that are captured. Institutions get the results from the system to make offers to the students, thus if information is missing or not captured, this will have implications such as the institution losing clients to a competitor. According to Uckelmann *et al.*, (2011:10), projects have been suggested that provide information management and a system that provides "contextual information retrieval and interaction with the physical environment".

Matrix 6-31: Factors that hinder effectiveness (UKZN)

CATEGORY	PARTICIPANTS' RESPONSES
IT	CAO is slow during January. FUP3 FUP5 FUP1 although participant FUP7 indicates that it is the university internal system
	Internal system cycles are a problem would have captured that data however internal system controls will not be effected on the university side. In the meantime, the students are getting feedback from CAO. FUP2 FUP8 FUP7
	Not enough codes on the CAO system to identify different categories of students. FUP7
	Students applying online are omitting information themselves and not completing all fields. FUP7
Data quality	Data capturing errors where information is incorrect or missing, this has an impact on the downloading of matric results and institutions lose good students. FUP8, FUP5

Source: Researcher's fieldwork 2015 - 2016

The data in Matrix 6.29 confirms the argument of Blasch *et al.*, (2010:2) that the operating conditions or basis for effectiveness is information gain, which signifies high quality data and that data need to be consistent and reliable.

Perceptions of focus group members at each of the universities on the role of the CAO in the CAS follows next.

6.7.3.3 The role of the Central Applications Office in the Central Applications System

One of the questions that participants were asked, is the role that the CAO can play in the CAS implementation as indicated in Appendix 1. Participants indicated the responsibilities of the CAO and the fact that the CAO is an affordable way of applying to HE. Matrix 6.30 indicates the responses from DUT while Matrix 6.31 is a presentation of UKZN focus group participants.

Matrix 6-32: The role of the CAO in the CAS (DUT)

CATEGORY	PARTICIPANTS' RESPONSES
Customer service	The CAO is doing a good job; staff highly recommend it. FDP1, FDP2
CAO operations	The CAO captures information and the universities can get access to make selections. FDP2 FDP5
	CAO is a centralised office that deals with applications for institutions on KZN FDP5
	CAO charges a single fee which is making it cheap for parents, system works well has stats. Even the government can see how many matriculated have applied, met requirements. They can tell what happens to the student that did not meet the requirements. FDP5
Affordability	CAO charges one fee which makes it cheap for the parents FDP1 FDP2 FDP5

Source: Researcher's fieldwork 2015 - 2016

The next matrix indicates the UKZN focus group participants' view regarding the role of the CAO.

Matrix 6-33: The role of the CAO in the CAS (UKZN)

CATEGORY	PARTICIPANTS' RESPONSES
Customer service	Staff is satisfied with the responses going to students, they send them letters and SMSs. FUP1, FUP2, FUP4
	CAO provides good service to the university. FUP7, FUP5, FUP8
Resources	University staff will not be able to cope with the number of applications to be captured. FUP8, FUP6
	CAO process saves time to do applications and they are quite good. FUP5
	Centralised model is better, even though the university is not saving costs, as the cost of fixing all the errors may be too much. FUP8, FUP1

Source: Researcher's fieldwork 2015 - 2016

Both DUT and UKZN agree about what the purpose of the CAO is for both the universities and students. Within the application process, the CAO deals with the management of applications from recruitment to data capturing, and gives both staff and students feedback on the process.

In other words, the CAO implements the CAS in conjunction with other stakeholders, all pursuant to the overall Central Application Service that assists the DHET with planning for the supply and demand for post-school education. The CAS is intended to handle all applications for all first time entering students – those who apply timeously or through late applications (DHET 2016:17). For the national roll-out of the Central Application Service, CAO-like organisations would have to be

created to implement the CAS in different locales. The next section demonstrates focus group participants' perceptions as to the fitness of the CAS model for processing applications.

6.7.3.4 Fitness of the Central Applications System as an Application model

This focus group guide questioned the respondents as to whether the CAS is capable of managing the application processes efficiently and effectively, by providing an environment that allows for the capture of a large number of applications. As indicated in its Annual Report (2014-2015:8), the CAO provides the institutions with “a sTable system capable of handling the large volumes of applications and queries”. In 2015, the CAO processed 137,789 applications, with 88,107 hard copy and 49,682 online applications. Staff at both DUT and UKZN echo these sentiments.

In Matrices 6.32 (DUT) and 6.33 (UKZN) the categories of internet access, affordability of application fees and the relationship between the CAO and the CAS surfaced.

Matrix 6-34: Fitness of the CAS (DUT)

CATEGORY	PARTICIPANTS' RESPONSES
Access to internet	If CAS do away with paper applications and uses online application platform what happens to those that do not have access to internet. FDP1 FDP2 FDP5
	Registered students collect forms for their families at home therefore it would be better if it is regionally based to increases access. FDP1 FDP4 FDP2
	CAS maybe a challenge as a national office because sometime students want to go directly to CAO. FDP2 FDP3
Affordability	CAO offers one application fee payment for all institutions. FDP53

Source:

The CAO's Annual Report of 2014-2015 indicated that 60.4% of the applications were paper applications, which means that the CAS may have to address shortfalls in the provision of the online system in their attempt to increase access to HE.

Matrix 6-35: Fitness of the CAS (UKZN)

CATEGORY	PARTICIPANTS' RESPONSES
CAS	CAO system is effective and efficient more than the university's internal system. FUP3, FUP6
	CAO affects the key performance areas, which is offering efficient and effective service, in that if data is not captured correctly the students cannot get early offers. FUP8
Affordability	Amount of application fee needs to be reduced. FUP1

Source: Researcher's fieldwork 2015 - 2016

Van Staden (2013:3) mentions the value of applicants paying a single application fee in a centralised application system, which is not the case in a decentralised system. Chade *et al.*, (2014:974) confirm that the cost of applying through a common or central application service is more cost effective than applying at multiple institutions. Yet, despite the longevity of the UCAS

in the UK, as discussed in Chapter Three, Bethell and Zabulionis (2014:26) contend that the UCAS is disadvantageous for students as it goes against fair and effective principles. For example, the UCAS restricts student choices of institutions and makes offers based on provision or predicted results, which may falter, leaving students with offers revoked by universities. Simultaneously, in Australia, James *et al.*, (2009:9) contend that the centralised application-processing model is so entrenched that to decentralise the system would generate negative consequences, such as increased costs of labour and other complexities.

6.8 Chapter summary

The aim of this chapter was to present and interpret the qualitative findings of the study, however in order to do that effectively the case had to be put into context. The CAO, DUT and UKZN were placed in context to elucidate more information about the case – which is the CAS and the units of analysis being, DUT and UKZN staff and students. The results of the qualitative study were presented, and matrices were formulated to facilitate the qualitative data analysis process which is presented in the next chapter. The analysis of qualitative data was conducted through the use of content, matrix and thematic analyses. However, a component of the focus group data was shown using conversation analysis. These findings will be re-visited in the cross-unit comparative analysis and methodological triangulation in Chapter Eight. The quantitative results from the student survey are followed by the outcome of hypothesis testing.

CHAPTER SEVEN: QUANTITATIVE DATA PRESENTATION AND ANALYSIS

7.1 Introduction

This chapter presents the quantitative data from the survey conducted at DUT and UKZN, using descriptive and inferential statistics to analyse the composition of the sample using Stata 11.0. Descriptive statistics helped the researcher tabulate and summarise the larger data from the student survey (Holcomb, 2016). The study reports on the demographic profile of the sample of students at both DUT and UKZN respectively in terms of age, level of study, gender, ethnicity and province of origin. The descriptive statistics are discussed next.

7.1.1 Description of study population

A total of 157 females and 136 males participated in this study, with more female study participants (54.78% (n=86)) at DUT than at UKZN (45.22% (n=71)), as shown in Table 6.1. There were 44.49% (n=117) African study participants at DUT compared to 55.51% (n=76) at UKZN. No Coloureds or Whites at UKZN took part in the study. Almost half (49.51% (n=51)) of the study participants from DUT had matriculated from a township school, compared to 50.49% (n=52) at UKZN. The median age of study participants was 19 years, as indicated in Table 7.1.

Table 7-1: Description of study participants from DUT and UKZN

CHARACTERISTIC	DUT		UKZN		Total
	Total	%	Total	%	
Gender					
Female	86	54.78	71	45.22	157
Male	60	44.12	76	55.88	136
Race					
African	117	44.49	146	55.51	263
Coloured	11	100.0	0	0.00	11
Indian	11	91.67	1	8.33	12
White	6	100.0	0	0.00	6
Others	1	100.0	0	0.00	1
Province of origin					
Eastern Cape	11	68.75	5	31.25	16
Gauteng	9	64.29	5	35.71	14
KwaZulu Natal	116	48.13	125	51.87	241
Limpopo	3	60.00	2	40.00	5
Mpumalanga	4	40.0	6	60.00	60
Northern Cape	1	100.0	0	0.00	0
Northwest	1	50.00	1	50.00	2
Orange Free State	0	0	2	100.0	2
Western Cape	1	50.00	1	50.00	2

CHARACTERISTIC	DUT		UKZN		Total
	Total	%	Total	%	
Type of secondary school					
IEB	18	85.71	3	14.29	21
Model C	46	64.79	25	35.21	71
Rural	29	31.5	63	68.48	92
Township	51	49.51	52	50.49	103
Other	1	50.00	1	50.00	2
Year of study					
First	63	52.5	57	47.5	120
Second	68	55.74	54	122	
Third	7	53.85	6	13	
Age (Years) (Median, max, min)					
Overall					
19 (17,25)					

Source: Researcher's fieldwork 2015 - 2016

Understanding how students interpreted their experience of the CAO when applying is central to establishing the perceptions of students. The CAO was the point of contact to gain entry for both DUT and UKZN students.

7.1.2 Student perceptions of the CAS

This section examines student understandings and perceptions of the source of application information and the institutions' selection of students. The students indicated that the admission process continued to rely heavily on personal contact and paper, however, technology was being used in specific ways to make the process more manageable. For example, students used a variety of media to contact institutions with admissions enquiries, however, email and Internet seemed to be the most popular means of seeking information. According to Bontrager and Hossler (2014) and Schwartz (2004), online platforms such as websites and online application systems have been instrumental in application processes. The next part of the analysis deals with the efficiency and effectiveness of the CAS.

7.1.3 Efficiency and effectiveness of the CAS

Young people undergo complex multiple phases of processes until they ultimately decide which university to choose (Eidimtas & Valinevičienė, 2012:458). These decisions may also be influenced by how effective communication is with prospective students. User friendliness and an accessible Internet service can influence these decisions and the CAS seems to be meeting the mandate of communicating to students and giving the required information about their application status.

7.1.3.1 Efficiency of the CAS

Forty-two percent of study participants (n=126) utilised the CAO website when making their applications, whilst 27.7% (n=82) physically went to the CAO office to source application information, as depicted in Table 7.2. The median number of applications per study participant was one, the minimum and maximum number being one and seven respectively.

Table 7-2: Source of application access to internet and speed of the internet

CHARACTERISTIC	TOTAL NUMBER (N)	PERCENTAGE (%)
Source of application information		
Institution's website	22	7.43
Institution's open day	14	4.73
Went to the CAO office	82	27.70
Used CAO website	126	42.57
Word of mouth	42	14.19
Other	10	3.38
Access to internet		
Yes	157	53.04
No	139	46.96
Internet speed		
Fast	112	69.14
Slow	50	30.86
Median cost of application fees, Median, (min, max) R175.00, (R120.00, R6 500.00)	298	-
Number of applications, Median (min, max) 1 (1,7)	298	-

Source: Researcher's fieldwork 2015 - 2016

It is significant that prospective students used the website more than any other platform to obtain information. This study indicates the responses as depicted in Figure 7.1 that the CAS website provided adequate application information, similar to findings in studies by Eidimtas & Valinevičienė (2012:458); and Hagedorn (2011:8), who found that the CAO website provides a wide range of information for prospective students.

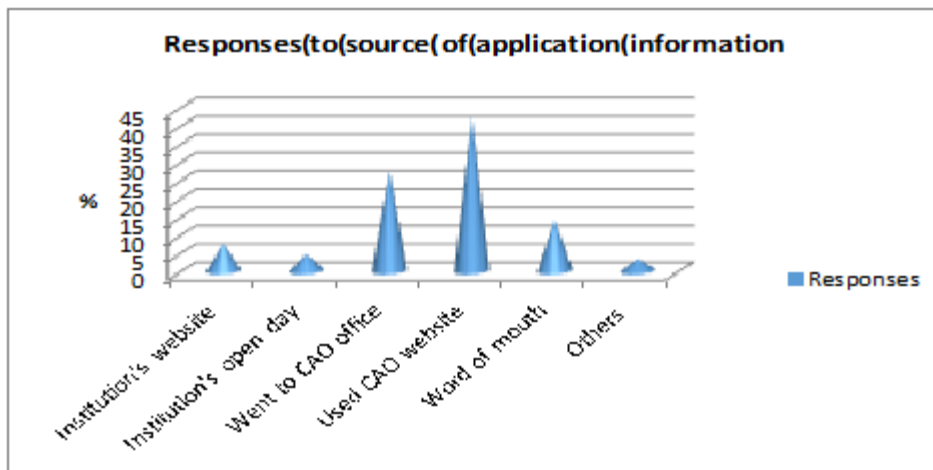


Figure 7-1: Distribution of responses to source of application information

Source: Researcher's fieldwork 2015 - 2016

In this study there was a strong association between speed of Internet service used at home and the number of applications study participants made. The P-value was 0.001, as shown in Table 7.3.

Table 7-3: Speed of the internet - Pearson-chi test

CHARACTERISTIC	TOTAL (N)	PEARSON-CHI	P-VALUE
Source of application information	290	6.52	0.268
Access to internet at home	290	0.43	0.510
Internet speed	161	10.26	0.001*

Source: Researcher's fieldwork 2015 - 2016

Students seeking entry into HE and their parents are now being seen as consumers (Furedi 2010; Molesworth, Scullion, Nixon 2010; Newman *et al.*, 2010:17). Students can search for meaningful information to select a specific institution (Newman *et al.*, 2010:17). Newman *et al.*, (2010:3) argue that it is convenient to have an online service as students entering HE just need to search for programs that meet their goals.

7.1.3.2 Factors facilitating an efficient Centralised Application System using univariate logistic regression

Study participants who agreed that CAS was an efficient system for applying to institutions of higher learning were 8.3 times more likely to agree that CAS offers adequate information during the application process than those who disagreed. Table 7.4 shows an assessment of whether CAS is an efficient system through a univariate logistic regression, while Table 7.4 reflects whether CAS is an efficient system using multivariate logistic regression. This relationship was statistically significant as the P-value was 0.000 at 95% confidence, as depicted in Table 7.4

Table 7-4: Assessing whether CAS is an efficient system through a univariate logistic regression

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
Offers adequate career information Disagree (Reference)		1		
Agree	242	8.3	3.26-21.53	0.000
Offers adequate career advice Disagree (Reference)		1		
Agree	168	6.2	2.01-19.02	0.001
Received application information timeously Disagree (Reference)		1		
Agree	214	4.2	1.84-10.96	0.001
Received feedback timeously Disagree (Reference)		1		
Agree	199	4.0	1.58-9.97	0.003
Application procedure clear Disagree (Reference)		1		
Agree	249	7.0	2.80-17.75	0.000
Website gives all information Disagree (Reference)		1		
Agree	208	4.0	1.65-9.83	0.002
CAS application hassle free Disagree (Reference)		1		
Agree	188	3.8	1.47-9.91	0.006
Received regular information Disagree (Reference)		1		
Agree	215	3.0	1.26-7.30	0.014
CAS service professional Neutral (Reference)		1		
Agree	206	3.8	1.56-9.24	0.003
Informed about the selection and admission decision process Disagree (Reference)		1		
Agree	226	3.4	1.38-8.44	0.008

Source: Researcher’s fieldwork 2015 - 2016

*A P-value of 0.05 or less means that observation is statistically significant at 95% confidence. The variable “D1” (see Appendix 7) was regarded as the dependent variable representing the outcome, whilst variables “C1” to “C10” were factors investigated to establish whether or not these independent variables were affecting the efficiency of the CAS model. The variables ‘C1’ to ‘C10’ were recoded as follows: “strongly agree” was changed to “agree”, and “strongly disagree” and “neutral” were changed to “disagree” to facilitate ease of analysis. Statistical significant relationships between CAS and the variables “C1” to “C10” were then assessed using univariate logistic regression. Relationships with P-values of 0.05 or less were deemed statistically significant, i.e. they influence CAS to be more efficient and were thus included in the final multivariate logistic model. Possible confounders and those variables with P-values of 0.05 or less from the univariate analysis were then assessed in a multivariate logistic regression using

the Stata command “xi:logistic”. All variables that had a P-value of 0.05 or less were deemed statistically significant, and the reason why CAS is efficient.

7.1.3.3 Factors facilitating an efficient Centralised Application System using multivariate-variate logistic regression

When conducting the analysis, the approach was to adjust for possible confounders, i.e. participants’ age, gender, type of secondary school attended and current university. At that point, there was a statistically significant statistical relationship between those who agreed that CAS is an efficient model of processing applications and that CAS provides adequate information during the application process. Those who agreed that CAS was efficient were 6.1 times more likely to agree that adequate information was provided during the application process, as per P-value (0.020). In addition, those who agreed that CAS was efficient were 12.1 times more likely to agree that the application process is very clear, as the P-value was 0.002. Furthermore, those who agreed that CAS was efficient were 12.1 times more likely to agree that CAS made the application process hassle free, as the P-value was 0.05 as depicted in Table 7.5.

Table 7-5: Assessing whether CAS is an efficient system to use for applications using multivariate logistic regression

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
CAO Offers adequate career information Disagree (Reference)	242	1		
Agree		6.1	1.32-28.39	0.020
Offers adequate career advice Disagree (Reference)	168	1		
Agree		2.4	0.47-12.27	0.293
Received application information timeously Disagree (Reference)	214	1		
Agree		1.09	0.23-5.22	0.916
Received feedback timeously (Reference)	199	1		
Agree		1.01	0.22-4.68	0.983
Application procedure was clear Disagree (Reference)	249	1		
Agree		12.1	2.52-58.04	0.020
CAS website gives all necessary information Disagree (Reference)	208	1		
Agree		5.2	0.98-7.67	0.050
CAS made application hassle free Disagree (Reference)	215	1		
Agree		4.3	0.79-23.23	0.093
Received regular update on application Disagree (Reference)	188	1		
Agree		0.4	0.08-2.25	0.311

Cont.

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
CAS provided professional service to clients		1		
Disagree (Reference)	206	0.3	0.05-2.11	0.248
Agree				
Informed about selection and admission decision process		1		
Disagree (Reference)	225	0.8	0.15-4.59	0.841
Agree				
Gender		1		
Female (Reference)	142	0.7	0.18-2.79	0.622
Male				
University		1		
UKZN (Reference)	146	0.4	0.079-2.14	0.291
DUT				
Type of Secondary school		1		
IEB (Reference)	72	0.3	0.02-5.11	0.422
Model C	94	2.1	0.12-34.71	0.614
Rural	108	1.9	0.11-35.35	0.654
Township				
Age category		1		
19 Years or less (Reference)	150	4.4	0.89-22.08	0.068
20 Years or older				

*A P-value of 0.05 or less means that observation is statistically significant at 95% confidence.

Source: Researcher's fieldwork 2015 – 2016

7.1.4 Effectiveness of the CAS

This section focuses on the effectiveness of the CAS while Table 7.6 reflects the univariate logistic regression model, Table 7.7 shows the multivariate regression model.

7.1.4.1 Assessing whether a Centralised Application System is an effective system to use for applications using univariate logistic regression

Students were satisfied that they did not need to contact CAS during the application process, and they believed that their choice to use CAS was a wise one. Using CAS made the application process easy for them, and they would recommend CAS to prospective students.

Table 7-6: Assessing whether CAS is an effective system to use for applications using univariate logistic regression

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
CAS offered effective service during application		1		
Disagreed (Reference)	210	6.3	2.44-16.30	0.000
Agreed				
Satisfied with the CAS system		1		
Disagreed (Reference)	201	19.1	5.45-66.93	0.000
Agreed				
No need to contact CAS at any time		1		

Cont.

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
Disagreed (Reference) Agreed	223	5.5	2.15-13.94	0.000
Satisfied with the application procedure Disagreed (Reference) Agreed	222	8.2	3.13-21.19	0.000
Preferred CAS to direct application to varsity Disagreed (Reference) Agreed	231	18.1	5.86-56.30	0.000
My choice of CAS was a wise one Disagreed (Reference) Agreed	242	20.5	6.61-63.77	0.000
CAS made the application easy for me Disagreed (Reference) Agreed	255	13.4	5.04-35.42	0.000
Recommend CAS to all HEI Disagreed (Reference) Agreed	244	30.9	9.87-96.48	0.000

*A P-value of 0.05 or less means that observation is statistically significant at 95% confidence.

Source: Researcher's fieldwork 2015 - 2016

The variable "D1" was regarded as the dependent variable representing the outcome, whilst variables "C11" to "C18" were factors investigated to establish whether or not they were affecting the effectiveness of the CAS model. For variables "C11" to "C18", the following changes were effected to facilitate ease of analysis, i.e. "strongly agree" was changed to "agree", and "strongly disagree" and "neutral" were changed to "disagree". Statistically significant relationships between CAS and variables "C11" through "C18" were then assessed using univariate logistic regression. Relationships with P-values of 0.05 or less were deemed statistically significant, i.e. they influence CAS to be more effective and were thus included in the final multivariate logistic model. Possible confounders and those variables with P-values of 0.05 or less from the univariate analysis were assessed in a multivariate logistic regression using the Stata command `xi:logistic`". All variables that had a P-value of 0.05 or less were deemed statistically significant and the reason why CAS is effective.

7.1.4.2 Assessing whether a Centralised Application System is an effective system to use for applications using multivariate logistic regression

After adjusting for possible confounders, i.e. study participants' age, gender, type of secondary school attended, and current university, those who agreed with the notion of CAS being effective were 6.7 times more likely to agree that CAS offered an effective service during the application process, as the P-value was 0.033 as depicted. In addition, those who agreed that CAS was

effective were 6.4 times more likely to agree that their choice to submit an application via CAS was a wise one, as the P-value was 0.04 as depicted in Table 7.7.

Table 7-7: Assessing whether CAS is an effective system to use for applications using multivariate logistic regression

CHARACTERISTIC	N	ODDS RATIO	CONFIDENCE INTERVAL	P-VALUE*
CAS offers effective service during application process	212	1	0.13-4.00	0.701
Disagreed (Reference)		0.7		
Agreed		1		
Satisfied with the CAS system	210	6.7	1.16-38.91	0.033
Disagreed (Reference)		1		
Agreed		1		
No need to contact CAS at any time	201	0.8	0.15-4.22	0.781
Disagreed (Reference)		1		
Agreed		1		
Satisfied with the application procedure	223	0.42	0.07-2.62	0.355
Disagreed (Reference)		1		
Agreed		1		
Preferred CAS to direct application to varsity	222	2.7	0.48-14.60	0.260
Disagreed (Reference)		1		
Agreed		1		
My choice of CAS was a wise one	231	6.4	1.08-37.56	0.040
Disagreed (Reference)		1		
Agreed		1		
CAS made the application easy for me	242	2.1	0.27-15.86	0.489
Disagreed (Reference)		1		
Agreed		1		
Recommend CAS to all HEI	244	3.1	0.42-21.61	0.271
Disagreed (Reference)		1		
Agreed		1		
Gender	142	1.3	0.29-5.55	0.754
Female		1		
Male		1		
University	146	0.5	0.12-2.80	0.493
UKZN		1		
DUT		1		
Type of Secondary school	72	0.4	0.02-5.97	0.477
IEB (Reference)	94	0.6	0.038-8.69	0.693
Model C	104	0.7	0.04-10.91	0.789
Rural		1		
Township		1		
Age category	150	1.8	0.41-8.22	0.421
19 Years or less (Reference)		1		
20 Years or older		1		

*A P-value of 0.05 or less means that observation is statistically significant at 95% confidence.

Source: Researcher's fieldwork 2015 - 2016

These findings dispute the importance of direct access to university websites, which Eidimtas and Valinevičienė (2012:460) found are frequently used sources of information. With the CAS, this study shows an indication that the central platform of information is where students eventually

apply, a convenient choice as they do not have to obtain information separately from the application service. Mahundu (2016:8) found that ICT was key in enhancing integration of the implementation of the CAS and essential, particularly for the applicants.

Most institutions put admission information on their web sites, making access to the process and information easier. This includes detailed admission information as well as online forms, allowing interested students to request and obtain information via mail, and post their applications online (Auddy & Mukhopadhyay, 2014:26; Heagney, 2012).

7.1.5 Fitness of the Central Application System as an applications processing model

The results for this statement indicate that 74 study participants strongly agreed that they were satisfied with the CAS process, of which 58.11% (n=43) were from DUT and 42.89% (n=31) were from UKZN. Of the 10 respondents who strongly disagreed that they were satisfied with CAS, 90% (n=9) were from UKZN and 10% (n=1) were from DUT, as depicted in Table 7.8. One hundred and five (35%) study participants, 54 from DUT and 51 from UKZN, strongly agreed that they preferred going to the CAS in person, whilst 36, 12 from DUT and 24 from UKZN, were neutral on this aspect.

Table 7-8: Study participants' satisfaction with CAS at DUT and UKZN

CHARACTERISTIC	SA	A	N	SD	D
Offered effective application process	52 (67.52)	70 (53.44)	16 (27.59)	0 (0.00)	6 (46.15)
DUT	25 (32.47)	61 (46.56)	42 (72.41)	6 (100.0)	7 (53.85)
UKZN					
Satisfied with CAS process					
DUT	43 (58.11)	77 (58.33)	18 (32.14)	1 (10.00)	4 (26.67)
UKZN	31 (42.89)	55 (41.67)	38 (67.86)	9 (90.00)	11 (73.33)
No need to contact CAS during application					
DUT	47 (60.26)	77 (65.81)	13 (30.95)	3 (15.79)	5 (16.13)
UKZN	31 (39.74)	40 (34.19)	29 (69.05)	16 (84.21)	26 (83.87)
Satisfied with application process					
DUT	43 (62.32)	84 (56.68)	8 (20.51)	2 (18.18)	2 (100.0)
UKZN	26 (37.68)	65 (43.62)	31 (79.49)	9 (81.82)	0 (0.00)
Prefer CAS than going physically to CAS					
DUT	54 (51.43)	70 (63.64)	12 (33.33)	5 (29.41)	1 (6.25)
UKZN	51 (48.57)	40 (36.36)	24 (67.67)	12 (70.59)	15 (93.75)
Going to CAS was a wise one					

Cont.

