

**A Methodology to Institutionalise
User Experience in a
South African Provincial Government**

Marco Cobus Pretorius

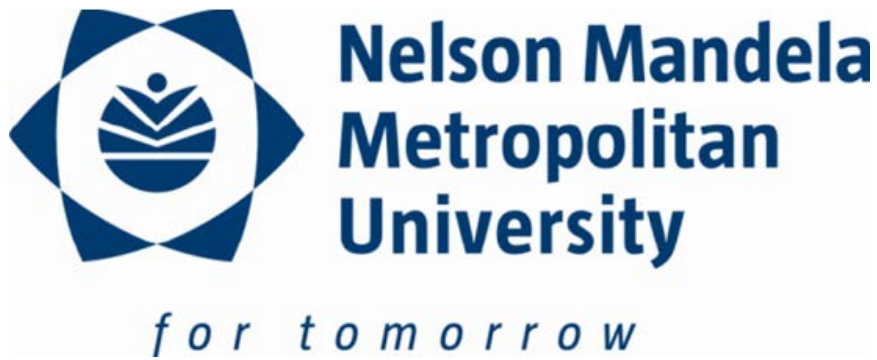
2012

In Loving Memory of my Beloved Sister

Dr Anje Pretorius

05 April 1981 – 09 June 2010

You are missed every day



Department of Computing Sciences

**A Methodology to Institutionalise User Experience in a South
African Provincial Government**

PhD

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Summary

The number of citizens, who access e-Government websites, is growing significantly and their expectations for additional services are increasing. The Internet has become an essential instrument to distribute information to citizens. Poorly designed websites, however, can divide governments and its citizens. Consensus amongst researchers is that user experience (UX) is an important factor in designing websites specifically e-Government websites. Problems, experienced with website usability, prevent people from accessing and eventually adopting technology, such as e-Government.

Countries, such as the United States, United Kingdom and Canada, have shown increased support for UX in e-Government websites. At present, a number of guidelines and design principles exists for e-Government website UX design; however, the effectiveness of the implementation of these guidelines and principles depends on the profiles of the individuals on a website development team and on an organisation's understanding of UX. Despite the highlighted importance of UX, guidelines and principles are rarely adopted in South African e-Government websites. Usability and UX guidelines cannot be implemented; if there is no executive support; an inadequately trained staff; no routine UX practice; insufficient budget; inefficient use of usability methodologies and user-centred design (UCD) processes. The challenge at present in the UX design field is the institutionalisation of UX, specifically at government level.

The goal of this research was to propose and evaluate a methodology to institutionalise UX in South African Provincial Governments (PGs), named the "*Institutionalise UX in Government (IUXG) methodology*". The research used the Western Cape Government (WCG) in South Africa as a case study to evaluate the proposed methodology to institutionalise UX in a South African PG. The IUXG methodology (1.0) was proposed from five UX methodologies, as well as from best practices found in literature. The IUXG methodology (1.1) was updated, based on results of a survey to South African PGs, a survey to WCG employees, as well as literature from the WCG. The IUXG methodology (2.0) was updated a final time, based on the case study results and on a confirmation survey with WCG employees after the implementation of the case study.

The research study made use of three surveys during this research. The first survey, incorporating UX maturity models, confirmed that understanding and buy-in of UX are limited and that UX maturity levels are low at South African PG level. The second and third surveys were administered

to WCG e-Government website officials before and after the implementation of the IUXG methodology. The surveys measured the UX maturity level of the WCG in the component, e-Government for Citizens (e-G4C), responsible for the WCG e-Government website. The final survey results demonstrated that, after the implementation of the IUXG methodology, the WCG improved its level of UX maturity on the identified UX maturity models.

Implementation of the IUXG methodology institutionalised UX in the WCG. UX activities became standard practice in the e-Government website environment after the systems development lifecycle (SDLC) incorporated UCD. UX policy, strategy and guidelines were documented for the WCG e-Government website. The WCG constructed the first usability testing facility for a South African PG and improvements to the WCG e-Government website were implemented. The proposed IUXG methodology institutionalised UX in the WCG e-Government website environment.