CHARACTERISTIC	SA	A	N	SD	D
DUT	53 (49.43)	73 (61.34)	14 (33.33)	3 (33.33)	0 (0.00)
UKZN	54 (50.47)	46 (38.65)	28 (67.67)	6 (67.67)	12 (100.0)
CAS process easy for me					
DUT	51 (51.52)	82 (60.29)	7 (25.93)	2 (33.33)	2 (12.50)
UKZN	48 (48.48)	54 (39.71)	20 (74.07)	4 (67.67)	14 (87.50)
I would recommend CAS to all higher institutions of learning					
DUT	61 (50.41)	73 (62.93)	7 (20.59)	2 (22.22)	2 (18.18)
UKZN	60 (49.59)	43 (37.07)	27 (79.41)	7 (77.78)	9 (81.82)

Key: SA=strongly agree, A=agree, SD=strongly disagree, D=disagree, N=neutral

Source: Researcher's fieldwork 2015 - 2016

The next section examines the testing of the hypothesis, which is a statement that specified the relationship between the efficiency and effectiveness of the CAS to determine if it is a fit model for HEIs.

7.1.6 Hypotheses Testing

The aim of the study was to investigate whether the study participants perceive CAS to be an efficient and effective system to use when applying to study at institutions of higher learning.

The null and alternative hypotheses are as follows:

Null: The CAS model does not bring efficiency and effectiveness to the application process.

Alternative: The CAS model does bring efficiency and effectiveness to the application process.

This study established that 92.4% (n=268) of the study participants agreed that they perceive the CAS to be an efficient and effective tool that one can use to apply for a place at an institution of higher learning in South Africa, compared to 7.6% (n=22) who disagreed as depicted in Table 7.9. Eighty-six percent (n=122) of the UKZN study respondents and 60% of the DUT (n=86) study respondents either strongly agreed or agreed that the CAS system offers an effective application process.

Table 7-9: Study participants' responses regarding their preference of using CAS

	Yes			No			Total (N)
	DUT	UKZN	Total	DUT	UKZN	Total	
Internet access	84(54.9)	69(45.1)	268(92.4)	59(43.4)	77(56.6)	22(7.6)	289
Is CAS efficient & effective?	138(51.5)	130(48.5)	153(52.9)	7(31.8)	15(68.1)	146(47.1)	290

Source: Researcher's fieldwork 2015 - 2016

Based on the empirical evidence the results failed to accept the null hypothesis, thus the conclusion was reached that the CAS system did bring efficiency and effectiveness to the CAS process. The CAS should therefore be used as the system for application to DUT and UKZN.

CAS's efficiency and effectiveness is measured by its ability to produce specific goals (Blasch *et al.*, 2010:1). As demonstrated by the meta-theoretical framework depicted in Section 4.7, CAO provides inputs in terms of the centralised application process. The CAS service comprises outputs by CAO. The outcomes, according to most university and staff respondents, are efficiency and effectiveness of the CAS service delivery. Semeon, Negash, & Musa, (2010:8) advise that "some of the characteristics which are considered as determinants of user satisfaction include: overall satisfaction, information satisfaction – difference between information needed and received, enjoyment, software satisfaction, and decision-making satisfaction." Though there are challenges with the CAS and the CAO, which this study brings out, they can be rectified before the CAS is rolled out across the South African HE landscape. The chapter summary follows.

7.2 Chapter Summary

The students' responses were presented in both descriptive and inferential statistical analyses.

In line with the methodology of the study, the results of the survey questionnaire for the quantitative study were presented. The analysis presented results of the student survey conducted with first and second year students at both DUT and UKZN. Stata 11.0 results from the surveys revealed a number of statistically significant relationships between the dependent and independent variables that influenced the use of CAS. These findings will be re-visited in the cross-unit comparative analysis and methodological triangulation in Chapter Eight. The next chapter will present a cross case analysis of data from the various units of analysis.

CHAPTER EIGHT: CROSS-UNIT COMPARATIVE ANALYSIS, TRIANGULATION AND EMERGING THEMES

8.1 Introduction

In the preceding chapter, data were presented in accordance with the data collection methods employed to develop a comprehensive overview. Specific sub-headings were formulated to help demonstrate achievement of the study objectives and answering of the research questions. In line with the post-positivist worldview, student respondent surveys showed that there is an objective reality about the efficiency and effectiveness of the CAS although that reality is imperfect. Moreover, the qualitative data indicate that staff have their own constructions about the CAO and the CAS.

In this chapter, the focus is particularly on a cross-unit comparative analysis of the data from staff and students at each university. It discusses paradigmatic, methodological and theoretical triangulation. This is in accordance to both the post positivist, pragmatic and constructivist worldviews. As indicated in Chapter Five, the CAS model is the case and the units of analysis are staff and students at DUT and UKZN. As shown in Chapter Six, DUT and UKZN provided the case context for the CAS model and the units of analysis. Section 8.2 delivers a comparative analysis of qualitative data whilst section 8.3 does so for quantitative data. Section 8.4 presents triangulation of multi-method qualitative data whilst section 8.5 reveals mixed method triangulation and section 8.6 paradigmatic triangulation, theoretical triangulation in 87. This chapter concludes by presenting themes emerging from the analysis process in section 8.8. Section 8.9 concludes this chapter with a summary of its contents.

8.2 Organisation of Comparative Analysis of Qualitative Data

The sections dedicated to qualitative data are organised consistently with the sub-headings used in Chapter Six except the application process. Section 8.3 presents comparative interview data followed by comparison of the focus group data across the two universities. There is no comparative analysis of the group interview of CAO staff since there was only one group interview conducted. Comparative Analysis of the Primary Qualitative Data

In this section, the comparison will be of the units of analysis, with focus on DUT and UKZN staff perceptions. As indicated previously, the same sub-headings are consistently used for all the analysis processes in line with the research objectives and questions. The categories that emerged

will be displayed in matrices under the related sub-headings. Comparative analysis of data is discussed in relation to the literature.

8.2.1 Understanding the Central Application System

From the interviews, it can be seen that there are a number of agreements regarding the respondents' perspectives about the CAS. Most comments were consistent at both DUT and UKZN, as depicted in the extract below. The staff at both DUT and UKZN know and understand the purpose of the CAO as far as the application process is concerned. Matrix 8.1, however, indicates the difference in opinions about the CAO regarding cost savings for universities.

Matrix 8-1: Different perceptions about the CAS - Interviews

SUB-CATEGORIES	PARTICIPANTS' RESPONSES	
	DUT	UKZN
Saving costs	DUT received 75,000 applicants thus far let's assume that we had to continue to get those number of applications eh it would take quite a massive infrastructure to deal with which would be costly for the institution in terms of staff. DDR1	The university is losing funds because they do not get the application fee while that money they could be getting as an institution. UDSA

Source: Researcher's fieldwork 2015 - 2016

A participant from DUT said that the CAO benefits them because they receive and administer many applications on their behalf. Therefore, this saves the university money. On the contrary, one UKZN participant felt that the money generated from application fees could be channelled to the university, and not to the CAO.

Matrix 8.2 reveals that participants hold common perspectives about the fact that the CAS process is not clear for students.

Matrix 8-2: Commonality in perceptions about the CAS process - Interviews

CATEGORIES	PARTICIPANTS' RESPONSES	
	DUT	UKZN
Operational clarity	The other challenge of course is that applicant behaviour is unpredictable; some applicants will indicate that they want to take up a space, but they <i>don't</i> because they have gone elsewhere or they have chosen another programme. DDR1	People must still be reminded that at UKZN you don't apply directly to UKZN, you apply via the CAO. The first thing and it may be confusing to some people because they are not familiar with it. UDSA Students do not understand the application process. UDSA CAS process is confusing to students. UDSA

Source: Researcher's fieldwork 2015 - 2016

Matrix 8.2 indicates clearly this confusion and the lack of clarity. Clarity in the process informs the fact that students will end up registering at the various universities, and therefore it is important that the CAS process is clear (Klasik, 2012:507). In the comparative analysis of the focus groups across the two universities, there is no deviation, regarding understanding the CAS. Therefore, there is no matrix comparing focus group data under this sub-heading. In the data presentation chapter, the researcher used conversational analysis to illustrate not only the interaction of participants in the group setting, but to also highlight the participants' understanding of the CAS process.

The next section deals with the role of the CAO in the CAS.

8.2.2 The role of the Central Applications Office in the Central Application System

The data reflect that all participants agree on data capturing, matric results and customer service, as depicted in Matrix 8.3. There is no confusion amongst the institutions as to the role of the CAO in the CAS process.

Matrix 8-3: The role of the CAO in the CAS

SUB-CATEGORY	PARTICIPANTS' RESPONSES	
	DUT	UKZN
Data capturing	The CAO assists with capturing of large number of applications that institutions do not have to deal with. DDR1, DAR1	The CAO assists with capturing of large number of applications that institutions do not have to deal with. UDSA
Matric results	CAO matches and upload the matric results from DOE, matches the university selection criteria, which makes it easy for institutions to track the application status online. DDR1, DAR1	CAO matches and upload the matric results from DOE, matches the university selection criteria, which makes it easy for institutions to track the application status online. USDA, UPAAO
Customer services	Follow up with students is done via the CAO, they send them a SMS and send them letters communicating the outcome of the applications. DDR1, DAR1	Follow up with students is done via the CAO, they send them a SMS and send them letters communicating the outcome of the applications, UDSA, UPAAO

Source: Researcher's fieldwork 2015 - 2016

Thus, regarding the role of the CAS, the findings suggest that the CAO has a clear mandate of managing the application processes on behalf of DUT and UKZN. Hence, CAO is analogous to the Victorian Tertiary Admissions Centre in Australia (Palmer *et al.*, 2011) and the Universities and Colleges Admissions Service in the UK (Mullen 2011:6).

As to the comparative analysis of focus groups, three categories are highlighted in Matrix 8.4 under the CAO's role in application processing. These are time-frames, data quality and customer service.

Matrix 8-4: The role of the CAO in the CAS - Focus groups

CATEGORIES	PARTICIPANTS' RESPONSES	
	DUT	UKZN
Customer service	Participants agreed that the CAO offers a good service and they are prompt in responding to students. FDP1, FDP2, FDP4, FDP5	Participants indicated challenges that clients fight with them due to information that the CAO did not capture or download which affected selection. FUP5, FUP7
IT systems	Participants felt that the CAO system gives them convenience with their coding systems. FDP1, FDP2, FDP5	Participants felt that the CAO system is more user friendly than their internal system. FUP6, FUP7, FUP8
Data Quality	Participants indicated that they pick up data capturing errors that affect the selection process. FDP1, FDP2	Data capturing error where indicated to be a challenge for the CAS process. FUP5, FUP7, FUP8

Source: Researcher's fieldwork 2015 - 2016

There is a clear indication of a difference in opinion as far as customer service is concerned, with UKZN indicating that customers are not happy when it comes to the implications of data capturing errors, which results in staff being seen as incompetent and unable to meet their deadlines.

Data, in particular administrative data, has been used to determine a number of patterns in HE (Chowdry, Crawford, Dearden, Goodman and Vignoles 2013:131). This assists institutions with making decisions about enrolment trends. Having accurate, reliable data means that the decisions based on that information will be accurate.

8.2.3 Efficiency and effectiveness of the Central Application System

The efficiency and the effectiveness of the CAS has been well articulated in Chapter Four, where the DUT and UKZN data where efficiency and effectiveness were discussed separately to indicate these facets. Here, the factors facilitating both concepts are discussed before the factors hindering each one. In terms of facilitating efficiency, taken as whole, the sub-categories that surfaced from all interview data were about communication and IT functionality (Matrix 6.11). Facilitation of effectiveness brought sub-categories of customer service, data analytics, data capturing and student recruitment (Matrix 6.14). The efficiency and effectiveness factors are interrelated. To return to Førsund's (2013a:4) definition of efficiency and apply it to these findings, communication and IT functionality by the CAS refers to outputs and means doing things right. Customer service, data analytics, data capturing, and student recruitment connects to Førsund's (2013a:4) definition of effectiveness which is doing the right things so that outputs are turned into outcomes.

When it came to those factors that hinder efficiency, shows consistent opinions from both DUT and UKZN interviewees regarding the incompatibility of IT systems between universities and CAO as a major problem. The second aspect is the fact that the structure of the participating institutions is different. Third, interviewees from each institution pointed out that many prospective students do not have access to the internet. One participant suggested that the schools should offer 3Gs to learners. Manual processes delay the response times, adding to the lack of efficiency in the application process. As to factors that hinder effectiveness. Different respondents indicated different types of timeframes across various stakeholders such as CAO, universities, students and the post office. These factors relate to the lack of timely communication.

CAO.

The fitness of the CAS as an applications processing model is discussed next.

8.2.4 Fitness of the Centralised Applications System as an applications processing model

The participants were asked to compare and contrast the CAS model alongside the decentralised model of applications, stating their preference. Matrix 8.5 presents these preferences by comparing and contrasting the differences between the two systems.

Matrix 8-5: Fitness of the CAS – Cross-university Interviews

DUT		UKZN	
The CAS system is far better; does not see any advantages with the previous system; and would never consider the decentralised model. DDR1	The CAO is very good and they have not taken any control away and the work well with institutions. DAR1	The previous banner system was not effective. CAO has definitely advanced in that regard with using IT to improve on how we look at things. Yes, definitely, definitely UPAAO	For me it is what works. Ja if it... the aim of the whole thing is for it to work. Eh I am easy with both as long as they work, the aim is to make it happen for... it's about the quality of service delivery. UDSA

Source: Researcher's fieldwork 2015 - 2016

Responses from all interviewees at each university generally indicate a preference for the CAO. However, one of the UKZN participants remained neutral and argues that the best system is the one that works, not necessarily the CAS or the university's decentralised system.

Matrix 8-6: Fitness of the CAS model - Focus groups

CATEGORY		PARTICIPANTS' RESPONSES	
Institution	DUT	UKZN	
Processing time frames	Participants indicated satisfaction with the time line further stating that the CAO is very prompt. FDP1, FDP2, FDP3, FDP5	Participant don't have issues with the CAO, they agree that the CAO meets the timelines. FUP1, FUP2, FUP7, FUP3, FUP6, FUP8	
Data quality	Participants indicate that for students that are upgrading their results are not captured. Secondly the capturing error of results can lead to a student not being admitted. FDP1, FDP2	Participants feel that applicants should not be permitted to do online applications due to the errors or missing information on the students' records. FUP8	
Customer service	Participants are happy with the prompt service that the CAO provides. FDP1, FDP2, FDP3	Participants indicate that due to data capturing errors or misinformation the customers are unhappy and fight the staff. FUP5	

Source: Researcher's fieldwork 2015 - 2016

Notably, UKZN showed positive feedback with regards to acknowledging that the CAO system is better than the internal system, however unlike DUT, UKZN felt that data capturing errors impact negatively on customer service and create delays in the selection process.

The findings that data capturing impacts negatively or causes customer dissatisfaction for both DUT and UKZN is a very good indicator of a causal connection where variables precede each other. When data are captured incorrectly, the clients/applicants will not be pleased. Functional IT systems ensure the efficiency in the application processes (Clinedinst 2008, Lauren 2008), therefore the CAS must have an optimal IT system that meets the client's requirements. According to Semeon *et al.*, (2010: 2) one of the ways of increasing efficiency and effectiveness is to invest on information systems this will also bring quality services to customers.

8.2.5 How can the CAS bring Efficiency and Effectiveness in the Applications Process for Higher Education South Africa?

The provision of an effective and efficient service is not only for the benefit of the DHET, but also for the institutions themselves and their stakeholders, staff and students, all of whom are part of a governance network. The DHET needs to ensure that service delivery is done in an inclusive and equitable way (Govender and Rampersadh, 2016:43). While these institutions need to ensure that students are admitted in the correct programs, and given the service that they deserve. This can be done taken to consideration the implementation of the CAS and consequently the support that institutions can be given in the use of this new phenomenon. As indicated in Oploski *et al.*, (2013:01) the measure of performance of public administration institutions in a network structure

is necessary. This section on the data analysis and presentation facilitates the measure of effectiveness for network organisation.

Matrix 8.7 CAS network frame-work and institutional relations

Sub-Categories	PARTICIPANTS' RESPONSES
Co-ordination	CAO responds and interacts well with staff. UDSA CAO has user group meetings and training session for staff at institutions. R1 COM, R2 CAOM, R4 CITM, R3 CAIM
Decision Making	The CAO that makes it decisions through a user group and steering committee as well as the board of directors of which the university is a part of so there's a consensus and all of those things and that are mutually agreed upon. DDR1 The CAO makes HEMIS reporting very easy for our MIS as Universities report to government on for example our gender, our race, our religion. DAR1

For Opolski *et al.*, (2013:101) this means that parts or nodes of the network are dependent upon, in various ways, on each other.” One part cannot function without the other and requires interactive support. For Follet, integration, and unity occur in groups occurs when there are genuine and authentic relations among members (Snider, 1998:275). In the context of the PSET-CAS it will therefore be a benefit that all actors are genuinely concerned about seeing the success of this project. Matrix 8.7 indicates that in this model, the CAO makes decision through a consultative process of interacting with staff at institutions through the user group platform. Public HEIs report to the department, student enrolment data and other information which may inform funding and other policy decisions to be taken (DHET 2017:12). In network environment Haynes (2015:18) acknowledges that the horizontal inter-department working requires that advice is by compromise and bargaining. This opposed to an authoritative approach. Arguing that “power is established through influence rather than formal authority” (Haynes, 2015: 18). The nurturing of these relationships will be guided by all actors involved to be professional. In this regard all process will yield effective results. According to Chettiparamb (2016:1295), in a complex system important characteristics that informs the final outcome are the working of feedback and the bottom-up approach. Flowerday, *et al.*, (2014:122) advises that “collaboration between institutions as subsystems can also play a vital role in the governance objectives of the HE system”. Therefore, establishing IT governance amongst stakeholders is of paramount important (Flowerday *et al.*, 2014:126; Mahundu 2016:8). Semeon *et al.*, (2010:6) further advises that organisations users need to be provided with necessary logistical and technical support.

Matrix 8.8 PSET-CAS - A complex system of Higher Education

CATEGORY	PARTICIPANTS' RESPONSES
Web based platform	Not enough codes on the CAO system to identify different categories of students. FUP7
	Students applying online are omitting information themselves and not completing all fields. FUP7
	CAO offers convenience of online application process. DDR1, UDSA, DAR1
Integrated approach	The use of completely different systems, there is no link to the NSFAS application there is no way to merge the two together. DAR1
	The CAO stores the application documents online; no physical documents are onsite. UDSA
	The university can trace the applications online and students can check the application status with the CAO. DDR1, DAR1, UPAAO,

The matrix 8.8 supports the above assertion that, an efficient and effective PSET-CAS, serious consideration must be given to ensuring that institutions (staff and prospective students) are given IT support, thus building confidence and confidence in using the CAS model for application management. Frederickson *et al.*, (2015:173) suggests that the ability of both individuals and organizations to process information is illustrated by how the Internet search engines functions. Teo *et al.*, (2013:2) suggest that the IT practitioner is “someone who designs, develops, operates, maintains, supports, services, and/or improves IT systems, in support of end-users of such systems”. And so IT functions fall within the scope of IT practitioners i.e. managing IT strategies, administration, development implementation, training and so forth to enhance delivery of service. In light of this argument, it will therefor ne a necessity for government to dedicate specific practitioners that will support the all users of the CAS. This will enable seamless use of this model of applications processing.

As indicated in (Best and Holmes 2010:147) confidence in the systems approach is important and therefore the CAS as method of applications processing need to be coordinated by all stakeholder involved. Participants are citing concerns regarding the fact that clients don't trust the system, they prefer to go directly to the institutions to have the queries resolve, this may need to be re-evaluated. Collaborative efforts should be made that both prospective students and parents appreciate what the system can do for them.

Matrix 8.9 Building confidence in the use of CAS.

CATEGORY	PARTICIPANTS' RESPONSES
Trust/ Confidence	There are people that have internet facilities and access but still prefer to be assisted at the CAO. R1 COM
	Online payment is an issue as some parents don't have credit cards and don't trust the online systems. FDP1 FDP4

In this section, network management is indicated as a possible solution for bringing efficiency and effectiveness in the applications processes. Consideration however still has to be made to all the factors that may influence that process be it positively or negatively. Just as it is indicated in O'Toole (2015:365) networks can be influential in shaping the processes, outputs, and outcomes of public action and they may contribute to public sector performance, however they may also cause disruption and increase conflict.

It is important to for the HE sector to constantly re-evaluate and reframe how the PSET-CAS can bring efficiency and effectiveness. To restate that argument by Klijn and Koppenjan (2000:137), 'network management' focuses more on mediating and co-ordinating inter-organisational policy making with the theoretical basis for such alternative view found in the network approach to policy and subsequently implementation. The next section is a cross-comparison of DUT and UKZN from the students' perspective.

8.3 Comparative Analysis of Durban University of Technology and University of KwaZulu-Natal Student Perceptions

This section quantitatively shows the comparative perceptions of student users of the CAS at DUT and UKZN. Eighty-eight (88) DUT and Fifty-one (51) UKZN study participants agreed that the CAS offers adequate career information to them, compared to two and six study participants who strongly disagreed or disagreed from DUT and UKZN respectively. Twenty-two (22) study participants from UKZN disagreed with the notion of receiving regular communication from CAS during the application process. As indicated in Table 8.1.

Table 8-1: DUT and UKZN student comparative perceptions of the CAS

CHARACTERISTIC	SA	A	N	SD	D
CAS offered adequate career information					
DUT	43	88	8	2	4
UKZN	38	51	36	6	15
CAS offered adequate career advice					
DUT	36	75	25	2	5
UKZN	16	36	58	7	24
Received application information on time					
DUT	45	72	22	4	0
UKZN	33	57	30	19	5
Call application feedback timeously					
DUT	45	73	15	3	7
UKZN	28	45	35	12	21
Application procedure clear					
DUT	50	80	11	1	3
UKZN	50	64	20	4	6
CAS gives all necessary information					
DUT	47	73	20	2	1
UKZN	28	55	44	3	2
CAS made application process hassle free					
DUT	42	73	17	2	8
UKZN	30	39	43	10	20
Received regular communication					
DUT	45	78	14	2	2
UKZN	29	58	22	14	22
CAS provides a professional service					
DUT	38	82	19	0	4
UKZN	28	55	40	6	16
Informed of the selection and admission decision process					
DUT	55	69	14	4	2
UKZN	42	54	26	9	11

Key: SA=strongly agree, A=agree, SD=strongly disagree, D=disagree, N=neutral

Source: Researcher's fieldwork 2015 - 2016

The aim of this study was to investigate whether study participants perceive CAS to be an efficient and effective system to use when applying to study at institutions of higher learning. Table 8.2 shows that just over half (51.5%) of the DUT student participants agreed that the CAS is effective, compared to UKZN's 45.1%.

Table 8-2: Student perspectives regarding their preference of application system and use of the internet

	Yes			No			Total (N)
	DUT	UKZN	Total	DUT	UKZN	Total	
Internet access	84(54.9)	69(45.1)	268(92.4)	59(43.4)	77(56.6)	22(7.6)	289
Is CAS efficient & effective	138(51.5)	130(48.5)	153(52.9)	7(31.8)	15(68.1)	146(47.1)	290

Source: Researcher's fieldwork 2015 - 2016

Edmunds, Thorpe & Conole, (2012:3) indicate a very close relationship between the ease of use of a system and how useful it is perceived to be. For students who participated in this study, the CAO provided hassle free application processes, hence they deemed the CAS to be efficient. Semeon *et al.*, (2010:6) advises establishing technical support centres is crucial for a particular system this will enhance user satisfaction and subsequently improves organizational performance. The methodological triangulation of the three qualitative data sets in response to the research questions and objectives is discussed in the next section.

8.4 Triangulation of Multi-Method Qualitative Data

The multi-method qualitative data encompassed the interviews, group interview and focus group interviews. This section of the study highlights the importance of triangulation. Here, the researcher's purpose is to determine whether findings obtained by different primary qualitative data tools are correlated and corroborated or divergent (Fusch & Ness 2015:1141). Triangulation under the sub-heading understanding the CAS model is next discussed.

8.4.1 Understanding the Central Application Systems model

Two categories that seem to be consistent in both institutions is that CAO's communication process with the students is efficient and they have a good IT system. All the participants agreed that the CAO updates students' application statuses and communicate with them via SMSs and letters communicating the outcome of their applications. This is displayed by triangulation of the three data sources as shown in Matrix 8.7.

Matrix 8-7: Comparative views on understanding the CAS - Multi-method qualitative data

CATEGORY	RESPONSES		
	INTERVIEWS	GROUP INTERVIEWS	FOCUS GROUPS
CUSTOMER SERVICE	Follow up on application feedback is done with the CAO, they are the ones that send students letters and SMS. DAR1, DDR1, UDSA, UPAAO	Each time there is an update on the student's record, the CAO sends various combination to students, these systems generate letters or SMSs. R1 COM, R2 CAOM CAO has an e-communication department dedicated to addressing e-mail enquiries. R2 CAOM	CAO have always done well. FDP5 And their service is good too. FDP3 Yes, it is good. FDP1 You would call them and you have a query you know they solve the problem quickly. FDP5 Very prompt. FDP2 Due to the capturing errors the first person to pick up the call they will get the lash (laughter). FUP5

Source: Researcher's fieldwork 2015 - 2016

Factors that hinder efficiency are modelled for the interviews, group interview and focus group interviews next.

8.4.2 Efficiency and effectiveness of the CAS

Three categories - data capturing, operational clarity and missing documents - indicated a difference in the perceptions of DUT and UKZN to those of the CAO. While both DUT and UKZN perceive the challenges to be with the CAO, the CAO indicated that they too experience challenges with the universities' operations.

8.4.3 Factors that facilitate the efficiency and effectiveness of the CAS model

There is general acknowledgement from all three sources of evidence that the CAS takes a large number of applications and captures them on behalf of the institutions. This allows institutions to receive statistical information that helps them manage the admission process.