This research is a major contribution, to addressing the current lack of UX practices in South African PGs. South African PGs can use the proposed IUXG methodology to institutionalise UX and it will assist PG officials to develop increased UX maturity levels. The advantage of the IUXG methodology is that it provides PG officials with a step-by-step method how to institutionalise UX in a PG by following the six phases of the IUXG methodology: startup, setup, organisation, method, standards and long-term. The IUXG methodology will assist South African PGs to establish UX practice as a norm. The IUXG methodology will assist PGs with the resources, methods and tools to enable them to implement UX guidelines, which will result in an improved, more usable and more user-centric PG e-Government website.

Keywords: User experience; Usability; e-Government; Provincial Government; User experience maturity.

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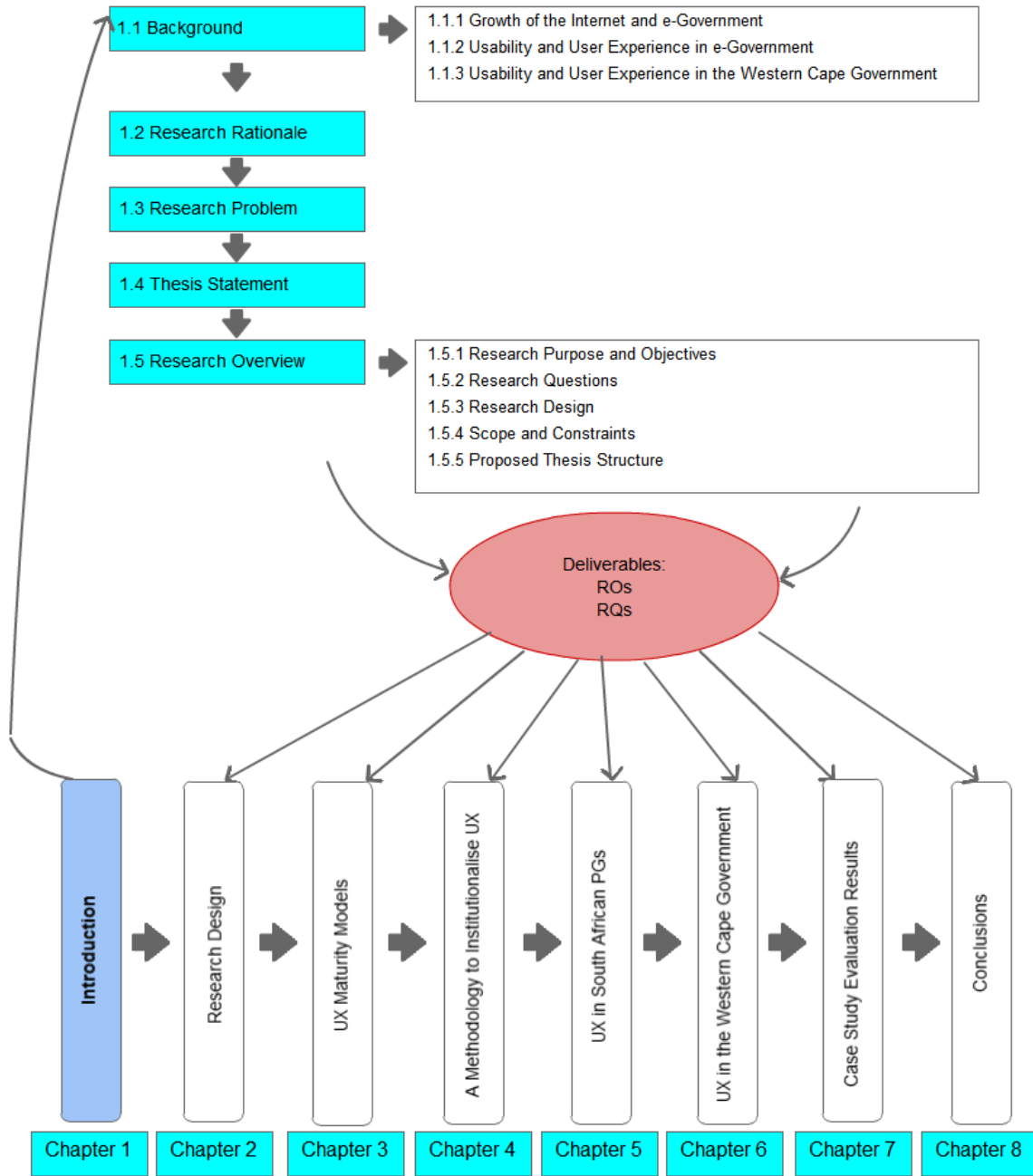
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List of Acronyms and Abbreviations