8.4.4 Factors that hinder the efficiency and effectiveness of the CAS

A number of issues hinders the efficiency and effectiveness of the CAS application processes. However, what is common within all three qualitative data sets is the category of IT, as indicated in Matrix 8.8. All the participants indicated that the systems that are used at the universities should complement the CAS system. Matrix 8.8 triangulates the three qualitative data sets to model complementary views on factors that hinder the efficiency and effectiveness of the CAS.

Matrix 8-8: Complementary views on factors that hinder efficiency and effectiveness of the CAS - Multi-method primary qualitative data

CATEGORIES	PARTICIPANTS' RESPONSES		
	Interviews	Group Interview	Focus Group
IT	Majority of applicants have preference of paper based application than online application. DAR1, UDSA	There are people that have internet facilities and access that still but still prefer to be assisted by a staff member at the CAO. Some areas of KZN don't have access to internet. R1 COM	According to the CAO data there are more paper applications than online applications and that student still prefer paper submissions. FDP1 FDP2 Access to technology is a serious matter as some students have never seen a computer before especially from disadvantaged communities and from rural areas. FDP2 FDP5
	The IT systems used at universities needs to be compatibility of with that of the CAO system, the CAO system is slow especially during peak periods. UDSA, UPAAO	The need to have integration between ITS and the CAO IT system. R2 CAOM, R4 CITM	Applicants still need to submit academic application in a different system and have to apply for NSFAS financial aid using a different system. FDP5

Source: Researcher's fieldwork 2015 - 2016

While there is a general appreciation that the CAO captures applications for both DUT and UKZN, both institutions believe that it comes with a high cost of delays as a result of data capturing errors that are constantly seen by the admissions officers. This is shown in Matrix 8.9. As indicated in the forgoing sections, data capturing errors were identified as one of those aspects that the CAO needs to resolve.

Matrix 8-9: Divergent views on factors that hinder efficiency and effectiveness - Multi-method qualitative data

CATEGORIES	PARTICIPANTS' RESPONSES		
	Interviews	Group Interview	Focus Group
Data capturing and quality	Inaccurate information captured and by the CAO. If information is not available on the application record for selection by University staff which delays the process. UPAAO, DARI, UDSA	CAO provides accurate application information within the right timelines. R2 CAOM, R4 CITM, R1 COM	Admin staff take long dealing with incomplete applications, were the data capturing was not completed by CAO. FUP2
Operational clarity	CAO does not manage applications for transfer and International students well. UPAAO, UDSA	Dual processes at CAO and at the various universities creates a problem, such as international students. Some UKZN deals with their own, when other universities allow the CAO to process. R1 COM, R2 CAOM,	Delays in the admission process of transfer students due to missing documents that are not yet downloaded by the CAO to the university system. FUP8
Missing data	Some information is missing on the application record, such as IDs and this makes it frustrating for staff. UPAAO, DARI, UDSA	CAO captures applications and does data quality checks. R2 CAOM Universities don't have to capture application information and they don't have to upload the matric results. R4 CITM, R2 CAOM	Delays in the admission process of transfer students due to missing documents, that are not yet downloaded by the CAO to the university system. FUP8 Staff don't get results of students that have upgraded. FDP1 FDP2

Source: Researcher's fieldwork 2015 - 2016

The patterns that evolve in the difference of opinions from the universities (interviews and focus groups) *vis-a-vis* those of the group regarding the CAS are presented. As highlighted by Venkatesh *et al.*, (2013:25), these divergent findings may enrich the understanding and present an opportunity to re-evaluate the meta-theoretical framework and open different avenues of

enquiry that can be conducted in future. Fitness of the Central Applications System as an applications model is next discussed.

8.4.5 Fitness of the Central Application System as an applications processing model

In Chapter Six, the participants indicated that the CAO IT system is very good and easier to use than their internal system. Taken as whole, the findings indicate that the CAS is a fit model for applications processing, i.e. the CAS does have gaps, but these can be corrected or addressed. This answers the third research question and achieves the corresponding research objective.

8.4.6 Role of the CAS in bringing efficiency and effectiveness to applications processing for South African HEIs

As Hughes (2012:76) articulates “the public sector has inherent difficulties in measuring output or efficiency in production” this difficulty, (irrespective of whether by individuals or organisation), they permeate management as a whole. It is therefore important for HEIs in South Africa to ensure that the PSET-CAS is constantly evaluated to bring the anticipated outputs of an efficient and effective applications processing. Best & Holmes’s (2010:153) collaborative approach also indicates sensitivity to issues. The divergent view as indicated in matrix 8.9 have to be managed as they may interfere with the provision of service.

In the next section, the researcher presents the methodological triangulation from the mixed method approach. This is a comparative analysis of results from interviews, documents and survey data.

8.5 Triangulation of the Mixed Method Approach

Just as the previous section discussed triangulation from a primary qualitative multi-method perspective, this section considers triangulation for a mixed method point of view. Table 8.3 presents an overview of how mixed methods were used to adduce findings from the empirical evidence.

Table 8-3: Mixed method triangulation

QUALITATIVE PRIMARY DATA	QUALITATIVE SECONDARY DATA	QUANTITATIVE PRIMARY DATA
Research objective 1. Determine the perceptions of staff and students about the use of the Central Applications System (CAS) in the application processes at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN).		
The CAS service makes higher education affordable and accessible by offering one application fee.	Both DUT and UKZN received a number of applications from the CAO. The CAS service makes higher education affordable and accessible by offering one application fee (DHET 2016:12)	The CAO makes the application process hassle free, and more students use the CAO website to access application information.
Research objective 2. Discover the factors that facilitate or hinder the efficiency and effectiveness of the CAS.		
Both DUT and UKZN acknowledge the high standard of customer relationships that CAO provides to their clients, and their highly efficient and effective communication to students. Inconsistencies within the universities and the management of international and transfer students contributes to the lack of clarity in the CAS process.	The national central application service is intended to bring about efficiency and effectiveness in the application process for HEIs (DHET 2016:17). HE is more affordable and accessible by offering one application fee (DHET 2016:17, CAO Annual Report 2014/2015).	All variables that had a P-value of 0.05 or less were deemed statistically significant and the reason why CAS is effective. All variables that had a P-value of 0.05 or less were deemed statistically significant and the reason why CAS is efficient.
Research objective 3. Assess whether the CAS is a fit system for DUT and UKZN.		
Both DUT and UKZN appreciate the fact that the CAO provides them with easy access to information about the applicants, thus deeming the CAS model fit for HE institutions. Because of the volume of applications that both DUT and UKZN receive, the institutions benefit by saving costs and time as they do not have to capture all the application data.	Outside of KZN, in South Africa students are charged for each institution to which s/he is applying (Van Staden, 2013).	The one application fee for more choices benefits students.
Research Objective 4. Examine whether, and if so, how the CAS can bring efficiency and effectiveness to the application processes for HEIs in South Africa.		
Data quality and lack of compatibility and synchronisation between the CAO system and the university contributes to the ineffectiveness of the CAS process. The IT systems used at universities needs to be synchronised and compatible for effective operation of the PSET-CAS Collaboration in decision making through network management and network governance principles.	The CAS through the proposed Central Application Service is intended to support effective placement of students thus supporting efficiency in the application processes. (DHET 2016:14). Government can get access to valuable management information about the institutions from the CAO data. Institutions need to have enrolled around 950,000 students, while colleges enrol about 300,000 (NPC Vision 2030:320). The CAS can be effective in these applications to assist institutions to meet the national imperatives as indicated in the NDP.	Study participants indicated a general satisfaction with the use of the CAS for HEIs.

Source: Researcher's fieldwork 2015 - 2016

To an extent, Table 8.3 reflects validation of the findings from the primary qualitative and quantitative data. With regard to both customer service and IT systems, the participants in both the qualitative and quantitative components of the study indicated general satisfaction. However,

in the category 'data quality', data capturing errors were highlighted as a challenge that affects the selection process. James *et al.*, (2009:4) present a compelling argument that "tertiary selection processes are the source of disquiet and controversy around the world". Therefore, it is important that selection decisions are based on accurate data. The IT systems must support the process and customers must get correct information at all times, which will lessen the controversies in the selection processes.

Just as with the methodological triangulation, this information was juxtaposed with data given to the researcher from the CAO, DUT and UKZN. Paradigmatic triangulations follow.

8.6 Paradigmatic Triangulation

According to Khan (2014:299) that research paradigms "provide questions and puzzles to be revealed and interpreted". The paradigms contextualise the research framework used to understand the inquiry or problem to give some direction on how to solve the research phenomenon. The use of post-positivist, pragmatic and constructionist worldviews to frame this empirical study was justified in Chapter 5, section 5.2. While methodological triangulation presented in section 8.5 contributed to answering the study's research questions and achieving the objective. The blue print however that guided the research process is presents in this section, Table 8.4 which shows the role these paradigms and their underlying ontologies, epistemologies, and methodologies that assisted the researcher to answer the questions, and helped with the emerging themes that follows in 8.4 below.

Table 8.4 Paradigmatic triangulation of the CAS

Underpinnings	Constructivism	Post-positivism	Pragmatism
Epistemology	Transactional, subjectivists created findings	Modification, dualistic, objective, probable truth	Knowledge is pluralistic, central to group dynamics, communities
Methodology	Dialectical, constructed	Modification of experiments, falsifiable hypotheses, may include qualitative methods.	Experimentation, experience. Hypotheses or tools for guiding action rather than predictive rules, they contently evolving, not without basis, rather than predictive rules of cause and effect.
	Semi-structured interviews and group interviews	Test of the hypotheses, students' survey	Mixed method approaches
Ontology	Reality is relative, it is constructed	Reality is imperfectly and probabilistically	Reality is flexible, considerations of what works under the circumstances, observable

Adapted from (Biddle & Schafft 2015:323-325; Halcomb & Hickman, 2015:5; Lincoln *et al.*, 2011:167; Snider 1998:274)

This pragmatic approach can enhance the relations and interconnections of various network in HE. These varied worldviews can shape the implementation of the PSET-CAS considerably. This paradigmatic triangulation indicates that, in complex study, such as this one, the researcher need to intergrade all possible opportunities to evaluate the phenomena.

8.7 Theoretical Triangulation

The use of multiple theories in exploratory research on under-studied phenomena such as the CAS is important. It yields a more widespread picture of the complexities described in the literature review regarding the CAS that is under inquiry (Modell 2015:1139). In this study, a number of public administration theories were discussed and applied to achieve the study objectives, and test the null hypothesis presented in Table 1.1 in section 1.4. These theories are operationalised in detail in chapter four of the study, section 4.2 to 4.6. Furthermore, a meta-theoretical framework emanated from the operationalising of the varied public administration theories as shown in Figure 8.1.

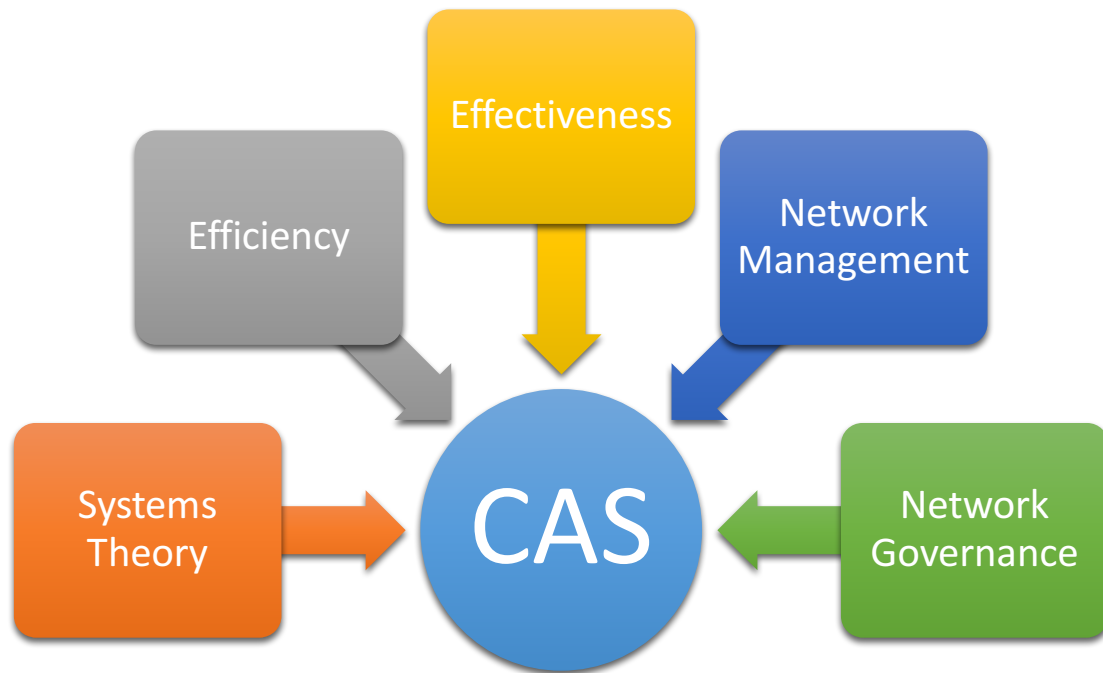


Figure 8-1 Theories Triangulated in the study.

Sources: Adapted from Blasch, Valin & Bosse, 2010:1; Chettiparamb 2016:195; Førsund, 2013a:4; Haynes 2015:22; Klijn & Koppenjan 2012:594; Kristof De Witte & Laura López-Torres, 2017:5; O’Toole, 2015:362.

Through this theoretical triangulation of the theories depicted in Figure 8.1, findings, conclusions and recommendations were drawn as shown in Chapter Nine. Therefore, HEIs can consider the recommendations and lessons learned from this study on the KZN-CAS model to address looming challenges in access to HE and applications processing when it comes to the upcoming implementation of the PSET-CAS.

The next section presents the themes that emerged from the data analysis process.

8.8 Emerging Themes from the Data Analysis

This section shows how the categories and sub-categories were refined into the major themes that emerged from the qualitative data analysis of the interviews, group interview, and focus groups. According to Beazley (2009:9), the emergent themes are related to those identified in the literature review chapters. From the participant feedback, research findings, and thorough analysis of the data, the meta-theoretical framework assisted to determine if the CAS model meets the outcomes or if the objectives are realised. In order for the themes to achieve full significance, they need to

be connected and form a clear, relevant picture. Table 8.5 presents the emerging themes from categories and sub-categories.

Table 8-5: Emerging themes from categories and sub-categories

CATEGORIES	SUB-CATEGORIES	EMERGING THEMES
Application processes	Student recruitment Data capturing Lack of clarity Processing timeframes Manual processes Late applications Selection process Matric results Types of students Communication	HE application processes
Data capturing	Capturing errors Data quality Data analytics Missing information	Integrity of student data
Resources	Saving costs Affordability Increased access CAO operations	Access and affordability
Customer relations	Customer service Customer feedback Communication	Applicants and students as customers
IT	IT functionality Internet accessibility Web based Platforms Communication Compatibility/synchronisation Internal system cycle control Online service Access to internet at home Internet speed	Information Technology protocols for CAS

Source: Researcher's fieldwork 2015 - 2016

The themes as established above are discussed in the following section.

8.8.1 Higher education application processes

As indicated in the literature review chapter, the application process is complex and has many considerations. The findings show that the general staff understand that the CAS manages all applications for undergraduate students on behalf of the universities, however according to the staff, the challenge is that students seem to be confused as to where the point of contact is between the CAS and the universities.

The second issue that seems to influence the process is the lack of clarity as far as the application process is concerned for transfer students from other universities and international students in undergraduate programmes. The findings indicate that some institutions prefer to deal internally

with these two groups, while other institutions route the process to the CAS. These inconsistencies with how to deal with transfer and international students is a definite frustration in the application process for both students and staff. This dual processing affects the efficiency and the effectiveness of the application process. In particular, UKZN administers this process internally while DUT routes the applications to the CAS, which creates confusion and affects students. Both CAS and the institutions do not address this complexity of transferring and international students well. It was found by Laanan, Starobin, and Eggleston (2010:178) that transfer students come with some complexities that need to be well managed. Clarifying the process for both students and staff is thus a need so that the CAS process is efficient and effective.

The study found that managing an admission office comes with specific operational costs, which can be offset by the fact that the CAS takes the financial burden away from the universities, saving them not only time, but money. This came out very strongly in the data sets. Auddy and Mukhopadhyay (2014:26) indicate that the expenses that universities incur were specified by, and that the universities do not have to use workers to do things that a central online service can provide. With the centralised system, staff do not have to collect filled-in forms from students, and do not have to manually scrutinise the data given in the forms against the documents submitted.

Even if universities still need to print application forms and brochures for walk-ins, they do not have to print for the majority. On the same note, the expenses that the universities incur were discussed by Auddy and Mukhopadhyay (2014:26), who argues that each institution spends money on printing the admission documents (application forms, brochure, etc.). At times the quantity is estimated and imaginary, as often no-one really knows how many applicants will arrive, thus wasting money on those that are not utilised. Managing and dealing with late applications is a challenge that needs further review and deeper analysis. The walk-in phenomenon has not been fully addressed by the CAS, as applicants still come to the gates of the institutions and the CAS.

8.8.2 Delays in the selection decisions

Two critical findings are apparent in the contributors to the delays in the selection processes - firstly, incorrect or missing data that are captured by the CAS, and secondly, the fact that the people tasked with making the selection and admission decisions do not do so timeously. This affects the process and contributes to the inefficiencies that need to be addressed. While some delays are said to be due to the fact that not all information is available on the CAO system for the universities to make decisions, the selectors within the institution also take their time giving

feedback to the admissions office and the CAO. The identified delay is also attributed to some missing and/or inaccurate application information, which will be discussed in the next section. The perceptions of staff and students at DUT and UKZN regarding the CAS for the application processes at both the institutions are indicated in the findings that they are satisfied with the provision of the application process using the CAS. They are aware of the gaps and challenges in the system, however believe that these can be addressed without reverting back to the institution-based application process.

8.8.3 Integrity of student data

Data quality and control were emphasised across all qualitative data sets, as improperly capturing data negatively influences the efficiency and effectiveness of the CAS. The data capturing process of the application information has to be done in the most accurate and reliable way. If data are not captured correctly it impacts on the seamless application process of the university, as it causes delays in the decision-making process because the information that is required to make the selection decision is missing or incorrectly captured (Clinedinst and Hawkins 2011:19; Nel and Kistner 2009:56). Students need to be contacted to submit this information, therefore students' backgrounds or biographical information is important for the universities to make admission decisions. Clinedinst and Hawkins (2011:18) denotes that one of the factors that influence a smooth application process is early decisions and the grades that the students have. For Frederickson *et al.*, (2015:174) "sorting and then processing information by preferences, priorities, and reliability are notoriously difficult; and even when well done, properly sorted information must still be interpreted." If information is not available, and accurate, the student can miss out of the opportunity to be selected and the university can lose that applicant.

Data analysis revealed that the CAS is very effective in providing useful information that allows institutions to make informed selection decisions. These decisions can assist institutions to meeting their enrolment targets. Through the CAS, institutions have access to data for analysis and for reporting to the department. Heagney (2012:67) notes that specific information about the background of students is used to make selection decisions in order to redress past injustices. A study by Van Barneveld, Arnold and Campbell (2012:2) highlights that different organisations, both businesses and HEIs, have common reasons why they use analytics, i.e. this information increases the financial and operational efficiency of an organisation. It also assists institutions to find funding models that respond to their specific needs while remaining accountable. Altbach (2015:8) indicates that at the centre of these academic enterprises is adequate funding and sustainability over a long period. These savings can be transferred to universities maintaining cost

effectiveness to support the academic functions. Therefore, information that is required for submissions to department for funding purposes must be credible to yield the best financial outcomes.

8.8.4 Access to, and affordability of, higher education

The other themes that emerged constantly in the data were access to, and affordability of, HE. This is the ability of every child to be able to gain admission to any institution or college. Most institutions put their application processes online, therefore the implication is that all applicants must have access to the internet. Students coming from disadvantaged backgrounds may thus be affected negatively, i.e. it was pointed out that students from rural KZN do not have access to the internet. With the unreliability of the post office, this may affect their chances of being admitted. Not having the financial capacity to afford to go to a HE institution is one of the barriers to access to education. Application fee payment is discussed next.

8.8.4.1 One fee for one application

For the CAS, a single application fee ensures that a student can get access to more than just one institution, thus increasing their chances of being admitted. One survey participant indicated that they had paid R6,500 in total for their applications; for applicants from low income families this can be interpreted as a hindrance to addressing access to HE. The study thus found that the CAS is beneficial and a fit model in terms of the current operations with the CAO at DUT and UKZN when it comes to affordability. This is consistent with what Mahundu (2016:7) found that the Tanzania CAS does indeed benefit applicants benefit in terms of costs and time and they can apply to various HEIs. Although the study by Ampilogov *et al.*, (2014:36) found that students have a different preference for limiting their applications to one institution without taking the advantage of more institutions for one fees. Thus limiting the options. Consequently, the one application fee to more institutions does will still be dependent on the preference of the individual applicant. The data below indicate that the CAS must be accessible to the to all prospective students irrespective where they are. Having in the CAS at national level may mean that applicants still have to endure the cost of sing the postal service, and are unable to get feedback on their application. Applicants as customers is discussed next followed by Information technology protocols.

8.8.4.2 Applicants and students as customers

Notably, applicants who apply to institutions, be it through the CAS or directly, require decent customer service. What came up in the study is that there is general confusion about the CAS

process, as some applicants are unsure where the contact point is, be it the CAO or the institution. Institutions cannot afford to lose potential students due to this lack of clarity. As far as general communication to students is concerned, however, the data reveal that the CAS process is efficient and effective. The CAO has systems in place that trigger information to students regarding various application statuses and general information that is required. The findings thus indicate that the CAS is able to meet the customers' needs. The participants who paid more in application fees are more likely to agree that the CAS is a better system to use; more than 60% of the study participants agreed that the CAS can be used for all HEIs in South Africa.

8.8.5 Information Technology protocols for CAS

Information Technology is at the centre of the CAS process, yet the findings indicate that the systems that are used for the process are not compatible, thus creating gaps in the flow of information, therefore availability of online platforms for prospective students needs to be established. The staff indicated that students want face-to-face contact with people to get assistance, which may be a challenge as so much investment has been channelled towards the online platforms. In addition, KwaZulu-Natal is one of the provinces that still need development in terms of technology; many students coming from rural KwaZulu-Natal do not have internet access, which is a problem for them if they need to submit online applications. Findings from the student data indicates that the CAS is a preferred model that brings efficiency and effectiveness to the application process. Students at both DUT and UKZN agree that the CAS can be used at the national level for HE application processing. In terms of the national CAS, IT will indeed play a big role in determining the success of the system to process the applications for the sector. It can be an enabler or a hindrance, especially in light of the political environment that South Africa is in. Notwithstanding the argument by Chetty (2014:90) that "poor students are further disadvantaged with regard to access to technology and resources – if they had Internet facilities, they would have been able to complete a virtual application to the university much more easily and much earlier, as opposed to crowding the gates when universities open in January, hoping to compete for a few last-minute seats". Hence the recommendation that the department makes available the mobile units that will reach applicants referred to by Chetty (2014:90).

Flowerday, *et al.*, (2014:122) advises that "collaboration between institutions as subsystems can also play a vital role in the governance objectives of the HE system". Therefore, establishing IT governance amongst stakeholders is of paramount important (Flowerday *et al.*, 2014:122; Mahundu, 2016:8). Semeon *et al.*, (2010:6) further advises that organisations users need to be provided with necessary logistical and technical support. Provision of mobile units is resonating

from the findings that some prospective students are from poor backgrounds, therefore in order to encourage them to apply, DHET needs to provide these mobile units. This support enhances satisfaction on the use of the system. The next section presents the proposed location of the PSET-CAS.

8.8.6 Proposed location of the PSET-CAS

The location of the PSET-CAS is equally important to support the access principle; therefore, the staff feel that the CAS should be based at either the provisional or regional level, not at the national level as anticipated.

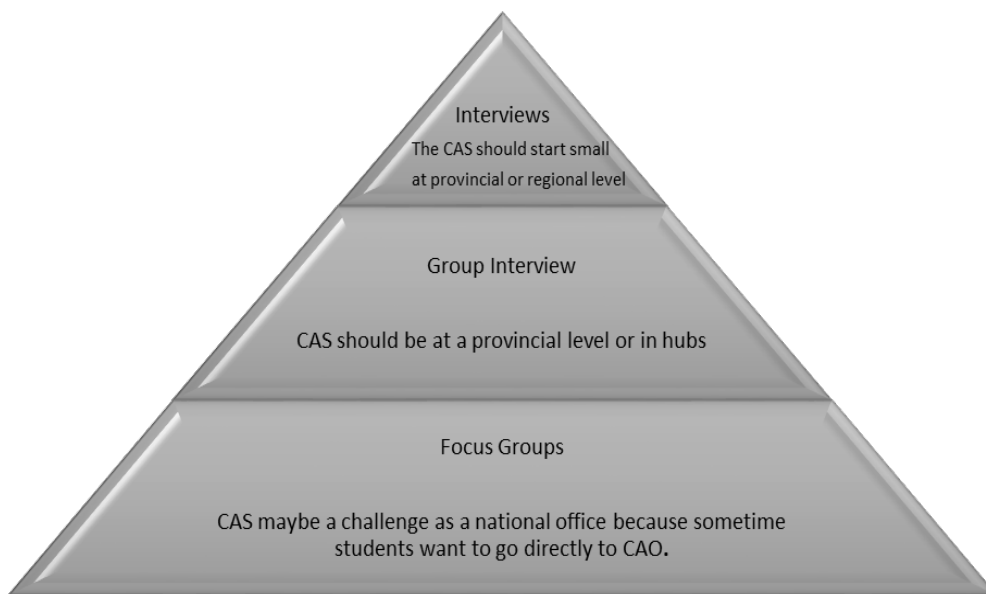


Figure 8-2: Proposal for the provision of and location of the CAS

Source: Researcher's fieldwork 2015 - 2016

The above findings are critical as currently the CAS is proposed to be implemented in the Gauteng province. According to the DHET policy for the PSET-CAS which was gazette in November 2017. The proposal proposed is that the CAS will be located in Gauteng, Tshwane. The rationale is that Gauteng hosts administration capital of South Africa and other key service partners such as CHE (Council on Higher Education), SAQA (South African Qualifications Authority), SETAs (Sector Education and Training Authority), and Quality Council for Trades and Occupations-QCTO (DHET 2017:15). In terms of rationalising the application process the set key partners should not be a justifying factor as students will be applying for placement at different institutions, including the ones in KZN, Eastern Cape, Mpumalanga and so on. Establishment of accessible point to submission of the application should be addressed as a matter of urgency, not phased in over time. The implication may be that prospective students based in Gauteng may have an

advantage in terms of accessibility over the others from other provinces. If the mandate is to inform adequate, accessible access to the sector the above finding as depicted in figure 7.1 should be vetted. This is very consistent with the study conducted by (Mahundu 2016: 8) about the Tanzanian CAS which made recommendations that the implementers “should set focal centres where assistance would be offered to applicants with less knowledge on IT at regional level especially during application season”. Thus, where the system is going to operate from will determine how effective the CAS methodology is. In the context of increasing access, Government will need to provide mobile units in areas where accessibility is a challenge (rural area, schools). This may also reduce the walk in phenomena.

8.9 Chapter Summary

This chapter provided a cross-unit comparative analysis for both DUT and UKZN, followed by triangulation, which enabled the answering of the research questions and objectives. The themes that emerged from the content and thematic analyses were attributed to the use of the CAS as an efficient and effective model. Although challenges were revealed, the findings suggest that the CAS brings efficiency and effectiveness to the application process, and is a fit model for processing the applications of undergraduate students in HEIs. Lessons drawn from these findings will contribute to the implementation of the CAS. Recommendations for CAS improvements will be presented in the chapter that follows, as will a summary of the findings, recommendations and conclusions have drawn from the empirical findings.

CHAPTER NINE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

This final Chapter presents a summary of the findings, conclusions and recommendations in light of the research questions and objectives. Once the research questions and objectives and the hypotheses are restated, a summary of the chapters highlights their contribution towards answering the research questions and achieving the research objectives. The outcome of the hypotheses is also stated, followed by a delineation of the findings and the conclusions drawn from this study, with an indication of the matrices in Chapters Six and Eight that led to these findings and conclusions. The policy implications are then noted and the significance of this study's findings as a contribution to the HE landscape is emphasised. Specific recommendations emanating from this empirical research about the CAS model are made in Section 9.8. In conclusion, this chapter makes recommendations for future empirical research that can be undertaken to broaden and contribute to the body of knowledge about the CAS phenomenon. The chapter summary finally brings this dissertation to a close.

9.2 Recapitulation of the Research Objectives and Research Questions

This study was set out to answer the following research questions and achieve the following objectives as indicated in Table 9.1.

Table 9-1: Research questions and objectives aligned and restated

RESEARCH QUESTIONS	RESEARCH OBJECTIVES
Research questions	Research objectives
What are the perceptions of staff and students about the use of the Central Applications System (CAS) in the application processes at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN)?	Determine the perceptions of staff and students about the use of the Central Applications System (CAS) in the application processes at the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN).
What are the factors that facilitate or hinder efficiency and effectiveness of the CAS?	Discover the factors that facilitate or hinder the efficiency and effectiveness of the CAS.
To what extent is the CAS model a fit system for DUT and UKZN?	Assess whether the CAS model is a fit system for DUT and UKZN.
How can the CAS bring efficiency and effectiveness to the application processes for HEIs in South Africa?	Examine whether, and if so, how the CAS can bring efficiency and effectiveness to the application processes for HEIs in South Africa.

Source: Researcher's work (2015- 2018)

9.3 Hypotheses Restated

The study posed the following hypotheses.

H₀: The CAS system brings efficiency and effectiveness to the application process

H₁: The CAS system does not bring efficiency and effectiveness to the application process

The null hypothesis was rejected in favour of the alternative hypothesis, which is that the CAS does bring efficiency and effectiveness to the application process. The statistical validity of the findings as indicated in Chapter Nine, may indicate firm support for the CAS to be replicated to all HEIs in South Africa. This validity informs the findings that the CAS is a fit model for all application processing, however this finding is more foundational than when generalisable. A small number of students participated and a limited number of types of post-school institutions were included in this study. The next section outlines the summary of the chapters and how the various chapters contributed to addressing the research questions and objectives.

9.4 Summary of the Chapters

9.4.1 Chapter One

This chapter introduced the focus of the study, provided the research background and the broad research problem, and highlighted the complexities that HEIs in South Africa are confronted with, with regards to the application management of undergraduate admissions. This introductory chapter gave a brief overview of the literature that is available on the CAS and the need to further embark on this empirical research to contribute to the body of knowledge about the applications process. The four research questions, objectives and the hypotheses were presented. The methodological framework used to aid the successful meeting of the study objectives was outlined. The overall purpose of this chapter was to provide the background to the research problem of the study.

9.4.2 Chapter Two, Three and Four

Chapter three reviewed the literature with the motivation to assess what was already known about the current challenges with the management of the application process, as well as public administration theories of measuring efficiency and effectiveness. These chapters helped the researcher to answer the second, third and fourth research questions. In addition, it was instrumental in providing a meta-theoretical framework that ultimately assisted with meeting all the objectives set in the study. The overarching motivation was to interrogate how the previous empirical studies dealt with the insurmountable complexities that the HEIs are facing with

regards to the application process. Most importantly, how can the proposed PSET-CAS assist with addressing these challenges? The literature review chapters assisted by providing the context within which the CAS was interrogated. In this regard, the history of the debate on issues of access to HE since 1994 was given. Both navigating access and complexities of the application process and public administration theories' chapters, facilitated the construction of the meta-theoretical framework that guided the achieving all four research objectives. This interrogation of the literature review was instrumental in confirming the stated research questions and informing the construction of the hypotheses which was subjected to testing.

9.4.3 Chapter Five

The chapter detailed the methodology that was used in the study, as well as the philosophical worldviews, research methodology and design. The mixed method research design was executed by a case study strategy and underpinned by post-positivist, constructivist and pragmatic worldviews. These worldviews kept the researcher grounded in the methodology applied to address the subsequent chapters. The data collection and analysis, including the statistical procedures utilised, were described. Furthermore, the chapter defined and justified the methodology used. Using qualitative and quantitative approaches, this mixed method study used triangulation for design, paradigms, data collection and analysis. This chapter detailed the entire research process, and informed the data analysis and interpretation that subsequently led to the study's findings and recommendations.

9.4.4 Chapter Six and Seven

The aim of these two chapters was to present and interpret the findings of the study. Firstly, the results of the qualitative study first, following a series of coding and content analysis. Matrices were used as a tool for the data analysis. The chapter dealt with the presentation of both primary and secondary data, and indicated how the hypothesis was tested. Quantitative data was analysed using uni-variate and multi-variate logic to test statistical significant relationship that ultimately led to the rejection of the null hypothesis for the alternative. These chapters contributed to answering the first research question as perceptions of both staff and students could be identified.

9.4.5 Chapter Eight

Chapter Eight, modelled a comparative cross-unit analysis and methodological and paradigmatic triangulation. The chapter presented a comparative analysis of how the staff view and understand the CAS by examining the different perspectives from the interview data, followed by the focus groups. The students' perspectives also highlighted the difference in how the CAS is experienced through their experience of the CAO. Triangulation of the mixed method approach was also presented by comparing information from all three data sets. Finally, this chapter displayed the methodological triangulation, whereby qualitative, quantitative findings and documents were presented in terms of how they aided achieving the research objectives. The chapter concluded with a discussion about the bigger theme that emerged, which assisted the researcher to conclude that the four research objectives were met and that the study had answered all four research questions.

9.4.6 Chapter Nine

Conclusions and recommendations emanating from the study are provided, and the implications of the research findings are discussed and limitations of the study are highlighted. This chapter provides policy implementation and presents a recommendation to be considered on the CAS model for applications processing and management. In addition, the chapter further suggests avenues for further research. Following intensive data collection, interpretation and analysis, recommendations are made from this research.

9.5 Summary of the Findings, Conclusions and Recommendations from the Research

In order to adequately present the findings and highlight how the research questions and objectives were achieved, the findings, conclusions and recommendations from the research are presented under each research objective. The order of the research objective will follow the sequence as presented in Table 9.1

9.5.1 Perceptions of DUT and UKZN staff and students towards the CAS

In order to determine the perceptions of the DUT and UKZN staff and students towards the CAS, the following two findings are presented.

Finding 1: The CAS process is not clear. Staff participants indicated that the CAS process can be confusing to students. The students do not know at which point they need to communicate with the universities or with the CAO. There is particularly lack of clarity regarding the processing of

transfer and international students. The lack of clarity is also evident in that within the universities there is no agreement regarding when to start giving the admission decisions to prospective students. See matrices 6.2; 6.11; 6.18; 6.26; 8.2 and 8.9.

Conclusion 1: This finding leads to the conclusion that establishment of clarity on the CAS process is vital, and admission decision times must be improved at the institutions.

Recommendation for finding 1: Clear guidelines about the application process must be widely communicated. Prospective students should not be left wondering about or where to get application feedback. These guidelines and instructions must inform both the staff and the student processes. All stakeholders in CAS need to agree on the application methodology for transfer and international student applications. Institutions need to improve their admission decision times to facilitate better efficiency so that the students can get timeous feedback about their applications.

Finding 2: This study established from the students' responses that the CAO offers adequate career information and career advice, and making CAS hassle free helps to make it more efficient and effective.

Conclusion 2: The one information centre model does contribute to the CAS being a preferred model and thus fit for HEIs.

Recommendation for finding 2: The CAS model should enhance its accessibility by ensuring that students are able to get application information conveniently.

9.5.2 Factors that facilitate or hinder the efficiency and effectiveness of the CAS

In order to discover the factors that facilitate or hinder the efficiency and effectiveness of the application processes, the following two findings are presented.

Finding 1: A strong indication shows that the institutions have a problem with the quality of data, as data are not captured accurately by the staff at the CAO, and some information is missing. This inaccuracy or missing information contributes to the factors that hinder the efficiency and effectiveness of the CAS process. See matrices 6.3; 6.12; 6.30; 6.31; 8.4; 8.6.

Conclusion 1: Data quality mechanisms needs to be put in place to ensure that the application data are captured as accurately as possible.

Recommendation for finding 1: Data integrity can be enhanced for institutions to get accurate data, and the government can get correct information for decision making. More platforms need to be created for students to validate their data and to ensure that the information captured is correct.

Finding 2: The CAO system is more user-friendly than the universities' internal systems. Related to this is the fact that there is a lack of synchronisation between the two systems, which impacts negatively on the CAS process. Refer to matrices 6.7; 6.8; 6.23; 6.31; 8.4; 8.8.

Conclusion 2: The use of different IT systems contributes to the inefficiency and ineffectiveness of the application process. The CAO uses visible colour codes to identify students who meet the criteria and those who do not. In this way, the institutions can track and trace applicants' movements within one system. The CAS system needs to be easy to use and have the ability to synchronise in order to enhance the efficiency and effectiveness of the CAS application process.

Recommendation for finding 2: Both the government and the HEIs need to do more research on an IT system that will address the challenges with IT that were raised in this study. Should the CAS go national, the institutions will need to deal with the IT challenges indicated in this study.

9.5.3 Assessment of whether the CAS is a fit system for DUT and UKZN

To assess whether the CAS is a fit system for DUT and UKZN, and subsequently a system that can be adopted at the national level to bring about efficiency and effectiveness in the management of application processes for HEIs, the following four findings are presented.

Finding 1: The study found that the CAS can be used as a data hub for both institutions. This finding is evident in matrices 6.6 and 8.7 that deals with management information.

Conclusion 1: The CAO's ability to produce statistical information for institutions to make decisions informs the fact that the CAS can support the HEIs' decision-making processes.

Recommendation for finding 1: The CAS data can effectively give institutions statistical information about the applicants, which can be used not only to identify possible patterns that positively inform their recruitment strategies, but can inform student support, success and acquisition of qualifications, as they know exactly where the students they admit are coming from and their backgrounds.

Finding 2: The study also found that the CAS is a cost-effective approach that benefits both institutions and students. The above can be corroborated on matrix 6.5.

Conclusion 2: The CAS methodology of processing applications will benefit both the institutions and the students. Universities do not have to put up the infrastructure to support these operations, and they do not have to employ additional staff for this administration. They also benefit from the marketing that is initiated on their behalf. In addition, the students pay just one fee for more application choices, and have one single point of information for admission to HE.

Recommendation for finding 2: The CAS application should remain as affordable as possible to encourage greater access to HEIs. The single application for more institutions and choices should remain.

Finding 3: The walk-in or late application phenomenon remains a challenge, as most students still come to both the universities of the CAO. Some participants indicate that this is due to the late selection time frames, as indicated in Matrices 6.22 and 6.26. Although the institutions remain responsible for how they deal with walk-ins, this issue persists.

Conclusion 3: This study cannot ascertain if the implementation of the CAS will address this phenomenon.

Recommendation for finding 3: More research needs to be conducted in order to understand the underlying problem of students not applying timeously.

Finding 4: Although there are challenges, the CAO does provide a good service to its clients. See matrices, 6.24; 6.33; and 8.4.

9.5.4 Examining whether, and if so, how can the CAS bring efficiency and effectiveness for HEIs in South Africa

Finding 1: The CAS is a good idea and is fit for HEIs. Students who participated indicated a general satisfaction with the use of the CAS for HEIs. This is further articulated by staff matrix in 6.11 and in the following matrices 6.21; 6.20; 6.30; 6.31.

Conclusion 1: The government needs to consider implementing the PSET-CAS at provincial level or in a hubs, and should expand slowly. This will assist with better management of the process and provide better controls in the application processes, particularly considering the fact that technology is still considered a factor that hinders some efficiency in the application process. Collaborative, bottom-up approach with all stakeholder will see the implementation of the PSET-CAS will be ideal.

Recommendation for finding 1: The roll-out or implementation of the CAS should be done at the provincial level, to allow proper management of any challenges that may emanate. This process should be managed and evaluated with public administration theories and principles to enhance efficiency and effectiveness in the public sector. The IT systems used at universities needs to be synchronised and compatible for effective operation of the PSET-CAS. This is consistent with research objective two, thus the same matrices can be referred to, see 9.5.2 above. Communication will be important for the success of this project, see matrices, 6.7; 6.10; 6.15; 6.16; and 6.19.

Conclusion for Finding 1: Collaboration in decision making through network management and network governance principles. Provision of internet facilities and support for perspective students will enhance the provision of good service and subsequent management of the applications processes.

The next section briefly discusses the policy implications.

9.6 Policy Implications

Even though public institutions remain autonomous when it comes to admission decisions, as public providers they remain liable to the government, thus public policy needs to address the inefficiencies. The service delivery mandate for HEIs needs to address the serious identified shortcomings, as they need to meet the national imperatives as identified in the National Development Plan. The provision of services needs to adequately address the efficiency and effectiveness principles. The implementation of a national CAS will mean that all HEIs have to re-evaluate their admission policies and processes to meet these needs, thus the admission requirements must be clearly outlined in the manner that is comprehensible to all stakeholders, particularly prospective students. This can contribute to the implementation of the CAS and hence this study will further make an inclusive recommendation that governance of IT should also include the use of the CAS by both government and HEIs. Public HEIs need to ensure the alignment of efficient and effective access with the public sector. The proposed model emanates from the findings and can be viewed a recommendation to which the CAS model can succeed.

The significance of the study findings is discussed next.

9.7 The Significance of the Study Findings for South African Higher Education Application Processing

The above findings indicate that the CAS application process is a preferred model at both DUT and UKZN, and can therefore be recommended for national implementation. Most importantly, these findings can inform the implementation of the national CAS. The proposed conceptual model for the implementation of the CAS echoes the participants view about the model and thus can contribute immensely to the implementation process. This study presented findings from an empirical process that subjected the CAO to scrutiny. Staff at the CAO, DUT and UKZN, as well as students from both institutions, contributed much valuable information about the CAO experience. Their perceptions further made valuable contributions to address possible gaps that still need to be looked into. As shown in the first chapter, the government intends to fully

implement the Central Application Service in 2019. The significance of this study's findings can provide HEIs with valuable information regarding the key challenges that still exist at each institution when students seek admission. Institutions will need to include the new application process methodology on their respective websites so that prospective students can align their interests with the new CAS system.

This study further sets a precedent for more research that can be undertaken to enhance the above findings. Recommendation for future studies are given in the next section.

9.8 Recommendations for Future Studies

This study makes the following recommendations for studies that can be undertaken to contribute to the knowledge gaps that this research could not fill.

Firstly, the issue of walk-ins or the late application phenomenon needs thorough research. Although participants voiced their suspicions as to why students still appear at the gate without applying, this study could not conclusively ascertain that the CAS is the solution to addressing the problem. The recommendation is that a future study be conducted that will only focus on why this phenomenon exists, and how to control adequately.

Secondly, studies can be conducted to see how other countries that have been using the CAS successfully to deal with the challenges that were highlighted in this study; example, the UCAS in the UK has the longest record when it comes to the provision of the CAS. An empirical study on the perspective and experience of UNISA would be useful, as they used the CAO and decided to stop using the model, this could deepen the scope on analysis. In addition, other post-school institutions such as TVET and private institutions that use the CAO can add valuable information regarding the CAS phenomenon. These investigations will inform how the CAS can be successfully implemented for the management of application processes of undergraduate students.

Thirdly, studies can be conducted, on provision of internet facility in rural areas to widen participation in HE. The participants indicated that some areas of KZN are still rural, and if the CAS is going to have a completely online application mode, then exclusions will be perpetuated.

Fourthly, empirical studies can be undertaken to evaluate how the PSET-CAS can operate guided by principles of public administration theories. This is a new phenomenon in South Africa and so further research can be conducted on how network management and network governance principles can facilitate the efficient and effective CAS, and subsequently address the challenges with the admission of undergraduate students to HEIs. This study can only provide analysis based

on DUT, UKZN on the use of the CAO in KZN, however an opportunity to test the provision on the CAS out of the boundaries of this province can be taken. This will indeed not only broaden the scope, but will be an opportunity to contribute to public sector management in HE.

Finally, future studies can look into how data from the CAS can be used to support student success. Institutions can maximise on this already available data to find patterns from the application information that tell stories about how each student is progressing. Each institution can use this information to adequately support them in class.

The chapter summary is next.

9.9 Chapter Summary

This chapter recapitulated the research questions and objectives, restated the hypotheses of the study, gave a synopsis of all the other research chapters, showed how each chapter contributed to achieving the research objectives, and answered the research questions. It further summarised the findings and the researcher's conclusions based on the set findings, and denoted the implications for policy, as this study was undertaken to inform how access can be achieved efficiently and effectively to public HEIs of South Africa. How the findings can contribute to public administration of admission of students was discussed, as well as how these findings can assist government to implement the PSET-CAS. Finally, this chapter gave recommendations for possible future studies.

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LIST OF APPENDICES

Appendix 1. In-depth interview guide – (DUT AND UKZN)

IN-DEPTH INTERVIEW PLAN AND QUESTIONS (DUT AND UKZN)	
Part 1: Introduction by the Interviewer	
<ul style="list-style-type: none"> • The researcher will open the interview session by introducing herself and asking the participant to introduce himself/herself. • The purpose of the interview, as well as the objectives of the study will be outlined. • The informed consent form will be explained and signed by the interviewee. • The investigator will also remind the participant regarding their rights during the interview session and, • Reemphasize that identities of all participant will remain confidential and their identity will never be revealed' 	
Purpose statement	Objective
<p>This study seeks to evaluate the users' perceptions on the Central Applications Service. This is in order to begin to see how this model is working at your university and to lay a foundation for ascertaining if this model is fit for the broader South African Higher Education landscape.</p>	<p>The objective of the study is to make contribution to the implementation of the CAS by exploring whether it is an effective model and solution to curb the current challenges engulfing the application processes of undergraduate students to post-school institutions in South Arica.</p>
Part 2: Question Session	
<ul style="list-style-type: none"> • Describe your position at the University. • Briefly outline your responsibilities with regards to the South African educational policy implementation at your University? • What were the reasons that prompted the adoption of the Centralized Applications System? • Probe: And how has this decision impacted on the University's admission processes? • What in your opinion are the current challenges with admissions of undergraduate students at universities? • How can these challenges be best addressed? Probe: To what extent are these problems/challenges addressed through the centralization process? Please explain. • What factors facilitate implementation of the CAS? • Did you work at your university before the CAS was implemented? If so, please compare and contrast the decentralised and centralised systems – indicating your preference. • What are your views regarding the current admission process? • Would you say that the centralization of all applications to the CAO the best way to deal with UKZN/DUT applications? 	

Part 2:Question Session

- Probe: Has the University considered the alternative method of processing applications?
- Do you still have students applying directly to the University?
- Probe: What are your views about that?
- What do you think about the tasks performed by the CAO toward implementation of the CAS?
- Thinking about how the CAS affects the running of your admissions office, what are your views on tasks performed by university staff members once applications are received by your university?
- What do you see as the outputs of the CAS? In other words, what does your university get out of the CAS?
- What do you view as the outcomes of the CAS?
- Probe: Please explain as to whether these outcomes are effective – why or why not?
- Please describe how the CAS works in terms of timeliness.
- Explain your thoughts about the CAS (and the CAO) in terms of value for money – in other words what is the extent of efficiency in that regard?
- What is the role of internet technology in the CAS?
- Probe: To what extent does internet technology lead to efficiency of the CAS in your view?
- How can internet technology improve the CAS? At the CAO? At your university?

Part 3:Closing Remarks

- The researcher will ask if participant have any additional comments that they may want to add.
- And close the interview session by thanking the participant for their valuable time and contribution to the study.

END

Appendix 2 Informed consent for interviews



School of Management, IT and Governance

College of Law and Management Studies

School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor: Dr F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

Dear Respondent

I, Salamina Segole am a Public Administration master's student in the School of Management, Information Technology and Governance, Discipline of Public Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled:

'A Case of the Centralized Applications System: Staff and Student Perceptions at Durban University of Technology and University of KwaZulu-Natal'

The aim of this study is to:

- Identify factors facilitating and hindering effectiveness and efficiency in the application processes.
- To determine the perceptions of DUT and UKZN staff and students towards the CAS.
- Assess whether the CAS is a fit system for DUT and UKZN.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from

participating in this research project. However, since you work at (Durban University of Technology/University of KwaZulu-Natal) your organisation may benefit from the findings of this study.

Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study. The interview will be recorded to allow you to listen to your responses after the interview and to assist the interviewer to capture your actual responses. Kindly indicate on the consent form whether you agree or disagree to have your interview recorded or not by ticking your choice.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about forty minutes to complete the interview questionnaire with me. I hope you will take the time to participate in the interview.

Sincerely

Investigator's signature: _____

Date: _____

This page is to be retained by participant



School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

CONSENT

I, _____ (full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I agree to allow my interview recorded.

I do not agree to allow my interview recorded.

Signature of Participant:

Date:

Appendix 3. Group Interview Guide – (CAO)

GROUP INTERVIEW PLAN (CAO)	
Part 1: Introduction by the Interviewer	
<ul style="list-style-type: none"> • The researcher will open the interview session by introducing herself and asking the participant to introduce himself/herself. • The purpose of the interview, as well as the objectives of the study will be outlined. • The informed consent form will be explained and signed by the interviewee. • The investigator will also remind the participant regarding their rights during the interview session and, • Reemphasize that all participant will remain confidential and their identity will never be revealed 	
Purpose statement	Objective
This study seeks to evaluate the users' perceptions on the Central Applications Service. This is in order to begin to see how this model is working at your university and to lay a foundation for ascertaining if this model is fit for the broader South African Higher Education landscape.	The objective of the study is to make contribution to the implementation of the CAS by exploring whether it is an effective model and solution to curb the current challenges engulfing the application processes of undergraduate students to post-school institutions in South Arica.
Part 2: Question Session	
<ul style="list-style-type: none"> • Why was the CAO created and by whom? • How many people are currently employed by the CAO? • Could you please define your position at the CAO? • Briefly outline your responsibilities with regards to the application process for the institutions in KwaZulu-Natal Province? • What in your opinion are the current challenges with admissions of undergraduate students at South Africa universities generally? And universities or post=school institutions in KZN province? <ul style="list-style-type: none"> Probe: How would these challenges possibly be addressed? Probe: Would you say that any of these problems/challenges are being addressed by the CAO? Which ones? • What are your views regarding the current admission processes in South Africa, nationally? • What factors facilitate the CAS? • What type of applications system best serves the country in general and higher education stakeholders in particular? • How do you deal with what we commonly refer to as “walk ins”? • Probe: Do you still have students applying directly to the University? 	

Part 2:Question Session

- Probe: What are your views about that?
 - What tasks are performed by the CAO toward implementation of the CAS?
 - What do you see as the outputs of the CAS? In other words, what does your staff members produce?
 - What do you view as the outcomes of the CAS?
Probe: Please explain as to whether these outcomes are effective – why or why not?
 - Please describe how the CAS works in terms of timeliness.
Probe: What is benchmark of timeframes sought once an application is filed with the CAO.
 - Explain your thoughts about the CAS (and the CAO) in terms of value for money – in other words what is the extent of efficiency in that regard?
 - What is the role of internet technology in the CAS?
Probe: To what extent does internet technology lead to efficiency of the CAS in your view?
How can internet technology improve the CAS? At the CAO? At the Universities?
 - Please explain your satisfaction or lack of satisfaction with the CAS.
 - How can the CAS be improved?
 - Do you think the CAS should be implemented throughout South Africa? Why or why not?
Please explain?

Part 3:Closing Remarks

- The researcher will ask if participant have any additional comments that they may want to add.
- And close the interview session by thanking the participant for their valuable time and contribution to the study.

END

Appendix 4. Informed consent for group interview



School of Management, IT and Governance

College of Law and Management Studies

School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor: Dr F.A.Ruffin (076 811 9595)

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- Assess whether the CAS is a fit system for DUT and UKZN.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from

participating in this research project. However, since you work at (Durban University of Technology/University of KwaZulu-Natal) your organisation may benefit from the findings of this study.

Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study. The interview will be recorded to allow you to listen to your responses after the interview and to assist the interviewer to capture your actual responses. Kindly indicate on the consent form whether you agree or disagree to have your interview recorded or not by ticking your choice.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about forty minutes to complete the interview questionnaire with me. I hope you will take the time to participate in the interview.

Sincerely

Investigator's signature: _____

Date: _____

This page is to be retained by participant



School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor: Dr. F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

CONSENT

I, _____ (full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

I agree to allow my interview recorded.