Acronyms and Abbreviations	Terms in full
CCD	Customer-centred design
CMS	Content Management System
CRM	Customer Relationship Management
CUA	Certified Usability Analyst
CUE	Consistent User Experience
CXA	Certified User Experience Analyst
e-G4C	E-Government for Citizens
e-Government	Electronic government
GCIS	Government Communication and Information System
HCD	Human-centred design
HFI	Human Factors International
ICT	Information and Communications Technology
IS	Information Systems
ISO	International Organisation for Standardisation
IUXG	Institutionalise UX in Government
NMMU	Nelson Mandela Metropolitan University
PET	Persuasion, Emotion and Trust
PG	Provincial Government
PSO12	Provincial Strategic Objective 12
ROI	Return on Investment
UCD	User-centred Design
US	United States
UTL	Usability Team Leader
UX	User Experience
WCG	Western Cape Government

Chapter 1: Introduction



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 1: Introduction

1.1 Background

The growth in Africa's Internet and broadband sector has significantly increased in recent years (Sub-section 1.1.1) (World Wide Worx, 2010). The number of worldwide e-Government users is growing significantly and their expectations for more services are rising (Kuzma, 2010). The African e-Government sector has also shown substantial growth in recent years (Yeratziotis, 2008). The Internet has become a crucial tool to disseminate information to citizens, but poorly designed websites can drive a wedge between a government and its citizens (Bailey, 2002). The importance of usability evaluation for government websites, in particular, has increased over the past few years (Al-Khalifa, 2010). The poor usability of government websites is problematic in several countries (Sub-section 1.1.2) (Wangpipatwong, Chutimaskul and Papasratorn, 2008).

Consensus amongst researchers is that usability is an important factor in designing e-Government websites. There is, however, some disagreement about the extent that usability has been achieved in the majority of e-Government websites (Berman, Angula, Khan and Madisha, 2010). African e-Government websites, including South African websites generally have higher failure rates and usability problems (Chango, 2007). Designing a user-friendly and functional provincial government website is a challenging task (Straub and Gerrol, 2008). A website that is difficult to navigate and does not meet the user's needs and requirements increases frustration of the user and the difficulty and complexity of successful completion of a task.

Internationally, countries such as the United States, United Kingdom and Canada have shown tremendous support for usability in e-Government (Horrigan, 2004; Kumar, Mukerji, Butt and Persaud, 2007; Soufi and Maguire, 2007). Today, in South Africa, a number of guidelines and principles exist for e-Government website design (Korsten and Bothma, 2005; Bernardo, 2005; Yeratziotis, 2008); however, there are indications that these principles and guidelines are not being applied by South African Provincial Government (PG) website designers. The lack of user-centred design (UCD) methodologies in government is a major obstacle in several countries (Wangpipatwong, Chutimaskul and Papasratorn, 2008). The application of UCD is crucial to ensure effective usability and user experience (UX). Further, usability and UX guidelines cannot be implemented if there is no executive support; inadequately trained staff; insufficient budget or inefficient use of usability methodologies and UCD processes.

At present, a major focus of the UX design field is to achieve UX maturity (Schaffer, 2012). The challenge at present in the UX design field is the institutionalisation of usability and UX (Schaffer, 2012). Organisations typically progress through a sequence of stages as their usability processes evolve and mature (Nielsen, 2006). Usability maturity models allow the assessment of the degree of capability reached by an organisation in its ability to perform human-centred design activities (Earthy, 1999). Institutionalising usability and UX in an enterprise demands the establishment of routine practice; the use of best practices and the supply to people of tools, methods and resources. Inclusion of internal and external personnel is essential (Israelski, 2004; Schaffer, 2004).

The Western Cape Government (a PG in South Africa) website was an advanced, government website, but it is no longer as effective due to several reasons. Governance processes are not clearly defined nor is there clarity of ownership (Sub-section 1.1.3) (Blessing and NtombovKlass, 2009). The goal of this study (Section 1.4) is to use the Western Cape Government as a case study in order to design a methodology to institutionalise UX in South African PGs.