I do not agree to allow my interview recorded.

Signature of Participant:

Date:

Appendix 5. Focus groups guide

FOCUS GROUP GUIDE	
Part 1: Introduction by the Interviewer	
<ul style="list-style-type: none"> • The researcher will open the focus group session by introducing herself and asking participants to introduce themselves. • The purpose of the focus group, as well as the objectives of the study will be outlined. • Informed consent forms will be distributed, read aloud and signed. • The investigator will also remind the participants regarding their rights to withdraw during the focus group session and, • Reemphasize that identity of all participants will remain confidential and their identity will never be revealed. 	
Purpose statement	Objective
This study seeks to evaluate the users' perceptions on the Central Applications Service. This is in order to begin to learn how this model is working at your university and to lay a foundation for ascertaining if this model is fit for the broader South African Higher Education landscape.	The objective of the study is to make contribution to the implementation of the CAS by exploring whether it is an effective model and solution to curb the current challenges engulfing the application processes of undergraduate students to post-school institutions in South Africa.
Part 2: Preliminary Question Session	
<ul style="list-style-type: none"> • Were you working with admissions processes and procedures prior to introduction of the CAS? If so, kindly compare and contrast your experience with the former decentralised and current centralised applications process. • With regard to the current applications process, what would you say are the admissions challenges that your institution is confronted with? 	
Part 3: Question Session	
The questions in section 3A will be first discussed followed by the questions in section 3B Then questions in Section 3C will be first discussed followed by the questions in Section 3D	
3A. Questions relating to staff attitudes about the CAO	3B. Questions relating to staff satisfaction on the CAO
<ul style="list-style-type: none"> • What is your opinion regarding the service provided for by the CAO to this University? Please explain • Does the CAO meet your timelines in terms by providing feedback to the University? Why or why not? • How do CAO services affect your job responsibilities? 	<ul style="list-style-type: none"> • Is the CAO in your opinion benefiting the University with the application process? Please explain. • Would you say you are satisfied with the response time that the CAO provides your university? • To what extent are you satisfied? • If satisfied, why are you satisfied?

3A. Questions relating to staff attitudes about the CAO	3B. Questions relating to staff satisfaction on the CAO
<ul style="list-style-type: none"> • How could services provided by the CAO to your university be improved? 	<ul style="list-style-type: none"> • If you are not satisfied, why not?
3C. Questions relating to staff attitudes about the CAS	3D. Questions relating to staff satisfaction on the CAS
<ul style="list-style-type: none"> • What factors facilitate implementation of the CAS? • What factors hinder implementation of the CAS? • Describe your attitude toward the tasks performed by the CAO toward implementation of the CAS. • Thinking about how the CAS affects the running of your office, describe your attitude toward the tasks performed by university staff members once applications are received by your university. • What do you see as the outputs of the CAS? In other words, what does your university get out of the CAS? • What do you view as the outcomes of the CAS? • Please explain as to whether these outcomes are effective – why or why not? 	<ul style="list-style-type: none"> • What factors facilitate implementation of the CAS? • What factors hinder implementation of the CAS? • Please describe how the CAS works in terms of timeliness. • Explain your thoughts about the CAS (and the CAO) in terms of value for money – in other words what is the extent of efficiency in that regard? • What is the role of internet technology in the CAS? • To what extent does internet technology lead to efficiency of the CAS in your view?
Part 3: Closing Remarks	
<ul style="list-style-type: none"> • The researcher will ask if participant have any additional comments that they may want to add. • And close the interview session by thanking participants for the valuable contribution to the study END 	

Appendix 6. Informed consent for focus group



School of Management, IT and Governance

College of Law and Management Studies

School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor: Dr F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

Dear Respondent

I, Salamina Segole am a Public Administration master's student in the School of Management, Information Technology and Governance, Discipline of Public Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled:

'A Case of the Centralized Applications System: Staff and Student Perceptions at Durban University of Technology and University of KwaZulu-Natal'

The aim of this study is to:

- Identify factors facilitating and hindering effectiveness and efficiency in the application processes.
- To determine the perceptions of DUT and UKZN staff and students towards the CAS.
- Assess whether the CAS is a fit system for DUT and UKZN.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this research project. However, since you work at University of KwaZulu-Natal, your organisation may benefit from the findings of this study.

Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study. The Focus group will be recorded to assist the interviewer to capture all responses.

Kindly indicate on the consent form whether you agree or disagree to have the Focus group interview recorded or not by ticking your choice.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about one hour to complete the interview with me. I hope you will take the time to participate in the interview.

Sincerely

Investigator's signature: _____

Date: _____

This page is to be retained by participant



School of Management, Information Technology and Governance
Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

CONSENT

I, _____ (full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that am at liberty to withdraw from the project at any time, should I so desire.

I agree to allow for this focus group to be recorded.

I do not agree to allow this focus group to be recorded.

Signature of Participant:

Date:

Appendix 7. Questionnaire



Research Title: ‘A Case of the Centralized Application System: Staff and Student Perceptions at Durban University of Technology and University of KwaZulu-Natal’

Section A: Biographical Information and Academic Profile

In this section of the survey, the researcher seeks to find out biographical and Academic background about you. This information will have bearing on results and will only be used for research purposes only.

Please tick the appropriate box with an X

A1	Gender	
	Female	<input type="checkbox"/>
	Male	<input type="checkbox"/>

A2	Age	
	How old are you?	<input type="checkbox"/>

A3	What is your race (Ethnicity)?	
	African	<input type="checkbox"/>
	White	<input type="checkbox"/>
	Indian/ Asian	<input type="checkbox"/>
	Coloured	<input type="checkbox"/>
Other Specify	<input type="checkbox"/>	

A4	Which Province are you from (Home Province)?	
	Kwazulu-Natal	<input type="checkbox"/>
	Gauteng	<input type="checkbox"/>
	Northwest	<input type="checkbox"/>
	Northern Cape	<input type="checkbox"/>
	Mpumalanga	<input type="checkbox"/>
	Limpopo	<input type="checkbox"/>
	Eastern Cape	<input type="checkbox"/>
	Western Cape	<input type="checkbox"/>
Orange Free State	<input type="checkbox"/>	

A5	What type of secondary school did you matriculate from?	
	Government School - Township	<input type="checkbox"/>
	Government School – Rural Area	<input type="checkbox"/>
	Government School – Model C	<input type="checkbox"/>
	Private School – IEB	<input type="checkbox"/>
Other specify	<input type="checkbox"/>	

Please complete

A6	Please state which university you currently studying with	
A7	In which year are you currently in?	

Section B: Application Information

The purpose of this section of the survey is to find out about factors facilitating or hindering the CAS.

Please tick the appropriate box with an X

B1	How did you source out application information about your choice of institution?	
	Institutions Website	
	Institutions Open days	
	Went to the Central Applications Office (CAO)	
	CAO website	
	Someone told me about it	
	Other	

B2	Did you have access to the internet at home when you made an application to CAO?	
	Yes	
	No	

B3	If answer to B2 above is yes, how was your internet speed?	
	Fast	
	Slow	

Please complete

B4	On average what was the cost (R) of all application fees you spent combined?	R
-----------	---	----------

B5	How many applications did you submit including the CAO office?	
-----------	---	--

Section C: Central Application System (CAS).

In this section, the researcher would like to find out your experience with regards to service received from the Central Application System (CAS).

Across from each of the entries below in the shaded area to the right, indicate the level to which you agree or disagree with the statements below by ticking the appropriate box with an X.

SCALE DESCRIPTION				
Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5

Your overall attitude regarding the Central Application System (CAS)

C1	The CAS offered adequate career information	Strongly disagree	1	2	3	4	5	Strongly agree
C2	The CAS offered adequate career advice	Strongly disagree	1	2	3	4	5	Strongly agree
C3	I received all application information on my application timeously	Strongly disagree	1	2	3	4	5	Strongly agree
C4	I received all application feedback on my application timeously	Strongly disagree	1	2	3	4	5	Strongly agree
C5	The application procedure was clear	Strongly disagree	1	2	3	4	5	Strongly agree

C6	The CAS website gives all necessary information	Strongly disagree	1	2	3	4	5	Strongly agree
C7	The CAS made the application process hassle free	Strongly disagree	1	2	3	4	5	Strongly agree
C8	I received regular communication informing me of what will follow with my application	Strongly disagree	1	2	3	4	5	Strongly agree
C9	The CAS provided a professional service to applicants	Strongly disagree	1	2	3	4	5	Strongly agree
C10	I was informed about the selection and admission decision process	Strongly disagree	1	2	3	4	5	Strongly agree

Your overall satisfaction regarding the Central Application System (CAS)

C11	The CAS offered effective service during my application process	Strongly disagree	1	2	3	4	5	Strongly agree
C12	I was satisfied with the CAS process.	Strongly disagree	1	2	3	4	5	Strongly agree
*C13	I did not need to contact the CAS at any given time during my application	Strongly disagree	1	2	3	4	5	Strongly agree
C14	I was satisfied with the application procedure that the CAS offered	Strongly disagree	1	2	3	4	5	Strongly agree
C15	I preferred the CAS approach rather than directly with the university during this application process	Strongly disagree	1	2	3	4	5	Strongly agree
C16	My choice to submit the application via the CAS was a wise one	Strongly disagree	1	2	3	4	5	Strongly agree
C17	The CAS made the application process easy for me	Strongly disagree	1	2	3	4	5	Strongly agree
C18	I would recommend the CAS for all HEIs	Strongly disagree	1	2	3	4	5	Strongly agree

Section D: Central Application System (CAS).

In this section, the researcher would like to find out your opinion regarding the use of the Central Application System (CAS) for application processes.

Please tick the appropriate box with an X

D1	Would you say that the CAS is a preferred model for processing applications for HEIs?	
	Yes	
	No	

THE END

Thank you for your time and participation.

Appendix 8. Informed consent for survey



School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

Dear Respondent

I, Salamina Segole am a Master of Administration student in the School of Management, Information Technology and Governance, Discipline of Public Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled:

‘A Case of the Centralized Applications System: Staff and Student Perceptions at Durban University of Technology and University of KwaZulu-Natal’

The aim of this study is to:

- Identify factors facilitating and hindering effectiveness and efficiency in the application processes.
- To determine the perceptions of DUT and UKZN staff and students towards the CAS.
- Assess whether the CAS is a fit system for DUT and UKZN.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this research project. However, since you a student the University may benefit from the findings of this study.

Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, Information Technology and Governance, Discipline of Public Governance at UKZN. Your identity will not be revealed or your name used in connection with this study.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about twenty minutes to complete the survey questionnaire. I hope you will take the time to participate in the survey and then return the survey to the designated person in your unit.

Sincerely

Investigator's

Signature: _____

Date: _____

This page is to be retained by participant



School of Management, Information Technology and Governance

Master's in Public Administration

Researcher: Salamina Segole (074 408 5854)

Supervisor F.A.Ruffin (076 811 9595)

Research Office: MS P.Ximba (031 260 3587)

CONSENT

I, _____ (full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Signature of Participant

Date

Appendix 9. Alignment of research questions, objectives and interview questions

Alignment of Research Questions Objective and Interview Questions			
Key Research Questions	Research Objectives	Interview Questions	Focus Group Questions
1. What are the perceptions of staff and students about the use of the Central Application System in the application processes at the Durban University of Technology and University of KwaZulu-Natal?	To determine the perceptions of DUT and UKZN staff and students towards the CAS.	Thinking about how the CAS affects the running of your admissions office, what are your views on tasks performed by university staff members once applications are received by your university?	What is your opinion regarding the service provided for by the CAO to this University? Please explain
		Did you work at your university before the CAS was implemented? If so, please compare and contrast the decentralised and centralised systems – indicating your preference.	Were you working with admissions processes and procedures prior to introduction of the CAS? If so, kindly compare and contrast your experience with the former decentralised and current centralised applications process.
		Would you say that the centralization of all applications to the CAO the best way to deal with UKZN/DUT applications?	Is the CAO in your opinion benefiting the University with the application process? Please explain.
		Has the University considered the alternative method of processing applications?	Is the CAO in your opinion benefiting the University with the application process? Please explain

Alignment of Research Questions Objective and Interview Questions

Key Research Questions	Research Objectives	Interview Questions	Focus Group Questions
2. How can the Central Application System bring effectiveness and efficiency in the application processes for Durban University of Technology and University of KwaZulu-Natal?	Identify factors facilitating and hindering effectiveness and efficiency in the application processes at DUT and UKZN.	Does the CAO meet your timelines in terms by providing feedback to the University? Why or why not?	Would you say you are satisfied with the response time that the CAO provides your university?
		What do you view as the outcomes of the CAS? Please explain as to whether these outcomes are effective – why or why not?	What do you see as the outputs of the CAS? In other words, what does your university get out of the CAS?
		How can Internet technology improve the CAS?	To what extent does Internet technology lead to efficiency of the CAS in your view
		What are your views regarding the current admission process?	Explain your thoughts about the CAS (and the CAO) in terms of value for money – in other words what is the extent of efficiency in that regard?
		Do you still have students applying directly to the University? What are your views about that?	Please explain as to whether these outcomes are effective – why or why not?
		Explain your thoughts about the CAS (and the CAO) in terms of value for money – in other words what is the extent of efficiency in that regard?	

Alignment of Research Questions Objective and Interview Questions			
Key Research Questions	Research Objectives	Interview Questions	Focus Group Questions
3. Is the CAS model a fit system for DUT and UKZN?	Assess whether the CAS is a fit system for DUT and UKZN.	What in your opinion are the current challenges with admissions of undergraduate students at universities?	Is the CAO in your opinion benefiting the University with the application process? Please explain
		What factors facilitate implementation of the CAS?	Would you say you are satisfied with the response time that the CAO provides your university?
		What were the reasons that prompted the adoption of the Centralized Applications System?	How could services provided by the CAO to your university be improved?
		Do you think the CAS should be implemented throughout South Africa? Why or why not? Please explain	

Appendix 10. Alignment of research questions, objective and sub-headings

RESEARCH QUESTIONS	RESEARCH OBJECTIVES	SUB-HEADING/S
What are the perceptions of staff and students about the use of the Central Application System (CAS) in the application processes at the Durban University of Technology (DUT) and University of KwaZulu-Natal (UKZN)?	To determine the perceptions of DUT and UKZN staff and students towards the CAS.	Understanding the CAS The Role of the CAO in the CAS
How can the CAS bring efficiency and effectiveness in the application processes for HEIs in South Africa?	To identify factors facilitating and hindering efficiency and effectiveness in the application processes.	Efficiency and effectiveness of the CAS
Is the CAS model a fit system for DUT and UKZN?	To assess whether the CAS is a fit system for DUT and UKZN	Fitness of the CAS as an applications processing model
How can the CAS bring efficiency and effectiveness to the application processes for HEIs in South Africa?	Identifying the factors facilitate or hinder the efficiency and effectiveness of the application processes	

Appendix 11. Reduction of Interview transcripts

What in your opinion are the current challenges with admissions of undergraduate students at universities?		
Category	Responses	Coding
Application Process	Well the challenge is that many of the applicants don't meet <i>entry requirements</i> , DDR1	<ul style="list-style-type: none"> • Students not meeting Entry requirements DDR1 a. Large Number of applications to deal with DDR1, UPAAO b. School leaving results not a good indicator of success, DDR1 c. Unpredictable Applicant Behaviour DDR1 d. CAS Process Confusing to students UDSA e. Students not understand the application process. UDSA f. Inaccurate and missing information being captured and by the CAO. UPAAO, UDSA g. Outstanding Documents UDSA h. Employment of Temporary staff UDSA i. Transfer students UPAAO
Enrolment Targets	<p>we have like over 70000 applicants for 7500 spaces but nonetheless DUT has not met its target in certain years due to applicants not meeting entry requirements. DDR1</p> <p>The other challenge of course is that applicant behaviour is unpredictable, some applicants will indicate that they want to take up a space but they don't because they have gone elsewhere or they have chosen another programme DDR1</p> <p>so that is the challenge and of course eh an issue facing most institutions is that the school leaving certificate is not in good indicator eh of ability to succeed in studies. so the <i>NSC</i> does not determine whether at the end of the day you will have you're through... DDR1</p> <p>And we are dealing with a large number of students as well so that is eh some of the... the challenges that we... we have UPAAO</p>	
Applicant Behaviour	<p>The other challenge of course is that applicant behaviour is unpredictable, some applicants will indicate that they want to take up a space but they don't because they have gone elsewhere or they have chosen another programme DDR1</p> <p>People must still be <i>reminded</i> that at UKZN you don't apply directly to UKZN. People must still be reminded that at UKZN you don't apply directly to UKZN, you apply via the CAO. The first thing and it may be <i>confusing</i> to some people because they are not familiar with it. UDSA</p> <p>You... you... you have to work through CAO. UDSA</p>	

Data Capturing	<p>Okay at the moment what we really battle with is <i>accuracy of information</i> and eh completes information eh what we really depend on is the CAO information captured correctly. UPAAO</p> <p>...that really eh makes it a frustrating process for us because as we are dealing with this we are doing it within a timeframe that is short. UPAAO</p>	
Information	<p>often we come across <i>students that might have studied at another institution</i> but that information is not included in their application and that will make a difference in how we look at them so you know that sort of missing information is a problem or if there's any <i>incorrect information</i> whether it has to do with the result or their biographical information that really eh... UPAAO</p> <p>Number two; the challenge about <i>outstanding documents</i> or the quality of the data in terms of capturing and all these things. UDSA</p> <p>Eh if... if... if the information is <i>wrong or its incomplete</i>. Eh we still have to say CAO there is no ID number here... The address is <i>missing</i> and this and this and that you see, ja those are some of the things or the ID number has been <i>captured wrongly</i>. UDSA</p> <p>Jar so eh and then we...we...we... if there is a <i>document missing</i> that's their responsibility. UDSA</p>	
Staff	<p>So we don't have a problem there, we don't have to keep people that we do not want at some point. They have to <i>employ in temps</i> and this and that, we don't need that. UDSA</p>	
Managing Queues	<p>We have got thousands in one years we handed out 5000 enquiry forms to the students, 5000 students came and stood here or wanna be applicants. That didn't apply or hadn't heard...</p> <p>So it's how you manage them you know, what we would do is we would take groups of applicants out of the queue we have secured a lecture venue air-condition you know how it's like here in January.</p> <p>Air-condition, lecture venue, we would take them to the lecture venue and we would speak to them and we would give them this enquiry form and say our programmes are all full...DARI</p>	<p>Universities will always have long ques, it how they are managed that is important DARI</p>

How can these challenges be best addressed?		
Categories	Responses	Coding
Interventions	As an administrative person because that will be getting into the pedagogic issues but certainly there's a case eh in making sure that there's the gap between school leaving and the requirements of higher education are bridged and... and I am aware of many interventions that take place like student tutor programmes... DDR1 There's eh monitoring of performance, there's counselling of students. DDR1	<ul style="list-style-type: none"> a. Communication between the CAO and Institutions UPAAO b. KZN being a rural area DAR1 c. Diversity among HEIs UDSA d. Post Office influencing the turnaround time DAR1 e. CAO as an advantage to many institutions UDSA f. Preference of paper based application than online application DAR1 g. Compatibility of IT Systems UDSA h. Slow turnaround time DAR1
Communication	Eh we do communicate that and as far as I understand there was a coordinated either report of feedback given from the university especially about the accuracy of information. UPAAO	
CAS	CAO... the idea of CAO is good. In my view, the basic idea behind it has been an <i>advantage to many institutions</i> and that's why the minister is going that route. UDSA	
South African Landscape	Where eh the applicants and <i>KZN is very rural</i> eh it's a very rural eh part of South Africa. DAR1	
Other Countries	And that is what is happening in other countries as well. ...and the UK. If you look at UK and their system as well. UDSA	
Different Institutions	But you need to have a <i>common understanding</i> ... Of what is intended to be achieved and there is also a need for flexibility you know <i>institutions are not the same</i> . Eh if you have any extra additional things for your institutions provision must be made for it. UDSA	
Application Types	And so there is not a lot of <i>technology</i> out there so there is a lot of <i>paper application</i> eh so the turnaround time is very slow because we depend a lot on the <i>post office</i> . And when you recall the post office was on strike last I think it was for almost a year. DAR1	
IT Systems	And three the system... the system that you use... It must be up to standard and it must <i>compatible</i> to your own internal system. Remember CAO uses their own system? UDSA When the information comes to us it... it... it must talk to our... UDSA And so there is not a lot of technology out there so there is a lot of paper application eh so the <i>turnaround time is very slow</i> because we depend a lot on the post office. DAR1	

And how has this decision impacted on the University's admission processes?		
Categories	Responses	Sub Categories
Application Process	Yes, it has because we don't have to handle applications ourselves that's one and eh two the applicant that serves apply to more than one programme... DDR1	
Matric Results	Well the first one is your requirements obviously it needs to be something that needs to be done at school level or obviously needs to be improved but you can generalize especially with the NSC not being a good indicator. DDR1 As an administrative person because that will be getting into the logic issues but certainly there's a case eh in making sure that there's the gap between school leaving and the requirements of higher education are bridged and... and I am aware of many interventions that take place like student tutor programmes... DDR1	School leaving results are not a goon indicator that the student will succeed DDR1 Not enough interventions done to close the gap between the school leaving results and the requirements DDR1
CAS	I think yes I... I...I do think so, there was a few <i>teething problems</i> that have been resolved and along the way there are difficulties you know with the system. UPAAO I think it's... it's... personally I like the system I find it <i>easy to use</i> and it's useful eh that we can see what else the student is applying for. UPAAO So the bulk of the first year which is directly from Matric in South Africa are handled via CAO... UDSA we can actually see and <i>tract their results online</i> so it's been quite a positive development in terms of <i>monitoring the status</i> the status of the applications and if they are being rejected by the institution so we will be able to tract that so it does give you an indication of where the applicant wants to go as well. DDR1 Remember CAO is only doing applications. Now in January during that busy time, we handle those things ourselves. UDSA	<ul style="list-style-type: none"> • CAS provides the ability for institutions to view all the applications that the student has applied for UPAAO • The CAS system is easy to use UPAAO • Allows for tracking of the student's result and monitoring application status DDR1 • Reduced number of staff in the admissions offices and staff was put to better use DAR1, UDSA • Experienced difficulties to be resolved UPAAO
Staff	The <i>number of people employed</i> in the enquiries office are fewer than it would have been in that case. UDSA	

	<p>And then we found that eh where we were sitting with 15 people that were sitting in admissions office because of all the data that they had to be captured. DAR1</p> <p>We were able to put them into <i>better use</i> eh when I say better use I mean in terms of assisting academic departments with their selection decisions whereas in the past we were mainly... the student admissions office was mainly a post office, just passing the information as quickly as they could. DAR1</p> <p>With the CAO we saw the possibility of <i>utilising the staff better</i> well the CAO now becomes our post office. DAR1</p> <p>Yes, so we were able to <i>reduce the number of staff down</i> to 6. One per faculty...</p> <p>Whereas back then the initial stages before the CAO we were sitting between 15 and 20 staff members. During our peak periods. DAR1</p>	
<p>Selection Procedures</p>	<p>They <i>don't make selection decisions</i> for us and so really they are... they are mainly a clearing house for the universities if you wanna call it that. DAR1</p> <p>When they capture that information they make it easy for us where they will capture eh they will be different <i>colour coding</i> against the student which means the student meets the entry requirements, doesn't meet the entry requirements... DAR1</p> <p>Or partially meets the entry requirements so it made it a lot <i>easier for us to make box selections</i>, if it was blue for example the student met the requirements if it was red they didn't meet the requirements. DAR1</p> <p>Eh when we are selecting students we wanna put in a whole lot of information to extract the whole group that we are needing so sometimes it's <i>limited in parameters</i> that we can use to choose students so for example if I am looking for a group of students, I might want to specify <i>what sort of maths</i> result I am looking for. UPAAO</p> <p>We have <i>matric types</i> we can specify, we have got points but we don't have further details like in terms of the subjects that they do and their results in that and that's <i>related to our criteria</i>. UPAAO</p> <p>It would make it easier for us if we can match it for <i>our criteria</i> then I can know this is the group that I am working with and they are very likely to meet our criteria so in terms of eh that. I think it's... UPAAO</p>	<ul style="list-style-type: none"> • Colour coding for make it easy to do selection DAR1 • Institution specific criteria and limitations during the selection process UPAAO
<p>Entry Requirements</p>	<p>So while we looked at that we didn't just trust that everything was a 100% we give them <i>our entry requirements</i> so they capture them in the system so what we give them is what they have got but there could be errors. DAR1</p> <p>We could have eh <i>dropped our entry requirements</i> or up our entry requirement so we don't just decide that because it is red it's that they don't meet, we actually check it and our admissions office can do that now because they don't have to capture all that data anymore. DAR1</p>	<p>Updating of Entry requirements done my CAO DAR1</p>

Information	<p>...we could confirm that the <i>information was correct...And accurate</i> we were more comfortable registering our students without the <i>long queues</i> and all the paper DARI</p> <p>Where <i>they capture all the information</i>, they <i>follow up</i> on all the <i>missing</i> information, they make it easy for us where they will capture eh they will be different colour coding against the student which means the student meets the entry requirements, doesn't meet the entry requirements.... DARI</p>	<ul style="list-style-type: none"> • Confirmation of authenticity of results DARI • Follow up with students is done via the CAO DARI
Results Verification	<p>Where there was a lot of <i>fraud</i>...And... and eh <i>misrepresentation of qualifications</i> and we basically used to have to take to at first value once we got that system up and running where we brought into the CAO and we could confirm that the information was correct...DARI</p> <p>They <i>verify</i> eh the eh qualifications of the students in other words when I say verify eh they actually get alerts in the system to warn us if there are any irregularities. DARI</p>	
To what extent are these problems/challenges addressed through the centralization process? Please explain?		
Categories	Responses	Sub-Categories
Student Recruitment and Marketing	<p>... and also we find that the CAO got a lot of career fares, now they don't represent eh institution as such. We don't want them to favour an institution, we want them to go there with general knowledge about all of our institutions which they do. DARI</p> <p>They are able to go and give the schools information, we find that a lot of information you get head... head... head or principals of schools who just out the <i>information in a box and they never distribute it</i> to the applicant so we lose that personal touch with the students or the applicants as such. DARI</p> <p>So we have got our own eh recruitment section <i>here as well</i>. DARI</p> <p>Eh we also find that a lot of... a lot of communication is done through the schools because it is so rural DARI</p> <p>And then in terms of marketing it is a <i>joint approach</i>. UDSA</p> <p>There is a CAO booklet which comprises information from eh all the affiliates. so you... so you... you share the <i>share the cost</i> of marketing. UDSA</p> <p>Yes, they generate it and then they can go, we... we can now do <i>focused marketing, targeted marketing</i>...They go all over because the primary target area is KZN. UDSA</p> <p>Now if we are interested in specific schools in addition to what they would have done, career exhibitions then we can focus on specific areas and schools.</p> <p>That's the advantage we don't have to go all over. UDSA</p> <p>Jar because all the information about all the institution will be there. UDSA</p>	<ul style="list-style-type: none"> • Institutional representation at Career Fares that CAO DARI, USDA, DDR1 • School Principal not distributing the Information to applicants DARI • Marketing and student recruitment is a joint cost saving approach DARI, USDA • CAO handbook UDSA

<p>Advantages of CAS</p>	<p>That's it's been a good eh vehicle for us because we don't have to... to do that ourselves so the students apply to them and we can <i>view the applications online, we can make selections online, we can communicate</i> with the students online and eh so it's been useful eh from that point of view. DDR1 And eh the <i>burden of setting up an office</i> to deal with the administrations has been offset by the central applications by dealing with it DDR1 Now we are <i>not sitting somewhere with the documents</i>, they have them there. All these things that we need on the system so we don't have files that we don't need, that's the advantage. UDSA In addition to initial intention eh to assist students and to make it <i>accessible and affordable</i>. The following are advantages: these students will be on the system right... UDSA If they are not accepted by one institution the other institution can say... because the <i>admission requirements</i> are not the same... Yes, they are already in the system. UDSA There is a <i>CAO booklet</i> which comprises information from eh all the affiliates. so you... so you... you share the share the cost of marketing? UDSA They go all over because the primary target area is KZN. Now if we are interested in specific schools in addition to what they would have done, career exhibitions then we can focus on specific areas and schools. That's the advantage we don't have to go all over. UDSA ... another stupid saving is that we save on the printing. UDSA So that's the other advantage and that we don't have to deal with the masses. UDSA The CAO eh as soon as we change the status that generates an sms to the student. So the student then knows immediately if he has been <i>accepted yes, rejected or</i> he has been given a firm offer. DAR1 Well they are quite with the <i>communication</i>. They are. They are very good they are. DAR1</p>	<p>i. CAS allows for online processes, such as selection, checking and tracking applications online to take place DDR1, UDSA, UPAAO, DAR1</p> <ul style="list-style-type: none"> • CAS takes the burden of setting up applications office DDR1 • Documents are stored online, no physical documents on sight UDSA • Affordability and Accessibility UDSA • Students not meeting the admission Requirement can be accepted by other universities UDSA • Saving on printing costs UDSA • Institution to deal with crowds or masses of students UDSA • CAO offers Effective communication to students on the status of their application DAR1
<p>in the System/ Fears regarding the CAS</p>	<p>So there <i>are a lot of in the system</i> that need to be corrected and I fear that with the new <i>central applications service</i> it's going to be too big and too impersonal, it's to going to... if they are doing it the way that they</p>	<p>Addressing the with the CAS approach DAR1</p>

	<p>want to do it I feel that eh I don't know, I just don't know that they are going to have <i>the man power</i> that they are to give it the full attention that it needs and the eh the information... DAR1</p> <p>You can imagine the <i>size of the information</i> eh what size that is going to be and <i>our kids in KZN that battle already</i> with the little book that we have, they battle already with that I dread to think when the book is national. DAR1</p> <p>I can foresee <i>problem eh but NSFAS</i> is a big challenge and if we are going to suddenly go live with NSFAS and go live with CAS I think it's gonna be a train smash and quite honestly I have tried to get the KZN institutions to get together and to come up with a strategy to say 'Don't touch us' DAR1</p> <p>'<i>Leave us alone</i>' 'introduce CAS for anybody else that you want to, leave us alone and do your trials, do your pilots, do whatever you want to do and when you have sorted it out come and fetch us' DAR1</p> <p>'But don't <i>interfere with us, our system</i> is working perfectly' And I really mean it is working perfectly we couldn't ask for a better system eh for a better application system.</p> <p>DAR1</p> <p>Like I can see lot of institutions with CAS they are very <i>reluctant</i>. DAR1</p> <p>And eh period of which <i>CAO itself</i> may be concerned about this development they don't know where it is going to leave them. UDSA</p> <p>Period whereby people might be <i>sceptical about both</i>. the scepticism. Yes, the big thing that people are asking 'who is going to be <i>funding</i> this thing. UDSA</p>	<p>Implications for NSFAS applications DAR1</p> <p>Interference with Institutional processes DAR1</p> <p>Reluctance from Institutions with regards to moving to the National CAO UDSA</p> <p>Concern about the CAO organization UDSA</p> <p>Funding for the CAS UDSA</p>
Applicant Behaviour	<p>So eh you know so... so we are trying to make the <i>applicants responsible</i> as well. They must be responsible they are young adults now... DAR1</p> <p>We want them to be responsible as well but it doesn't help us with our enrolment targets if we don't know who is coming. So we give them <i>3 weeks to accept an offer</i> and pay the deposit and if we haven't heard from them in 3 weeks we withdraw the offer and we will give it to someone else. But you will find that they will come here in January... DAR1</p>	<p>Universities charge an acceptance offer fee to meet their enrolment target which must be paid, within a certain time period DAR1</p>
Online Application Service	<p>That's it's been a good eh vehicle for us because we don't have to... to do that ourselves so the <i>students apply to them</i> and we can view the <i>applications online</i>, we can make <i>selections online</i>, we can <i>communicate with the students online</i> and eh so it's been useful eh from that point of view. DDR1</p> <p>Remember there won't be... <i>most of them are online</i> we don't get any papers from CAO. UDSA</p> <p>R: We get them online right and we get the forms later once the student has been accepted so it saves us pile and piles of papers that we don't need. UDSA</p> <p>So that they could make <i>application on line</i> and we could communicate with them online. DAR1</p> <p>Eh generally we... the applications go out, the application come in they get <i>captured we go online</i> we do what we need to do with them, we make our decisions there is the... DAR1</p>	<p>Convenience of online application process DDR1, UDSA, DAR1</p>

Data Capturing Errors	<p>We clean up all the <i>errors with data</i> and we do find things that are not right whether the initial does not match with the person's name. UPAAO</p> <p>You know a whole lot of minor things like that or simple <i>biographical information</i> I should say. UPAAO</p> <p>That's not <i>accurately captured</i> so that's you know most common UPAAO</p>	<p>Data Capturing errors inaccurate and mission information UPAAO, DARI, UDSA</p>
Communication	<p>Eh we also find that a lot of... a <i>lot of communication is done through the schools</i> because it is so rural DARI</p> <p>So a lot of them don't get the information because again it's because of the paper information because there is no communication where we are able to communication with the student directly, it's all based on paper. DARI</p> <p>The challenge may be an applicant may not know at which point must we stop talking to CAO ...and at which point must we talk to them, that communication channel must be made very clear. UDSA</p> <p>We may know what we want but eh not everybody what it is that is intended to be achieved here so those communication lines must be clearly outlines. UDSA</p>	<p>Outlining of Communication with students and using school to send communication to students DARI, UDSA</p>
Multiple IT Systems	<p>They are <i>completely different systems</i>, there is <i>no link</i> so in other words when you say you want eh NESFAS there is no link in the system to take you to NESFAS where the two can merge the two together DARI</p> <p>We use CAO up until the end of December, in January then we only use our ITS system so that is the peak period. UPAAO</p> <p>Eh so you know I am not sure how CAO is doing from the systems point of view in that time but I think that may have been one of the reasons that lead to us using <i>a separate system in January</i>. UPAAO</p>	<p>Using separate systems DARI, UDSA, UPAAO</p>
Resolution of Problems	<p>Eh again as I said those people that are sitting on those panels they have got eh they have got eh working group. It's one thing to have registers as a working group but when you have their hands on people involved then it's totally different environment and so I can see a lot of areas where I can... I can foresee problem DARI</p>	<p>Establishing a working group to resolve problems DARI</p>
Different types of Institution/ Diverse Institutions	<p>They can't understand it <i>because they are coming from places like UCT and eh... eh NMNU</i> eh you know those well I mean I don't wanna call them advantaged universities because but they... they certainly don't have the same problems that we are in KZN have for example so to get those universities to understand how many people we are going to be leaving, we are going to be missing out on if we don't get this technology sorted out first. DARI</p>	<p>Some Universities are advantaged and don't have the same problems DARI</p>
Accessibility and Affordability <ul style="list-style-type: none"> • Access to technology at schools 	<p>Eh we also find that a lot of... a lot of communication is done through the schools because it is so rural. DARI</p> <p>I think... I think the <i>application fee</i> is not expensive. I think we charge R175 and they can out 6 choices. DARI</p>	<p>Determining Fee payments and dependency of Financial aid DARI</p>

<ul style="list-style-type: none"> • Financial affordability 	<p>But I am saying that it's not expensive because I am earning a salary every month I am not living with my grandmother because my parents have passed away and my grandmother is on a government grant or on R300 a month. DAR1</p> <p>Not understanding the people because most of our people in <i>fact 80% of our applicants are dependent on financial aid</i>. 80% of them so now we were talking about the application fee and now we are talking about eh a deposit to secure your place. DAR1</p> <p>So when we send a student an <i>acceptance package</i> it lie at the school until the matric results are published in January. DAR1</p> <p>By which time it's almost a case of we have had to move on and given a <i>chance to other students</i>. They will still come in January. DAR1</p> <p>At school level where even if we needed sponsors to come in sponsor computers and sponsor eh like Vodacom and MTN you know sponsor the eh... eh... eh... eh... eh what do you call those USB 3G... DAR1</p> <p>And when I told them that two thirds of the applications in KZN are paper eh two thirds of our applications are paper. DAR1</p>	<p>Students don't receive the acceptance packages and having their offers withdrawn DAR1</p> <p>Consideration to provide Internet accessibility to applicants DAR1</p>
What Factors facilitate the implementation of the CAS?		
Categories	Responses	Sub-categories
<p>Towards the implementation of CAS</p>	<p>R:I think... I think for me they should start off small. DAR1</p> <p>They shouldn't go big bang I know they want to please the minister eh you are never going to stop walk ins and... and the whole reason for this CAS was because of that stampede. DAR1</p> <p>Mhm you know eh at provincial level its small. UDSA</p> <p>R:Its manageable you can have <i>a steering committee</i> that can easily meet it in a <i>small geographic area</i> that cannot be a factor there may be a number of commonalities... UDSA</p> <p>Jar so that's the... now if it's regional you will limit the effect of a possible problem. UDSA</p> <p>Jar so eh anything national has got its own complexities and challenges and it must be grouped. UDSA</p>	<p>CAS has to be provincially or regionally based to minimise complexities DAR1, UDSA,</p> <p>Establishment of a regional steering/working group committee to address problems DAR1, UDSA</p>
<p>Public Engagement and Awareness</p>	<p>So a <i>lot of awareness needs</i> to be created with that and maybe working with schools and... and on the <i>media</i> as well. UPAAO</p> <p><i>If I need to apply at the university and CAO</i> so I think it is something that need to be understood with the members of the public. UPAAO</p> <p>Because <i>clearly people don't know about that you know</i> as we are interacting with them so we go to them and explain that you will <i>need to apply through CAO</i> and this is how you go about doing it. UPAAO</p> <p>And then the logistics around it must be eh... eh... eh agreed to, if this happens then this happens. UDSA</p>	<p>Application processes must be clear outlined to the general public UPAAO, UDSA</p>

<p>Diversity within the Universities</p>	<p>And each institution has probably has got its own way of doing things. UPAAO Once you go national number one you are now serving diverse groups...of <i>established institutions</i>...Who are good in their own rights so there is a possibility of resistance...UDSA ...and they are using a different software...Different universities may be using... Different software's... UDSA And the application fee although there are some issues about the application fee, some universities don't want to charge an application fee. Others do, others are flexible around it. UDSA</p>	<p>Addressing Differences among universities including the use of different IT systems UPAAO, UDSA Determine Fees to be paid UDSA</p>
<p>Learning points from the CAO</p>	<p>Well I think personally if the authority or whoever is responsible for implementing the CAS have to look at the CAO for... for advice and just research into some of the challenges and the difficulties and the positives t it would make the implementation of the CAS hat much easier because I am sure that many of the... the issues would be quite similar to the implementation of the national Central Application System. DDR1</p>	<p>CAO as blue print for seamless implementation of the CAS DDR1</p>
	<p>...the IT system eh all of those I think the CAO would be a good example to look at when implementing the CAS. DDR1 I think what's very important is eh one of the areas is the systems because often there are huge plans made. UPAAO Jar the IT systems but the IT systems can't deliver so they need to be checked that they can cope with the increased number of applications, with the increased number of uses. UPAAO If... if that... because that's our... our very big frustration when the systems can't work with you... UPAAO That's the first thing, the second thing is should your systems fail...your IT systems fail...And they can fail. UDSA And let me not go to the extreme example factor, should there be delays or challenges then the whole countries are affected. We did have something like that at... at CAO 2008. UDSA So if there are such challenges and even the worst if it fails, if it crashes... the impact...Jar then the information and the impact will be drastic to contemplate too drastic so it...it is just one of those so our IT systems must be up to date. UDSA IT systems which is smart. Smart in a sense that now it must compatible with the systems of different universities. UDSA You could be on ITS you could be on People soft but when the information goes to those things it must be compatible so that's the one challenge that they must see. Yes, and they are using a different software... UDSA</p>	<p>Investment on good, smart, IT system that will not fail DDR1, DARI, UPAAO, UDSA</p>

Did you work at your university before the CAS was implemented?			
DDR1	Yes, I started at this institution at the registers office in 1998. The CAO was implemented somewhat in 2000, 2001... So there were a few years where actually I was actively involved... DDR1		
DAR1			
UPAAO	<i>(Talking while laughing)</i> that's a very long time ago. I: (Laughs) I understand. Roehl you know I think I am trying to recall what we used. UPAAO Yes, because I think we have been with CAO for years I can't even remember... 2000 okay it's been 15 years already. UDSA		
UDSA	I have been eh associated with both.		
Please compare and contrast the decentralised and centralised systems – indicating your preference.			
Respondent	Centralised	Decentralised	Emerging Themes
DDR1	I think that the <i>system is far better</i> DDR1	In application without the CAO in which we dealt with it, we certainly while you have more control over your applications but it's not necessarily a positive thing DDR1 So an applicant can still place an application with you but go to UKZN or go to any other institution. DDR1 Ja. So I am not sure that there were any real advantages of doing it or going it alone eh ja I think that the system is far better DDR1	The decentralised way was not necessarily positive, even though Universities had control over their application DDR1 With the decentralised model, you can never know if the student is going to take your admission offer or go to a different University DDR1 CAS is a far better system DDR1
DAR1	It is because they haven't taken any control away from us. They are just the middle... the middle man working for the institutions. DAR1 We don't pay anything to belong to them. DAR1 No., no they are very good. DAR1 (People talking in the background)	So you will never go the decentralised route? No DAR1	CAO has not taken control form the Universities DAR1 Institutions don't pay anything to belong to the CAO and they are very good DDR1

			DUT will not consider the decentralised model DAR1
UPAAO	Russo CAO is definitely advanced in that regard with using IT to improve on how we look at things. UPAAO I: Did it bring about efficiency? R: Yes, definitely, definitely. UPAAO	I know prior to this there were, there was like a banner system that was used and then you would have manual forms that are coming to you. UPAAO	The previous banner system had manual operations UPAAO CAO had advanced the operations using IT to bring efficiency UPAAO
UDSA	Neutral Comments: For me <i>it is what works</i> . Jar if it... the aim of the whole thing is for it to work. Eh I am easy with both as long as they work, the aim is to make it happen for... it's about the quality of service delivery. UDSA I: And you can get both, you can get quality in both types of systems? R: Yes, yes, yes. UDSA (<i>Cutting in</i>) you can... you can have decentralising which is not working. which is not working... UDSA And you can have a central system which is very efficient. UDSA		A model has to work, it can either be central or decentralised as long as it bring about quality of service deliver UDSA
Would you say that the centralization of all applications to the CAO the best way to deal with UKZN/DUT applications?			
Categories	Responses		Emerging Themes
Perceptions about CAS	But for your DUT environment you... you quite happy with the CAO? Yes. DDR1 It works well, it works very well. DAR1 Eh I think so; I don't see any problems with it. UPAAO CAO... the idea of CAO is good. In my view, the basic idea behind it has been an advantage to many institutions and that's why the minister is going that route. UDSA But we are <i>losing income</i> at the same time. Remember we could be getting that money directly from the applicants. UDSA That currently goes to CAO Eh we don't get it, can you imagine that 80000 something that applied times eh the applicant fee. That's a fortune of millions that we could be getting, we are not getting that, that's fine. UDSA		General satisfaction towards the CAS, DDR1 , DAR1 , UPAAO , UDSA <i>with comments</i> Feeling that the universities could make money from the income generated by application fee payment, UDSA
CAS Outputs	They can give <i>us reports</i> I mean we can draw reports that you wouldn't believe from the CAO the... the data that they capture. They store for us... DAR1 Our criteria are made very clear in <i>their handbook</i> eh or it's available online. UPAAO		CAO provides statistical reports for management information, DAR1 ,

Has the University considered the alternative method of processing applications?		
Categories	Responses	Emerging Themes
Perceptions about CAS	<p>It's not as if one, one would just simply say 'let's try something else' you are part of a system which we all participated in and you make the best of it. We were... we were outside the CAO prior to the CAO so I suppose the... the out results is that we have seen the benefits of the CAO and it will be quite <i>foolish to leave something that is working</i> quite well. DDR1</p> <p>No what we are doing now is we are working <i>on a real time eh system with CAO so in other words what...</i> when we register our student that information will feed. DAR1</p> <p>Eh no I think <i>I personally like the CAO system meaning</i> on what I can compare it to we use our ITS system in January. UPAAO</p> <p>Look let me be eh... eh... eh upfront about this one...<i>Not everybody</i> in the <i>university is for the idea it's just</i> that it's there and you can't change it. There's a <i>contract that is</i> the first thing. Second not happy... <i>not everybody is happy with the quality of service for right reasons or</i> wrong reasons. <i>But on the whole eh I think the arrangement makes sense.</i> UDSA</p>	
Do you still have students applying directly to the University? What are your views about that? (the fact that students apply directly?)		
Categories	Responses	Emerging Themes
Walk-ins	<p>Jar. UDSA</p> <p>Well if there are we refer to the CAO. So we don't entertain applications here. And if a person comes in at the beginning of the year without having to apply with the CAO we <i>don't register them. We... we... we... we either send them to the CAO</i> to put that application in or we record their details and if there is a space available we contact them. DDR1</p> <p>If they do, we get a lot of correspondence coming in here still. We will <i>send it to the CAO.</i> DAR1</p> <p>We have them all the time. Throughout the year coming into our offices saying they want to apply eh and some even request that they wanna apply directly to UKZN. I think <i>they feel that would be a better</i> thing to do but we have got them all the time steaming in here and even though we have got an applications office they come here to our office as well. UPAAO</p> <p>Yes, and when we still had, we are no longer going to have it. When we still had walk ins... UDSA</p> <p>When we had it until the beginning of this year we had walk ins we had what we call 'clearing houses' So walk ins will not be floating all over the place... UDSA</p>	Late applications are recorded and referred to CAO DDR1, DAR1

What do you think about the tasks performed by the CAO toward implementation of the CAS?		
Categories	Responses	
CAS inputs	<p>That's how applications are dealt with, how they are captured, how they are placed online, eh the re contacting of eh... of applicants, the sending of sms and all the business processes that can be learnt from the new CAS. DDR1</p> <p>It should be very similar; it should be very similar. It's been here for 20 years and its working why go and re-invent the wheel and if you think there is room for improvement but I wouldn't go and re-invent the wheel. DARI</p> <p>That kind of question will be relevant to... UDSA (Note Question for CAO)</p>	<p>CAS manages the entire application process of undergraduate student, from capturing the application, sending information to students. DDR1</p>
Thinking about how the CAS affects the running of your admissions office, what are your views on tasks performed by university staff members once applications are received by your university?		
Categories	Responses	
Internal Factors hindering efficiency	<p>Well I think the main thing from <i>academic staff being involved</i> is to make selections on time and if you do this early enough then applicants won't leave their application till the last eh month. DDR1</p> <p>So they start giving you conditional offers etc. eh much earlier in the year so it's up to individual departments to... to make those kind of decisions and to also particularly to analyse the pool of applicants so that they are getting the e best possible students as well. DDR1</p> <p>Jar the main is to capture <i>the selections decisions</i>. And to capture them as early as possible, the problem is that all departments want the best students. DARI</p> <p>So we need to <i>speed up our selection decisions</i> and capture them on the CAO which we are doing eh I was acting in admissions. DARI</p> <p>The same staff that are dealing with <i>admissions have a number</i> of other responsibilities that they are involved in...UPAAO</p> <p>And in... in our office here we have also had eh staff cut backs, we have lost staff so they have taken a greater load and students eh the only thing is that eh they do the admissions then they are involved in registration then they are involved in graduation preparation eh they are dealing with current students and all the enquiries and request so its juggling all of those eh tasks. UPAAO</p> <p>Jar they are very effective eh it's how the university utilised them that makes them or that could make it better or effective. DARI</p>	<p>Selection processes are slow DDR1, DARI</p> <p>Staff at the admission office can be put to better use, UPAAO, DARI</p>

Late Applications	<p>Now there is no reason for that because the eh if a student application comes after the 30th of September I think what you need to understand is that as human beings a lot of <i>people wait till the last minute</i> so the bulk of the applications come in the 30th of September. DAR1</p> <p>CAO has go to capture thousands and thousands that have come in at the last minute. DAR1</p> <p>It's not fair just because somebody stands in front of you to give an offer other than the guys that have been waiting. DAR1</p>	Students wait for the last minute to apply DAR1
What do you see as the outputs of the CAS? In other words, what does your university get out of the CAS?		
Categories	Responses	
Resources	Jar, well of course to... to... to deal with eh we receive 75000 applicants thus far let's assume that we had to continue to get those number of applications eh it would take quite a <i>massive infrastructure</i> to... to... to deal with which would be costly for the institution in terms of staff DDR1	Human and Infrastructure DDR1
Benefit For students	<p>Students pay a single application fee DAR1</p> <p>There is another issue about the rural schools which eh I know that there are many initiatives by the CAO to use certain schools to assist applicants to fill in their application and then receive them at a later date so they are some; I am not sure about that so you might have to interview the CAO executive director. DDR1</p>	Single Application Fee payment DDR1
Benefits for the University	<p>there is that as well and they also do a lot of marketing indirectly although they don't represent an institution, they go into the areas that we can't get into...DAR1</p> <p>...can get and all those reports that we can get. We can see which is our top 10 feeder schools on KZN we can decide whether the top 10 feeding schools are our... how many students did we register from the top 10 feeder schools and we... what we are finding is that although they are our top 10 feeder schools they are not the best students. DAR1</p> <p>These are the schools that we are getting more students from those are not the schools that they are getting students from so we... we can... we can see if the CAO visiting the rural areas that nobody can get to, are we... we wanna make sure that we are not neglecting the rural areas and so that information is available to us. DAR1</p> <p>Exactly yes you can, you can and you can plan and... and... and... and recruit and get a meaningful information from what the CAO does. DAR1</p> <p>And the <i>matric results have already been verified and downloaded</i> straight from the DOE into the CAO system for us (<i>People talking in the background</i>) and they put as I said they put alerts if there is anything wrong. DAR1</p>	

	Eh and those are some of the things that are at the top of my head that they I can think of you know that eh that eh that they are able to give to us with a press of a button. (Laughs) DARI Eh I think they are removing this whole function of having to capture the applications. UPAAO	
What do you view as the outcomes of the CAS? Please explain as to whether these outcomes are effective – why or why not?		
Categories	Responses	
Matric Results	when the results are <i>released they don't</i> come directly to us, they go to CAO where the matching will be done and we get them. UPAAO	
Effective communication	You know for <i>example sms going out</i> to them in real time a firm order and requisition for ordering and all of that it is sent out via sms, email, letters are generated in the system so in terms of communication with the students it's actually very quick. DDR1 For example, if you are regretted for one programme you can change applicants can change. They can change and apply somewhere else. they know how to... to... to react to the news? DDR1	
Accessibility	That is different with CAO is that an applicant themselves can go and look at the application. Whereas if we were to stick into using <i>our ITS system there</i> currently isn't an option like that, that I am aware of... UPAAO There are also <i>CAO fares</i> that are held where the student fill in the forms hard copies get taken back eh to the office so those... there are various initiatives to deal with so it's not the only way of students making applications although it's the desired way so students do to the CAO offices and make application then pay and all of those things that happen. DDR1 They set up papers all over at Pick n Pay, Spa, and Checkers all over the country so that they can go and pay so they don't put money in the post now they don't want cash, they don't take cash. DARI	
Single Application Fee	And then the benefit to the... to the community not just to the students but to their parents as well, I mean you pay <i>one application fee</i> for applying to many programmes DDR1	
IT Systems (Proper/Adequate/Efficient)	<i>And systems in place</i> so that would be a major challenge for... for... for the university to have a system in place to deal with it in a way that its currently being dealt with. DDR1	
Burden of Capturing	So they... they are involved in a lot of capturing. DDR1 Eh I think they are removing this whole function of having to capture the applications. UPAAO	