1.1.1 Growth of the Internet and e-Government

The Internet has had a transformational effect on society. It has opened a new medium of communication for individuals and businesses and has provided opportunities to communicate and obtain information in an entirely different way (Kumar, et al., 2007). Growth in Africa's Internet and Broadband sector has accelerated in recent years due to improvements in infrastructure, the arrival of wireless access technologies and lower tariffs (Lange, 2011; World Wide Worx, 2010). Broadband is rapidly replacing dial-up as the preferred access method. More Internet providers exist offering Internet packages at low and competitive rates.

The number of South African Internet users grew from 6.8-million in 2010 to 8.5-million at the end of 2011 (SouthAfrica.Info, 2012). The number of South African Internet users doubled between the years 2005 and 2010 (Goldstuck, 2009). The number of Internet users in South Africa accelerated dramatically in 2011 and 2012, driven by both smartphones and ordinary mobile phones, as the Internet has become more available to the mass market (SouthAfrica.Info, 2012). The cellular habits of South African phone users have evolved dramatically in the past year as smartphones, mobile applications and the mobile Internet entered the mainstream (World Wide Worx, 2011). World Wide Worx now forecasts that this strong growth should continue during 2012, taking South Africa's Internet user base past the 10-million mark by the end of the year (SouthAfrica.Info, 2012).

These statistics show that more and more South Africans have access to the Internet and hence access to services such as e-Commerce and e-Government.

The increase in Internet connectivity is refining relationships between citizens and governments (INSEAD, 2012). The Internet plays an influential role in the public sector and can be used as a critical tool by government in the form of e-Government (Yeratziotis, 2008). E-Government, also known as digital or online government, is the use of Information and Communications Technology (ICT) to provide more efficient government services, empower citizens through access to information and facilitate communication between government and the community (Chango, 2007). Governments, worldwide, have been making significant attempts to make their services and information available on the Internet (Kumar et al., 2007). E-Government initiatives are being adopted by a number of countries in an attempt to improve relations within government itself and with citizens and businesses. This will assist in the rendering of improved service delivery and will further empower citizens to participate in the governance of the country itself (Yeratziotis, 2008).

Government systems have the largest potential user base of any technology (Buie and Murray, 2012). The increase in the use of e-Government services at a global level suggests that the public perceives the Internet as an acceptable means of becoming involved in government activity at both national and local government levels (AMEinfo.com, 2007). The number of visits to government websites will continue to grow in the future (Usability.gov, 2012a). More user visits mean more work, questions, e-mails, complaints and phone calls. A website that is not easy to learn, use, or one that does not match user needs makes communication needlessly difficult. The Internet has become a crucial, but ineffective, tool to disseminate information to citizens and poor websites can even drive a wedge between government and citizens (Bailey, 2002).

In the United States, the federal government is the largest single producer, collector, consumer and disseminator of information (Colvin, 2011; Usability.gov, 2012a). An increasing number of citizens is reaching out to government to find information and services to improve their daily lives (Usability.gov, 2012a). The July 2010 survey by the Pew Internet and American Life Project shows that 82% of American Internet users took advantage of e-Government in 2010, by visiting a government website to obtain information or to complete a transaction (Smith, 2010). The United Kingdom has experienced increased development in the provision of electronic service delivery of both national and local government services (Soufi and Maguire, 2007). The Canadian Government

has received a magnificent accolade for its e-Government strategy and is considered a world leader in e-Government initiatives (Kumar et al., 2007).

The potential use of e-Government is further increased with an increase in mobile Internet browsing. Mobile technology will become an affordable tool to bridge the digital gap between developed and developing countries, given the rapid price decline of mobile products (United Nations, 2010). Developing countries are adopting the use of mobile technology at an increased rate, which will trigger the need to develop additional mobile e-Government services (United Nations, 2010).

The rise of social media sites, such as Facebook, Twitter and YouTube has brought significant changes and has provided opportunities for governments (Kuzma, 2010). These tools have changed the ways Internet users communicate with each other and their governments and allow for greater social participation. The era of e-Government has changed the way government interacts with citizens (Renaud, 2012). The use of online government has increased; however, significant differences exist between countries. This may be due to awareness of services, perceptions of safety, relevance of the site to users and access to the Internet, among other reasons (AMEinfo.com, 2007).

The South African Government has recognised the potential benefits to be gained from harnessing the power of ICT (Bridges.org, 2003). The South African Government has committed itself to provide information to all sectors of the population (Korsten and Bothma, 2005). The former President of South Africa, Thabo Mbeki, during his presidential term explicitly supported the development of e-Government as well as the wide adoption of ICT in the country (Provincial Government of the Western Cape, 2001).