Effectiveness of the CAS	I: Okay are they effective, the CAO? R: Eh I think so, I would say they are.	
Interaction between Universities and the CAO	We find you know it's quite easy to interact with them and eh they respond quite quickly as well. UPAAO And where there are challenges we are open about them and they... they... they are referred to CAO and some of them or most of them have been addressed. UDSA The CAO that makes it decisions through a user group (<i>Clears throat</i>) a steering committee as well as the board of directors of which the university is a part of so there's a consensus and all of those things and that are mutually agreed upon. DDR1	
Please describe how the CAS works in terms of timeliness		
Categories	Responses	
Timelines	Yes, definitely they meet our deadlines and they go that extra mile to make sure that they meet our deadlines. DARI They do. UPAAO Oh I think there is eh I think they do get flooded with applications and maybe takes them longer to process that. UPAAO Yes. UDSA	CAO meets the timelines DARI, UPAAO, UDSA
Explain your thoughts about the CAS (and the CAO) in terms of value for money		
Categories	Responses	
Resources and cost saving	Jar, well of course to... to... to deal with eh we receive 75000 applicants thus far let's assume that we had to continue to get those number of applications eh it would take quite a massive infrastructure to... to... to deal with which would be costly for the institution in terms of staff DDR1 Eh I talked about marketing as well. UDSA	
What is the role of Internet technology in the CAS? To what extent does Internet technology lead to efficiency of the CAS in your view?		
Categories	Responses	
Lack of Technology	So they ask them to go and pay at Pick and Pay, Checkers and where ever so that are partners working but... but there are still long timelines delays where paper work is sometimes eh it's probably being lifted at the post office but never gets back to us. Or back to the CAO so there I still too much paper. DARI Yes, I think they could maybe do a little bit of research on how best they could help with the technology when they go to schools for example. They could go with a whole lot of laptops and a	Provide 3 G to schools for internet Access at schools, particularly in Rural KZN, DARI, UPAAO Most applications are still manual UDSA

	<p>whole lot of 3G cards. And let the applicants apply straight away online and help them to apply. DARI</p> <p>Jar eh we have a diverse market and in... in... in KZN there is <i>specific focus on rural areas we mustn't forget that so now with our experience there hasn't been any concrete</i> time on... on...on the extent to which people are exposed to technology but the overwhelming majority of our applicants still do it the old way which is paper based. UDSA</p> <p>Most of them like to complete the actual form and submit it to CAO. Not high up because a lot... eh what we see is that a lot of students don't have access to it. UPAAO</p> <p>I think that would even go beyond us here because it means whether they have <i>computers and internet access is at school</i> and libraries and community centres and things and that's how CAO would be reaching them and make it available. UPAAO</p> <p>Until you know thing improve in the country in terms of infrastructure and all of that eh to allow people eh if they have <i>access to apply online</i> or if not have the applications handed in. UPAAO</p> <p>Eh although... although CAO has made provision for both paper based and online applicant we are told about two thirds still apply manually. UDSA</p> <p>That's the one thing for the applicant, in terms of us and CAO. Technology has been very, very helpful...UDSA</p>	
Briefly outline your responsibilities with regards to the South African educational policy implementation at your University?		
Category	Responses	Subcategories
Policy Compliance	In terms of policy development, I suppose I will responsible for operational plans relating to my full responsibility and if I was able to develop related to those I would and I have contributed to policy that have been administered elsewhere for example admission policy like which policy etc. and I have contributed to policy that have been administered elsewhere for example admission policy, language policy like which policy etc. DDRI	
Operational Plan	In terms of policy development I suppose I will responsible for operational plans relating to my area of responsibility and if I was able to develop related to those I would DDR1	
Policy Updates	And often I find that I need to update where I find that things are outdated and eh that things could work better if we did them differently. DARI	

Appendix 12. Reduction of Group interview transcript

Admission Challenges CAO perspective		
Category	Responses	Reduction of responses
Late Admission Decisions	<p>You know we get students that apply early in the cycle; Okay now, the problem is that if you apply early applicants wanna know, they wanna make arrangements...And there are very few faculties that make offers early R1 COM</p> <p>You know they do their selections in a different way so that's one of the ways that they do it as well. They go and there are some faculties who look at the final grade 11 and see okay... R1 COM</p>	Late Selection decision from Faculties within the various institutions R1 COM
Selection Processes (Matric Results)	<p>... we sometimes find students in the year with their final grade 11 and their June results they don't actually perform that very well and you will receive regrets statuses from institutions and then they get their final NSC and they perform exceptionally well and from our side what we do is that we send an institution a list to look at of all these people that are really sitting with these high points... R2 CAOM:</p> <p>R2 CAOM:And they are sitting with regret statuses and we are sitting with UKNZ, DUT number one choices that they would like to go to that university... the university of technology but we seem to keep on side-lining these people.</p> <p>We send the list but they don't actually work through it so that's the challenge at this point on how we are going to get them to look at it because we are really loosing good applicants. R2 CAOM</p> <p>Rather than taking somebody that walks in, in Jan. R3 CAIM</p>	Students with regret statuses that want to be reconsidered after they have improved their marks on the final matric results are not reconsidered for admission. R2 CAOM, R3 CAIM:
Students with improved results	<p>Eh... eh another challenge would be that eh a lot of programmes want the ranking order of their choices as they want their programme choices number now we as an applicant even though we have R2 CAOM</p> <p>Or they will send us or they will change their mind where they change their programme choices and we re-rank those choices for them but the institutions here as well don't always go back and look to see if this person has re-ranked that choice. R2 CAOM</p> <p>No, the institution then puts it across to say that we haven't met our ranking as yet so that's second choice is not going to be your choice number one so we are not going to look at it. R2 CAOM</p>	Students changing the application ranking order because institution consider only first choice applications. R2 CAOM, R4 CITM

	<p>You need to put it as choice number one and then we look at it so that's how they come in. Make it choice number one to get looked at. R2 CAOM</p> <p>Because you see what happens is that the school, the... the university don't go back and look at it and that has been a big problem, you see they are always sleeping that up. R4 CITM</p>	
Transfer and International Students	<p>No we don't do internationals for UKZN They do it themselves they have their international office. R1 COM:</p> <p>They do it themselves. R4 CITM</p> <p>At another institution so if they have a UKZN choice and they are international, we won't process that choice for UKZN. R3 CAIM</p> <p>So there is different ways in which the intuition handles their internal transfers...R1 COM</p>	No standard practise for dealing with different categories of students. R1 COM, R3 CAIM, R4 CITM.
IT systems	<p>... I think at <i>this point we are looking at how interactive</i> we can get ITS eh with the CAO eh database where we can actually have if they write something we can have that information so we can upload it and the same will happen that side. The daily staff will now be you on the flow you know like in real time eh kind of ideas extract and eh be able to work. R2 CAOM</p> <p><i>(Talking simultaneously)</i> All ITS. R4 CITM, R2 CAOM</p> <p>...eh we also make sure that our systems are up and running whether it is via the internet or whether they are using our systems directly and eh and normally you know if you need any assistance you would normally phone our IT or our support station R4 CITM</p>	The need to have interaction between ITS and the CAO It system. R2 CAOM, R4 CITM,
Customer Relations (Universities as their Customers)	<p>Okay, we do have what we call a user group meeting okay. The first one is where the CEO speaks to his participants etc. but we have been... I mean he does highlight you know the fact that there is this all these applicants who now eh got good results but we are taking somebody off the streets. R1 COM</p> <p>So they are quite specific when you go and target using their own log on for their faculties of what you are sitting with and so the customer service department. There is a lot of training that goes on during the year where we go and keep on re interacting R2 CAOM</p> <p>...if you need any assistance you would normally phone our IT or our support station our customer service department and normally they would get a <i>prompt response to whatever whether they wanna send an sms to us or whatever (Inaudible 57:00)</i> they normally send it to our customer service department... R4 CITM</p> <p>We also send our staff to the institutions during the registration period to help with the registrations. Like if maybe the institutions need us to help with the walk ins. R3 CAIM</p> <p>The E communications department go in after that and do it they will also deal with all your queries you know...</p>	<p>CAO has user group meetings and training session for staff at institutions. R1 COM, R2 CAOM, R4 CITM, R3 CAIM:</p> <p>E communication Department dedicated to addressing e mail enquiries R2 CAOM</p>

	R2 CAOM Eh via email they will deal with your emails for you so you have everything, written communication. A lot of people love to have the written communication which is understandable. R2 CAOM:	
Call Centre Operations	Now what I didn't mention while we are on phones, we have an inter active voice response called an IVR so eh it operates at night and at public holidays so you can do a status check. R1 COM You either put in your ID number or your CAO number and you select what you are looking for, what option you want, if you wanna know your status of your application it will read back the status or there's a payment outstanding, you want the contact details for the institution if you just dial our call centre. R1 COM: You will first be taken to the IVR menu pretty much like if you phone Cell C... But it interrogates the data in real time... R1 COM:	Cao has a 24-hour call centre with and IVR system for clients which interrogates the system real time and give, feedback on various aspect of the application. R1 COM
Factors Facilitating CAS		
Category	Response	Coding
Internet Access	And what we have found is that eh here in KZN especially we have got a lot of rural and they don't have access to <i>computers to apply online, they don't know how to use a computer even if they had it.</i> R1 COM R1 COM: And what we find is even people with computers and I mean I am talking about lawyers... They come into reception and they tell you 'no, I want to make sure I have handed it in here' Jar you know they want to give it to someone. R1 COM	Some areas of KZN don't have access to internet. R1 COM: Please have internet access but still prefer to be assisted at the CAO R1 COM
Implementation of CAS, (CAO Perspective)	I think each province should have an office of their own or there should be hubs. It would be I... I think there would be too many challenges. Which is not true, there are a whole lot of other processes and procedures that are followed to make sure that the applicants information is provided as <i>accurately as possible to the institution</i> and I certainly can't... I can't see it being done in province. You would need I mean for example there is... we have a language barrier problem as well. R1 COM R1 COM: You gonna have to employ people you know that can... there's 11 official languages... So we also have a call centre that is designed to take all the questions and queries and handle the status checks and everything. R2 CAOM	CAS should be at a provincial level or in hubs R1 COM Call centre that functions with operators that can speak and understand all 11 languages. R2 CAOM, R1 COM

<p>Late Applications</p>	<p>Yes, they come in to apply for anything. Yes ‘what is available?’ R1 COM Jar that is the question ‘what is available’ ‘what can we look at now’ you know ‘we didn’t expect that we gonna do so well that is why we were reluctant eh to this late’ R2 CAOM Of the number of people that come here eh this year was eh different in that DUT said that they are not taking. R1 COM Eh UKZN still ran its clearing house but that I believe they have done away with it, there will be no clearing house in January. R1 COM</p>	<p>Dual Processes at CAO and at the various Universities R1 COM, R2 CAOM,</p>
<p>Single Application Fee</p>	<p>And I would say why, it’s because here in KZN right you are applying across institutions... For one fee and all the admin work is done here whereas in other provinces you have to pay a fee at each institution that you go to. R1 COM: Yes. <i>(Laughs)</i> that one I think is our... our line... One form, one fee. R2 CAOM: Yes, I think that... I think it makes a difference for people’s pockets. R2 CAOM: Jar it does. R3 CAIM A big difference we must think of all these parents out there who are trying to get an education for their child and how difficult for some of them it is. You know we actually had one bursary applicant who his dad went and sold a cow to get the money to send him and then go. R2 CAOM: So as much as we can, we try and help and that... it is only that application fee that sustains a CAO so we don’t get any monitory value for anything else that we do other than that application fee and that’s how it runs. R2 CAOM Students can apply from 5-6 choices so whether they want 5-6 choices whether they want 1 choice... R4 CITM:</p>	<p>Applicants pay a single fee to apply for 6 program choices at the institutions. R1 COM, R4 CITM, R3 CAIM</p>
<p>Communication with students</p>	<p>We communicate eh first thing that we send them is an acknowledgement letter... R1 COM: And in that acknowledgment letter it contains the information that the applicant provided us with and asks them to fill in any gaps or correct any... R1 COM: Then that comes back and then we update the application eh they get an sms as well when their application has been processed, if they haven’t paid their fee eh they will get ... R1 COM Reminded via messages, invalid payment letters. R1 COM: They get offered eh... R2 CAOM <i>(Talking simultaneously)</i> that they have underpaid, they get an offer sms if they get an offer. R1 COM</p>	<p>Each time there is an update on the students record, the CAO sends various commination to students, these system generated letters or SMSs R1 COM, R2 CAOM</p>

	<p>And there is an sms if they get regretted so it allows them time to change their programme if they want to. R2 CAOM</p> <p>The system triggers off communication based on what we do. R1 COM:</p> <p>Like this change of mind when its processed they get notified and they get a change of mind letter. R1 COM</p>	
Benefits for the Universities	<p>Another thing is it will be beneficial for the institution to send the forms here because they don't have to capture obviously. R4 CITM</p> <p>Jar. R2 CAOM</p> <p>And then the matric result and all will be updated you know. R4 CITM</p> <p>And given to them at the beginning of the year. R4 CITM:</p> <p>we send an output to them so that they can make decisions and selections and things like that to update their data base and eh we also R4 CITM:</p>	<p>Universities don't have to capture application information and they don't have to upload the matric results R4 CITM, R2 CAOM</p>
Accurate Application Information	<p>We ensure that all the application information provided to institution is accurate as possible within the SLA turnaround time. Within the right timelines. R2 CAOM</p> <p>And eh we also make sure that any other data is given to them daily at about 3 o'clock in the morning. R4 CITM</p> <p>So eh you know they are always up to date with that information and our customer service department and normally they would get a prompt response R4 CITM</p> <p>I have to ensure that we meet our service level agreement which has a turnaround time for each institution. We have to process and quality control the work within 15 working days. R1 COM</p>	<p>CAO provides accurate application information within the right timelines. R2 CAOM, R4 CITM, R1 COM</p>
Data Quality and control	<p>Eh and there is also a quality control check that happens in there and we do matric merging where we eh merge the applicant information to the DEB data base and download all the information eh R2 CAOM</p> <p>Eh and then from data capture eh it goes to finance for payment checking and then it goes to eh call centre for another quality control check. R2 CAOM</p>	<p>CAO captures applications and does data quality checks R2 CAOM</p>
Student recruitment	<p>We also bulk post eh our handbooks and application forms to schools so once we receive it, it takes about 3 days and we send it through... across KZN to all schools who have sent to us previously we send out bulk. R2 CAOM:</p> <p>You know and provide the information ... And we also eh our staff eh customer service go and I think beginning of the year and mid-term as well. They go to like for example eh shopping centres... R2 CAOM:</p>	<p>CAO has various methods of giving application information to students. R2 CAOM, R2 CAOM:</p>

	<p>We still cater for that in that if you specifically want to phone our call centre or you request in writing or send an email and we post you a personalised application form and handbook. R2 CAOM:</p> <p>We attend a lot of fairs and career exhibitions as well. R2 CAOM:</p>	
<p>CAO Handbook</p>	<p>Yes, all this information that we have provided because eh it's a very meticulous process because we sit here with a fine toothcomb we make sure and also take into consideration R2 CAOM</p> <p>and look at the second language, third language because if everything that we are saying is making sense then that person, that student sitting opposite there... is that person gonna understand because it's not for us it's for them. R2 CAOM</p> <p>So it's a very two and from process we actually have our different teams that get set up. There is one for the design, there is one for the programme, there is one for the content and there is a whole lot going on to make sure that yes that applicant is gonna understand, that's the focus. R2 CAOM</p> <p>R2 CAOM:To make sure that the applicants understand what we are trying to get across.</p>	<p>Efforts that goes to the development of the CAO handbook to ensure that the students understand the information provided R2 CAOM</p>

Appendix 13. Reduction of Focus group interview- data reduction -DUT

DUT FOCUS GROUP DATA SET		
Category	Response	Codes
Admission Challenges	FDP4: Eh one of the frustrations is eh, plenty of applications coming every second (<i>People talking in the background</i>) so you can leave the system today eh leaving 50 applicants and then when you come tomorrow there is maybe another 200 applicants who are already on that system.	Increased workload due to large number of applications receives FDP4
Post Office Strike	FDP3: Post office strike (<i>Laughs</i>) FDP3: Like last year there was a post office strike. FDP3: So we were sending out letters to applicants but they didn't reach them in time. FDP3: So it was kind of a problem and also dealing with those applicants who applied eh and they miss the requirement, they come here and they shout asking why we regretted them.	Post office strike affected the delivery of letters to students FDP3
Admission Requirements (Lack of understanding of the Admission Requirements)	FDP3: So you have to explain to them and tell them that you do meet the points and the points are fine like eh for example math is 01 in maths we need 04 or 03. FDP4: Jar like the procedure for selection, once they finish matric they think they can go to any institution and go there. FDP4: Eh usually the students (<i>Someone talking in the background</i>) don't understand some of the things. FDP5: ...though there are those people who still don't understand the system and the functioning of the system or how it is operated eh I believe CAO is good, CAO is doing well... FDP2: Yes. FDP3: They will say eh 'taxation' but then they wanna know what is taxation and what it is all about because they don't know anything about taxation.	Students do not understand the admission criteria and how the selection procedure is done FDP3, FDP4 Some staff member don't understand how to use the CAO system FDP5
Knowledge about programs		Students don't have knowledge about the University programs FDP3

CAO and Career Fairs		
Career exhibitions	<p>FDP1:Yes, yes, yes (Someone coughing in the background)</p> <p>FDP1, FDP5:Yes.(Simultaneously)</p> <p>FDP1:I think that eh they haven't reached to other places.</p> <p>FDP3:Like rural areas.</p> <p>FDP2:They go to towns like and some townships they don't go deep rural areas.</p> <p>FDP1:Yes.</p>	CAO does not have enough rich to schools in rural areas FDP1, FDP5 FDP3 FDP2
Views about what the CAO does		
<p>Student Recruitments</p> <p>Cao as an agent for Universities</p> <p>Applications management</p> <p>Capturing the DUT requirements</p> <p>Capturing applications</p> <p>Colour coding for selection</p>	<p>FDP4:It's eh recruiting and selecting the students for all the universities.</p> <p>FDP2:In other words, I can say just to add, it's like an agent working in relations with DUT.</p> <p>FDP2:So that we can view applicants from the CAO system, ja and it makes easier for the university to... to...</p> <p>FDP1:Handle the applications.</p> <p>I:Eh and they are doing fine as far as you are concerned?</p> <p>FDP4:Yes they are doing fine.</p> <p>FDP4:They are doing fine. (People talking in the background)</p> <p>FDP2:So what the CAO does in fact they take the requirements for the programme...</p> <p>FDP2:And they capture it on the system and as they are capturing the applicants let's say they are capturing your marks and if you do meet the requirements then there will be a colour coding.</p> <p>FDP1:Capturing of applications.</p> <p>FDP2:So it's makes it easier for us to say 'okay this colour coding means that this applicant qualifies for this programme'</p> <p>FDP2:So there is no need to even view the entire application so I believe that is what the CAO does for me.</p> <p>FDP2:It makes it easier for me to pick up those who meet and don't and those that I have to view the application, the actual application and those that I don't have to view at all.</p>	<p>CAO does students recruitment and selection for university FDP4</p> <p>CAO handles the capturing applications and work as an agent for the university FDP1, FDP2</p> <p>CAO captures the universities admission criteria to makes selection of students easy using the colour coding system FDP2</p>
Walk ins	<p>FDP2:Jar because if eh there was no CAO you can just imagine the walk ins.</p> <p>FDP1:The load.</p> <p>I:Mhm. But you still have walk ins?</p> <p>(All):Yes.</p> <p>I:You still have walk ins?</p>	CAO assists the university with management of Walk ins and reducing the work load FDP1, FDP2

	<p>(All):Yes. FDP1:Yes, we do only a few. I: Only a few? FDP2:Yes, but we only consider those who applied first, we only take walk ins only if we see that we are not meeting out numbers. FDP2:Yes, because we only consider those who applied first, we only take walk ins only if we see that we are not meeting out numbers. FDP2:Yes.</p>	<p>Late applications are only considered after early application have been finalised FDP2</p> <p>Walk ins are considered only of there is still place available in programs after processing the early applicants FDP2</p>
Time Lines		
<p>Closing dates</p> <p>Online Applications</p> <p>Staff</p> <p>Late Applications</p> <p>June Results</p>	<p>FDP1:Yes, that does happen but then for instance let's say the programme was closing on the 15th of August...</p> <p>FDP1:And then you will still get online applications maybe until the 30th of September and that's due to the backlog that they are having there.</p> <p>FDP1:They are still capturing.</p> <p>FDP1:Yes, so maybe they are short staffed or something</p> <p>FDP1:If it's a late application then we don't view it.</p> <p>I: Okay.</p> <p>FDP3:To add on that (<i>Laughs</i>) do you know why applicants don't apply in time?</p> <p>I:Mhm.</p> <p>FDP3:Most of them they know that we are using eh June results so some of them they fail in June and they don't apply.</p> <p>FDP3:They only apply after.</p> <p>FDP2:Yes.</p> <p>FDP1:Ja.</p>	<p>Sometime the university get applications after the closing date due to backlog at the CAO FDP1</p>
<p>CAO Colour coding system</p> <p>Capturing errors</p>	<p>FDP1:Eh me I normally deal with the red colour coded. (<i>All laugh</i>) which are not met.</p> <p>FDP1:Yes, eh I view the people that eh doesn't meet the requirements.</p> <p>FDP1:Eh in that category there are people who... who sometimes there are people who meet the requirement but just because of eh maybe because of the capturing...</p> <p>FDP1:The capturing was wrong and other people in that category are people who are...</p> <p>FDP2:Still upgrading.</p> <p>FDP1:Still upgrading.</p>	<p>CAO uses different coding system that clearly identify students meeting the criteria and those that do not FDP1 FDP2 FDP3</p>

Walk ins	FDP2: And they applied on time?	Students wants to come personally to check their status because the Department delays FDP1 FDP5
Customer Service		
CAO service to students Courses of complains	FDP1: That's a very difficult one to answer because we weren't here back then but then so far I think everything is good. FDP1: Maybe she can answer for that. <i>(All laugh)</i> she has been here for more than 15 years. <i>(Reference is made to participant FDP5)</i> FDP2: Oh we do get complains. I: Mhm. FDP2: But then those complain are caused by <i>(Inaudible 19:50)</i> FDP2: Those complains are caused by the institution itself. FDP2: It's not the CAO. FDP2: So even an applicant let us say the applicant applies in January or March or something. FDP2: And the applicant is applying for the next academic year. FDP2: So the institution doesn't open that application straight away, they wait maybe when we are close to the closing dates... FDP2: Then only we... we... we know that we have to view the applications now. FDP2: But then all along from March, June, July, August September the applicants have been waiting for the decision and then the applicants thinks that the CAO is not responding to us. FDP2: If DUT did the selections in time then obviously the applicant wasn't going to ask those questions. FDP2: But then it's the institution that is not responding.	Students complains are coursed by the fact that institutions are not doing the selection on time and responding to students. FDP1 It is the institution and not the CAO that makes a decision on when to look at the applications, they can decide to wait for the closing date then start the selection processes. FDP2
Application Process	FDP2: Mhm so that's the problem that we have been... we have been facing, sometimes applicants even ask 'can't I apply directly to DUT' because it's like they don't trust the CAO and yet... yet DUT is doing the selections. FDP2: <i>(Laughs)</i> the only way of applying is through CAO. FDP1:CAO. FDP2:Yes.	Students sometimes feel that they want to apply directly to the DUT and not the CAO as if they do not trust that their application will be processed. FDP1 FDP2
Application Fee	FDP5: Yes, with CAO its one payment for all the higher education institution so it's a great benefit to the public as a whole. <i>(People talking in the background)</i> FDP2: Jar it is good.	CAO offers one application fee payment for all institutions FDP5

Customer relation and Staff satisfaction		
<p>Staff satisfaction</p> <p>Customer service</p> <p>Response time</p>	<p>FDP5:They have always done well. FDP1:Oh. FDP2& FDP1:Yes. FDP2:Yes, satisfied FDP3:And their service is good too. FDP1:Yes, it is good. FDP5:You would call them and you have a query you know they solve the problem quickly. FDP2:Very prompt. FDP5 sometimes the CAO colour codes the students incorrectly FDP2:If you have got a query you just drop an email to customer service within maybe 30 minutes they respond to you. FDP3:Mhm. FDP2:And for our students eh I am not sure with regards to our students. FDP3:Mhm. FDP2:I am not sure. FDP5:I think... I think they are prompt because once you make an application your details are on the system, as soon as the institution makes a selection... FDP5:Obviously the status changes on the CAO and then... and then the applicant is able to view wherever they are (<i>Someone coughing in the background</i>) you can view your status on the system. FDP1:Yes, they are prompt to the students. FDP1:I made an application this year for my sister so as I was making that application, I made it online. I had to fill the declaration forms so I printed the form and then gave it to her she signed it and then I called as a student and I said ‘my name is this, this, this’ FDP1:‘I just wanted my eh what you call my easy pay number’ FDP1:Straight away they gave me the easy pay number. FDP1:So I think they are very prompt.</p>	<p>CAO have a good service and respond calls and queries promptly. FDP1 FDP2 FDP5</p> <p>CAO offers prompt response to students FDP1 FDP5</p>
CAS		
<p>Work Load</p> <p>Capturing errors</p>	<p>FDP2:Overload of applicants. FDP4:Time. FDP3:Making mistakes. FDP4:Ehmm time in a sense of data capturing. FDP3:The service.</p>	<p>The national CAS will have increased workload and more data capturing errors thus affect the</p>

<p>Applicants want to hand deliver their forms</p>	<p>FDP4:One office for the whole country? FDP3:Yes. FDP4:It's too much. FDP2:That needs to be a huge place because sometimes eh applicants want to go to CAO directly. FDP1:Disaster (In the Background) FDP2:There are those that ask 'where is CAO' and you have to direct them where is CAO. FDP3:Mhm they want to go there. FDP2:They want to hand deliver the forms and they want to pay at CAO. <i>(Laughs)</i></p>	<p>service to students. FDP2 FDP3 FDP4</p> <p>CAS maybe a challenge as a national office because sometime students want to go directly to CAO. FDP2 FDP3</p>
<p>Internet Access</p> <p>Access to technology</p> <p>Staff's personal experience about first time experience with a computer</p> <p>Student Background</p> <p>NSFAS online Application</p>	<p>FDP1:It's online? FDP3:Online? FDP1:What about paper based application? FDP2:Mhm. FDP3:Mhm. FDP5:What about people who done have access to internet? FDP2:Yes. FDP5:Because you may have access to the internet on the phones and then there are those who can't even afford to have a simple phone. FDP2:Would you believe it if I tell you that the first time that I used a computer was at DUT, fully use a computer. FDP2:It was at DUT when I was studying here, I didn't know what was going on before. FDP3:And you were scared of the mouse. FDP2:Jar. <i>(All laugh)</i> FDP1:And when you were tying you would be slow. <i>(Someone coughing in the background)</i> FDP2:So we have to think of those people who come from disadvantaged communities. FDP5:For example, look at this now eh the financial aid has been taken off by the government. FDP5:Especially those who live in rural areas. FDP5:Look at the disaster that is happening we have students who did well in their exams but they cannot get financial aid. I:Mhm. FDP5:For whatever problems so now if we move again to online ay I think it is going to be too much. FDP2:Mhm. FDP5:Because they still have to submit the... the... the papers I mean the documents needs to be submitted to the CAO basically it's the same process that is followed by NESFAS.</p>	<p>If CAS do away with paper applications and uses online application platform what happens to those that do not have access to internet. FDP1 FDP2 FDP5</p> <p>Access to technology is a serious matter as some students have never seen a computer before especially from disadvantaged communities and from rural areas FDP2 FDP5</p> <p>Reference is made to the fact that the national Financial aid application system excluded students from getting financial aid FDP5</p> <p>Applicants still need to submit academic application in a different</p>

<p>Application Fee</p> <p>Affordability</p>	<p>I: Jar. FDP3:And there are students who do not have the internet. FDP5:<i>(Cutting in)</i> they don't know where to scan... FDP1:What they can do is that they can charge more for paper based application and less for online. FDP2:(Laughs) FDP1:It's the same R200. FDP3:R200. I:R200? FDP1:Yes. I:Is R200 a reasonable fee for everybody? FDP1:It's reasonable.</p> <p>FDP5 CAO works charges I fee which is making it cheap for parents, system works well has stats. Even the government can see how may matriculated have applied, met requirements. They can tell what happens to the student that did not meet the requirements. FDP1:Yes.</p>	<p>system and have to apply for NSFAS financial aid using a different system FDP5</p>
	<p>FDP2:As a student you won't think of other things such as the expenses that CAO is facing. <i>(Cell phone beeping in the background)</i> FDP2:For example, sending out sms, letters, capturing and all of those things for R 200. FDP5:Printing out of the books and the forms. FDP1:Yes, I think it is reasonable, if you put yourself in the CAO shoes not the applicant. FDP1:Yes.</p>	<p>The work that goes with the application process, the application fee is reasonable. FDP2 FDP5</p>
<p>CAS Approach</p>		
	<p>FDP4:Regionally. FDP4:Jar regionally. FDP2:If Unisa did it, CAO can do it as well. FDP4:Jar because South Africa is a vast country so if we have only one office. FDP4:No that wouldn't be working well... FDP4:At least if there are regional offices it would be better because even the universities here in South Africa are in some of the regions. FDP4:Not online but in provinces.</p>	<p>CAS should have regional offices FDP4</p> <p>Registered students collect forms for their families at home therefore it would be better if it is regionally</p>

<p>Current students take forms for families back home</p> <p>CAS to be regionally based Job opportunities are a possibility with the CAS</p>	<p>FDPI:To add there...</p> <p>FDPI:Most applicants that come here, students that come and take CAO forms eh what they say is that 'I am taking for my brother, I am taking for my sister'</p> <p>FDP3:Jar.</p> <p>FDPI:Back home.</p> <p>FDP2:Give me two forms I am taking for my cousin back home.</p> <p>FDP1:Yes.</p> <p>FDP2:I want to give them when I get there because I won't go back there.</p> <p>FDP4:Some are coming from Eastern Cape.</p> <p>FDP2:Yes, yes, yes.</p> <p>FDP2:It would be better if they had branches, CAO Eastern Cape...</p> <p>FDP2:CAO Johannesburg, CAO KZN.</p> <p>FDP2:Mhm so it will be easier for the distribution of forms and the places there.</p> <p>FDP4:And there will be more jobs (<i>All laugh</i>)</p> <p>FDP2:True, true.</p>	<p>based to increases access. FDPI FDP4 FDP2</p>
	<p>FDPI:Academics they focus on their work and that is lecturing one way.</p> <p>FDPI:So they don't get time to view the applications.</p> <p>FDPI:And yet they are handling the application for their prospective departments.</p> <p>FDPI:So I think that is delaying the entire process, yes. That's what is delaying the entire process.</p> <p>FDP3:Jar.</p> <p>FDP4:Yes, I feel the same because eh there is different faculties eh one faculty will view the applicant first while the other faculties they are still busy with something else.</p> <p>FDP4:You see?</p> <p>FDP4:An applicant will come here and say eh "eh they responded to me in engineering but in human resource, HR they didn't respond, how come?"</p> <p>FDP4:Then you will have to explain.</p> <p>FDP4:And tell them that they haven't made the selections yet.</p> <p>FDPI:We as the admissions clerks is that eh we don't admit unless we are given permission to do so by the... by the respected departments.</p> <p>FDPI:But what we do is that we regret whoever doesn't meet the requirements, as long as... as soon as we see that okay you don't meet the requirements then straight away we regret.</p> <p>FDPI:There is no need to wait up until the last minute to be regretted.</p> <p>FDPI:So that is what we do and then...</p> <p>FDP2:We have got authority to do regret but then to give an offer that is something else.</p>	<p>Delay in selection decisions from the academic divisions as they focus on teaching. FDPI</p> <p>No agreement with the faculties as to when to start working on the applications as some result students will not get response at the same time. FDPI FDP4</p> <p>Department have the authority to admit the students therefore admin staff must wait FDPI</p>

	<p>FDP4:I think eh...</p> <p>FDP3:We have the meetings with all the faculties.</p>	
Effectiveness and Efficiency		
Data capturing Error	<p>FDP1:Yes, it is effective.</p> <p>FDP1:Jar because eh in January I was working with the management science in registration.</p> <p>FDP1:Some of the students were not aware eh he or she can sit on the line for one or two minutes and then after that (<i>Clears throat</i>) he or she is done with the registration.</p> <p>FDP1:Then the other students will come and then they will say ‘you are done with registration’ then ‘ja I am done’ you can go home fine. ‘So fast, so nice’ so those are the kind of experiences that we would like to see in the future.</p> <p>FDP1:Eh through applying with CAO firstly you have to apply thought CAO, if you apply through CAO things will be easier for you if you have to register in January.</p> <p>FDP1:Okay because ll the information is there.</p> <p>FDP2:And you don’t have to walk all over with this and that.</p> <p>FDP2:If you applied through CAO you can even register at home.</p> <p>FDP2:Yes, you can register at home online.</p> <p>FDP2:If you apply online, if you apply through CAO (<i>Someone coughing in the background</i>) basically we release you for registration and then we will tell you the registration date is on Thursday, on that registration date you just come through just to produce just your documents to us just to bring your certificates and your ID just to confirm that you do meet the requirements then.</p> <p>FDP3:But sometimes they do make a mistake when it comes to results.</p> <p>FDP3:Only to find that the results that they bring is not the same as the one on the system.</p> <p>FDP2:And sometimes the applicants do forge them.</p> <p>FDP3:It’s the CAO.</p> <p>FDP2:It’s the CAO but sometimes the students do forge them sometimes.</p> <p>I: But then where... where do you do you verify? I mean I have got a paper and yet there is a download from the department. Who... which one do you take, if the paper that they are carrying...</p> <p>FDP3:We will tell you to go to CAO (<i>Laughs</i>) to correct the mistake and bring the certificate because we found that the one you have is not the same as the one we have.</p>	<p>Students that have applied through the CAO are able to register easily online so it is effective FDP1 FDP2</p> <p>CAO captures wrong results sometimes FDP3</p> <p>Students submit result that differ from the system and are fraudulent FDP3 FDP4</p>

Fraudulent Results	<p>I: Okay no that's fine; it is effective in your opinion? FDP4:Yes. FDP1:Yes.</p>	
<p>Internet</p> <p>Paper Applications</p> <p>Online payment</p>	<p>FDP1:Well in South Africa it shouldn't be. FDP1:It shouldn't be so important because eh there's stat that was produced from the CAO that showed that paper based application and the online application... FDP1:If you look at the difference there's more paper based application than online application. FDP1:Well with online application it was like 20% and paper based application was like 80%. FDP1:So you cannot just do away with paper. FDP1:Yes, you can't just do away with paper. FDP2:And they always prefer to use paper even if they have internet but they always prefer paper. FDP1:They always prefer paper. FDP1:They don't trust. FDP4:(Talking simultaneously) trust. FDP2:They don't trust it. FDP2:Well the internet is good because as soon as you apply online it is on the system same time, while you are applying you are capturing it yourself. FDP2:You are capturing everything yourself so well its good in a way but then... FDP2:Yes. FDP4:You know I have a grandfather... FDP4:He doesn't use a bank to keep his money. <i>(All laugh)</i> FDP4:Jar so he prefers to keep his money at home. FDP2:Old school. FDP4:Jar. FDP4:Because he doesn't have.</p>	<p>According to the CAO there are more paper applications than online applications and that student still prefer paper submissions FDP1 FDP2</p> <p>Online payment is an issue as some parents don't have credit cards and don't trust the online systems. FDP1 FDP4</p>

Comments about the CAO	FDP5 The CAO is an external the centralised office that deals with all our applications.	
Personal experience	Applicants submit their application to study at DUT	
CAO System	FDP5: CAO works for all institutions and technical colleges in KZN	
CAO System	FDP3: I think they are doing a good job.	
CAO System	FDP3:Jar.	
CAO System	FDP1: I don't have much to say. I highly recommend CAO. Eh because I applied with CAO through the same way. Early and efficiently registered, ja.	Staff experienced challenges working on the CAO system as they don't separate those that are upgrading and those who completed matric FDP1 FDP2
CAO System	FDP1: Jar I think it's perfect.	
CAO System	FDP2: Eh CAO it is a good system... it's a good system to work with but then... oh for the students it's alright eh for me as an end user I have faced a few challenges while working with them.	
CAO System	FDP2: For example, they cannot separate those who are upgrading to those... to those who completed matric.	The CAO is doing a good job, staff highly recommend it FDP1, FDP2
CAO System	FDP5 CAO put information on the system and we can get access to the applications and do selections	
CAO System	FDP2: So they are all in one and so those applications we have to view one by one let's say we have got like 5000 and so everything has to be viewed one by one whether you are upgrading or not but then we have raised that with them and they are currently working on it and they are solving it otherwise it's a good system.	NSC admission requirements are confusing particularly to those that are used to the old Senior certificate. NSC endorsement needs to be outlined to academic department FDP5
CAO System	FDP2: Yes. We need to train our academic staff... our academic staff with regards to the CAO.	
CAO System	FDP2: Once they know how to use it well then selections can be done it time no students will be sitting on the system for a long time.	CAO is a centralised office that deals with applications for institutions on KZN FDP5
CAO System	FDP1, FDP2:Mhm.	
CAO System	FDP5 We have a challenge with the department they are always busy	
CAO System	FDP5: You know there is something that puzzles me with regards to this new curriculum; I am from an old school.	The CAO captures information and the universities can get access to make selections FDP2 FDP5
CAO System	FDP2:Mhm.	
CAO System	FDP5: I only know higher grade and lower grade and what?	
CAO System	FDP1, FDP2:Standard.	
CAO System	FDP5: But with this new curriculum it talks about diploma pasts...	
NSC Results		

	<p>FDP5:And endorsement and that is eh... eh confusing for the people that do the selection in the departments because for an example if somebody wants to do fine arts.</p> <p>FDP3:Eh the qualifying point is 3 in English and 3 in other subjects.</p> <p>FDP5:Then you will find that the applicant does have that but then in total the students has about 17 points which he does meet the requirements for the course but then does not meet the institutional requirements and you find that people are not aware of that.</p> <p>FDP5:That's the thing that I am trying to highlight that I think the CAO needs to look at that because recently we had a meeting with the faculties, the academics were talking about the same thing saying there was a student whom they called from an interview but at the end they realised that the person does not meet the institutional requirements</p> <p>FDP3:Mhm.</p> <p>FDP3:Yes.</p> <p>FDP3:Mhm.</p> <p>FDP3:Yes exactly.</p>	
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Appendix 14. Reduction of Focus group interview transcripts -UKZN

Code	Category	Responses
Your experience in terms of the application process		
CAO need to be efficient in their call centre FUP1	Efficiency in the Call Centre	FUP1: I work with the admission 15 years in the school eh CAO is...it one of the output process, but it need to be more efficient for the call centres and
Amount of application fee needs to be reduced. FUP1	Application Fee	FUP1: I think when each year the students apply when you look at it saving cost in one way but in another way with a CAO every year you have to apply you have to pay the application cost people in time now in some of them it difficult to pay that R100 or R150 so I think they need to reduce that fee.
Centralised model is better, even though the University is not saving costs FUP1: CAO is Efficient the decentralised had a backlog of application FUP3, FUP6 CAO makes capturing mistakes FUP3	Application models	FUP1: I would say it should stay as the central the University says they want to save the cost, but I think it is not saving costs due to student's application. FUP3: I think CAO is efficient in the way it where they have the capturing going because with the old University system we had the
with regards to the application process what would you say are your main admission challenges that you are affected with, what are your main challenges?		
Delays in the admission process of transfer students due to missing documents, that are not yet downloaded FUP8	Application Process	FUP8: yes, the biggest challenge and the availability of information, in the system CAO works best with the current applicants, yes FUP8: the applicants that are applying for a transfer are difficult to do because of the download of the documents and other documents that are required that would support the application so straight forward matriculates there is not a challenge beside a document.

<p>Data capturing errors where information is incorrect or missing, this has an impact on the downloading of matric results and institutions loose good students FUP8, FUP5</p> <p>Not dealing directly with the students to get the documents missing FUP7</p>	<p>Data Capturing errors</p> <p>Documents not downloaded</p>	<p>FUP8:Some of the data capturing could be significant like for example core maths subject could be captured like maths literacy subject has meet requirement like to meet the required requirements so besides the data capturing error for straight matriculates there is not it easy to make selections</p> <p>FUP8:the biggest challenge that we have is systems when the download happens if what they capture does not measure with the IDs we have in the system on this side and the we have the challenge that doesn't download because the information is not matching or if they haven't captured the sex of the student if a male or female our system will not read it we might not download the application system.</p> <p>FUP8:And it could be one of the top students</p> <p>FUP7:I think another thing could be the not dealing directly with the students the lack of documentation that we don't see in CAO and on the other hand students omit information where it missing here or it is fraudulent.</p> <p>FUP5:I agree with ..with regards to the information that is not provided to the application</p>
<p>Admin staff take long dealing with incomplete applications FUP2</p>	<p>Data Capturing Errors</p>	<p>FUP2: With me I would say on CAO the challenge is I never understood when they capturer applications that are incomplete where you would be seeing applications that are...eh because we deal with those applications in given time maybe a week you have to spend certain hours dealing with admissions only to find that you have too many applications that are incomplete and</p>

<p>Students not informed when to start dealing with the University FUP2</p>	<p>Communication</p>	<p>FUP2:they are not told that by December you have to be dealing with the institution directly and then the person will be too low to provide the information and then they end up losing those applicants.</p> <p>FUP2:Yes, but I'm not too sure in terms of the applicants if the information is convey to them because you will find people calling saying but I have submitted this and this and this.</p> <p>FUP1:Yes, true.</p>
<p>Students applying online are omitting information themselves FUP7</p>	<p>Online Application</p>	<p>FUP7:I think another thing is the CAO they should be applying online themselves that is where the problem starts with the information missing they are allowed to apply and capturer their own application even payment be still their part of application to support the application we should see everything complete.</p> <p>FUP8:They shouldn't be allowed to complete application without mandatory fields, it's like they don't have mandatory fields</p> <p>FUP8:Yes, because that is a very huge...huge issue when it comes to the data capturers errors which we have to now fix after the registration process because now we get pages of reports with missing information there is basic staff like id number, race and those should be mandatory fields it shouldn't be allowed to capture the incomplete application unless there is none.</p>

<p>Not enough codes on the CAO system to identify different categories of students FUP7</p>	<p>Identification Codes</p>	<p>FUP7:I think one problem which come with all is that we don't have enough codes on CAO to actually request what we exactly looking for example if the student matric it straight forward and easy but for other students FUP7:if there is a gap of three years or international more codes to request them that because we don't know what they have done in those three years but it would be nice if can have more codes I know it has always been a problem a huge problem to add more codes... FUP7:Because those codes will need to read it to our system, DUT system I think those people needs to they haven't understood that they need to understand that it is not just UKZN...</p>
<p>your timeline does the CAO meet your timeline</p>		
<p>All participants agreed that the CAO meets their timelines FUP7, FUP8, FUP3, FUP1, FUP2, FUP6</p> <p>Late Applications are a problem as they are captured but you find that they don't meet the admission requirements FUP3, FUP8, FUP2</p>	<p>Processing Time lines</p>	<p>FUP3:They haven't been... FUP3:Ooh we don't have issues. I: And that is general feeling everybody? FUP7, FUP8, FUP3, FUP1, FUP2, FUP6:Yes. I: And by the time you close application on your data is there? FUP7, FUP8, FUP3, FUP1, FUP2, FUP6:Yes. I: And they don't accept later applications? FUP8: They do. Our closing date is end September and they continue capture late applications for us until December and January we have walk in student that come and apply directly to the university because the CAO is closed. FUP3:And that is a huge problem</p>

		<p>FUP8:we have a clearing house in January to take late applications of people that haven't applied through CAO...</p> <p>FUP8:It a lot of numbers in the last stats that was given can you remember ... it was like couple of 100 were recorded as come in but of those, I think less than 100 were registered.</p> <p>FUP3:Yes (in the background) I: Do you feel you loosing on the data? Argument not audible FUP3:I don't feel we loosing... FUP2:It is unnecessary...</p> <p>FUP2:Most of the time I would assume there are result if there are no results they should be told there and there if however, they want to apply and don't meet the requirement and capturing because half the time these applications come and they don't meet requirements but there are given chance to apply later...half the time application is given application forms but not meeting the requirements.</p>
<p>I would like to find out if...how does the CAO service in your opinion affect your job responsibility...your job responsibility you know if there is goals that you want to meet and findings that you are frustrated that your data is not okay.</p>		
<p>Clients fight with staff due to capturing error that may affect selection offers FUP5</p>	<p>Client Feedback</p>	<p>FUP5:I think in some cases where just say something</p> <p>wasn't captured there and then we haven't made a selection or we have withdrawn and</p>

		<p>that student doesn't qualify and the parent will pick up the phone and say I have come and handed the form we have queries like that we dint give a place to</p> <p>FUP5:the first person to pick up the call they will get the lash (<i>laughter</i>)</p>
<p>CAO affect the Key performance areas which is offering efficient and effective service, in that if data is not captured correctly the students cannot get early offers FUP8</p> <p>Students say they have submitted documents but the university would not have received the documents FUP8</p>	<p>Efficiency and Effectiveness</p>	<p>FUP8:so in terms of our KPAs we need to look at our goals and objectives are and our key performance areas plus our key performance areas is providing efficient and effective services and</p> <p>FUP8:it does hinder to us providing an efficient service if we don't have accurate data and the documents hasn't been uploaded like for example in our office if they don't capture the latest result by the time we are doing early offers and that person is a student we would not give him early offer but will fill up the student result so</p> <p>FUP8:the timing is very important that they capturer what is in the good time</p> <p>FUP8:which does not seem to be taking place. The students say they submitted the documents and they contact us and say have had anything.</p> <p>FUP5:Yes, the parent was here this morning so happy she got a place from us but we don't have</p>

		<p>forms at the moment we will send it to you so just wait I mean that could be saving time real.</p> <p>I: Do you agree?</p> <p>FUP2: Yes (laughter)</p> <p>FUP8: We actually have this a our biggest gribes...not having.(what happened to... Inaudible discussion take place between FUP2/5/8)</p> <p>All: Yes (laughter)</p> <p>I: I miss that part but I do get challenges (laughter)</p>
<p>I hear what you say about your timelines but how could the services provided by the CAO to your university be improved?</p>		
<p>Internal system cycles are a problem would have captured that data however system controls will not be effected on the university side. In the meantime, the students are getting feedback from CAO FUP2 FUP8 FUP7</p>	<p>System cycles control</p>	<p>FUP2: I think CAO works okay the problem is information on CAO can transfer to our system whereby you will be told student numbers for that year where you are doing admissions for I don't know whether they not available or installed basically</p> <p>FUP2: I don't know somebody have to do something so that so applications deal with but then it has not downloaded to our system and we have that application not finished downloading.</p> <p>I: So it's not just CAO it your system?</p> <p>FUP8: It's our system</p> <p>All: Yes.</p> <p>FUP7: I think the reality of it the CAO when they are capturing and they process just goes and get busier so they employ more people during their pick period</p>

	Incorrect information	<p>FUP7:but the university I think (<i>laughter</i>) so it can be 6 months after those students have put in the application on that CAO because the student number hasn't been generated we can nothing to help the student with the CAO all of those problem is on our side</p> <p>I: So you need more staff?</p> <p>FUP2:(<i>Loud</i>) No No No</p> <p>FUP2:It the efficiency of the system somebody need to press the button and run the programme. (<i>Laughter and talking simultaneous arguing</i>)</p> <p>FUP7:There is a system that has to take place for...for because we work with the system cycle so there is still 2015 they need to open the cycle it for 2016 and then it always incredible late and yah it's so yah students can be on the CAO system for four months before we can do anything with it.</p> <p>FUP2:Yes.</p> <p>FUP8:Our cycle is still closed so...</p> <p>FUP2: it actually embarrassing?</p> <p>FUP7:Yes it is.</p> <p>FUP7:Another thing against the CAO (<i>laughing</i>) sometimes the information given out by the call centre is not correct not always even now again the call centre person will say no...no this is what is happening you got to contact them because ...</p> <p>FUP7:it could be the wrong information so students or parents are running around</p>
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<p>CAO call centre giving incorrect information at times thus frustrating the parents FUP7, FUP8</p>		<p>FUP8:I think the reason why Cathy is highlight it by the time it gets to us it by the point where the applicant parents get frustrated with the entire system and the contacted 12 people telling you telling them a completely different story so it get out of proportion it is not often but it does happen everybody knows that.</p>
<p>Is the CAO in your opinion benefiting the university?</p>		
<p>CAO provides good service to the university FUP7, FUP5, FUP8</p> <p>CAO system is benefiting the University and it is user-friendly than the Internal ITS system. FUP8, FUP6</p>	<p>Benefits for the University</p>	<p>FUP7, FUP5:Yes. I:Are you all in agreement? All:Yes... FUP7:very much (<i>laughter</i>) FUP8:Most definitely,</p> <p>I:So problems have to be identified but generally it is providing good service for the university? All:Yes.</p> <p>FUP8:Their system is more user friendly than our system we can easily identify the applicants that meet requirements for our programmes comparing to ours.</p> <p>FUP8:Ours is a real manual check that we have to do.</p> <p>FUP6:And it easy to make mistakes with our system and the CAO their system it much easier to do everything compare to our system</p>

		<p>FUP8: <i>(interjecting)</i>you have to download three reports to check one thing <i>(laughter)</i></p>
<p>And the response time are you satisfied with the response time that the CAO provides to you and to students?</p>		
<p>Staff is satisfied with the responses going to students, they send them letters and sms FUP1, FUP2, FUP4:</p> <p>CAO is efficient All participants</p> <p>Staff are satisfied with the CAO</p>		<p>FUP3, FUP5:Yes. FUP8:The response time in terms of after the application? I:I apply I get acknowledged that I have applied. FUP1, FUP2, FUP4:CAO? <i>(Laughter)</i> its automatic yes... FUP2:The problem is with us FUP1:When the application is done immediately after that you get that sms, email and the letter same time. I:So they get an email, letter emmediately FUP5:Just telling them that your application has been received and you got an offer for certain things and you need to call to ensure and it generate a sms so the student is always informed by the CAO. I:So it quite efficient? All:Yes. I:I'm getting that you are satisfied so the next question was what the extent are you satisfied on a scale very or I'm okay and if you not satisfied what is it that you not satisfied with? FUP5:With CAO?</p>

		<p>I: Hmm with the CAO, but base on your previous response I would take that you are satisfied. All: Yes I: Very? You concur All: Yes. I: I could pick up from the previous responses that problems are internal FUP2: Are you going to do for internal too??(laughter)</p>
<p>In terms for the value for money</p>		
<p>Data capturing error are costing the institution money FUP8</p>	<p>Financial Costs</p> <p>Mandatory fields</p>	<p>FUP8: for sure FUP2: for the applicant yes.</p> <p>FUP8: In terms of the institution the institution they do pay them for the applicant they have a percentage but the institution if you look at the challenges and the cost that goes in to data capture and errors report that goes to it. FUP8: We pay for all the data capture errors... Yes in terms of the applicant yes because we pay 100 to 600 for he can apply to any institution with a number of programmes in terms of data capture it costs the institution if they have their dugs in a row and try to minimize the errors of data capture yes it is a benefits to the institution. FUP7: Do you think the data captures is that bad? FUP8: Yes FUP7: Not a top student if doesn't know how to tick a box...</p>

		<p>FUP8:No their system does not have mandatory field</p> <p>FUP7:I am sure they do have mandatory fields <i>(arguing together)</i></p> <p>FUP8:Here I understand if you could have seen that reports downloaded from the CAO.</p> <p>FUP8:That can be fixed, if they make mandatory fields.</p>
<p>last question in terms of operation eh technology how does it affect or hinder the process I know that you mentioned that the students that are applying online things are not captured anything else?</p>		
<p>CAO is slow during FUP3 FUP5 FUP1 although participant FUP7 indicates that it is the university internal system</p>	<p>IT System</p>	<p>FUP3:It is slow.</p> <p>FUP5:The CAO system generally if everyone is using it very slowly putting the CAO number you can wait for 5 to 10 minute. You have to close and restart</p> <p>FUP7:Thats our problem not CAO, our bandwidth was not big enough.</p> <p>I:So you feel that it is slow when you try to extract data?</p> <p>FUP1:Yes it does that when we all using the system at the same time.</p> <p>I:Do you download?</p> <p>FUP1:Yes.</p>

Appendix 15. Ethical clearance letter



16 August 2018

Mrs Salamina Manoge Dzingwa (Segole) (9307232)
School of Management, IT & Governance
Westville Campus

Dear Ms Segole,

Protocol reference number: HSS/0841/015D

Project title: A case of the Centralised Applications System: Staff and student perceptions at Durban University of Technology and University of KwaZulu-Natal

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 15 August 2018 has now been approved as follows:

- Upgrade of Degree (from MADMIN to DADMIN)

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for period of 3 years from the date of original issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully

.....
Dr Shamila Naidoo (Deputy Chair)

/ms

cc Supervisor : Dr Fayth Ruffin
cc Academic Leader Research: Professor Isabel Martins
cc Administrator : Ms Angela Pearce

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

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