E-Government aims to improve the lives of citizens and make government agencies more efficient and accessible. It is well known, however, that most e-Government systems fail to achieve this goal (Berman et al., 2010). In Africa, e-Government projects, in general, have a higher rate of failure than success (Chango, 2007). A visit to a South African government website can be a frustrating experience (Vermeulen, 2010). The implementation of usability and UX guidelines can help to improve the user experience.

1.1.2 Usability and User Experience in e-Government

In 1994, usability was described as a process concerned with gathering data about the usability of a design or product by a specific group of users for a particular activity within a specified group of users or work context (Preece, Rogers, Sharp, Benyon, Holland and Carey, 1994). In 2007 this description was expanded to include the *user experience* by stating that usability included both the usability of the system, e.g. how effective, efficient, safe and learnable it is as well as the user's experience when interacting with the system, e.g. how satisfying, enjoyable or motivating the interaction is (Preece, Rogers and Sharp, 2007).

User experience (UX) takes a broader view, by looking at the individual's entire interaction with a system, as well as the thoughts, feelings and perceptions that result from the interaction (Tullis and Albert, 2008). UX is more dynamic, subjective and context-dependent than pure usability and depends on the user's accumulated experiences of the system over a longer time period than a single usability evaluation (Renaud, 2012).

Governments around the world are leveraging advances in Information and Communications Technology (ICT) to enhance their service delivery mechanism and to improve citizen interaction and satisfaction towards government (Berman et al., 2010). It has become obvious that usability will be critical to the development, deployment and understanding of digital government systems for citizens, policymakers, legislators and other stakeholders (Buie and Murray, 2012). Poor usability is a major obstacle in several countries (Wangpipatwong, Chutimaskul and Papisratom, 2008). The involvement of government institutions in UX varies widely, reflected in the different levels of usability present or complete lack of attention to UX, in government systems around the world (Downey and Rosales, 2012).

Problems with website accessibility and usability prevent people from accessing and eventually adopting technology such as the Internet and e-Government (Pilling and Boeltzig, 2007). The consensus among researchers is that usability is an important factor in designing e-Government websites. There is, however, some dispute about the extent that usability has been achieved in the majority of e-Government systems (Berman et al., 2010). While it has been said that "*Great strides have been made regarding e-Government site usability*" (Becker, 2003: 1), others argue that "*in terms of user friendliness, many applications are far off from being satisfactory*" (Traunmüller and Leitner, 2008: 6).

Straub and Gerrol (2008: 2) indicate that *“Putting government online is one thing; making government websites functional and easy to use is quite another”*. A government website should be designed from the public’s point of view (Eggers, 2005). Governments, generally, are seen to be behind the Web technology curve (Straub and Gerrol, 2008). Users interacting with government websites often experience that not enough has been done to anticipate their needs or make information easily available and locatable (Straub and Gerrol, 2008). The user experience with governmental websites does not compare well with the online experiences that citizens have in the private sector.

Citizens’ higher perception of the usefulness and ease of use of e-Government websites directly enhanced the level of intention of citizens to continue to use e-Government websites (Wangpipatwong, Chutimaskul and Papasratorn, 2008). One of the reasons for the lack of success of e-Government is that systems tend to focus primarily on technical aspects and less on the users’ needs (Xiong, 2006). Since government agencies have a large presence in citizens' daily lives, it is essential that government agencies not only involve citizens in developing websites, but also that they measure and report how a website is meeting users' needs (Usability.gov, 2012a).

In the United States, the importance of usability in government has grown and is considered a best practice (Usability.gov, 2012a). Korsten and Bothma (2005) compiled a South African government website audit where the findings demonstrated that there was a need for government websites to improve considerably with regard to content, information architecture, navigation, search and design. Scientific usability engineering practices were, continually, not followed during the development of South African Government websites (Korsten and Bothma, 2005). The South African Government did not have any direct policies or guidelines in relation to Web publishing at the time government websites were developed (Korsten and Bothma, 2005). Usability is not yet a best practice for South African government websites.

Individual local authorities do not necessarily have the experience or infrastructure to develop websites that are usable and that can be maintained as content changes (Soufi and Maguire, 2007). Usability guidelines for e-Government websites exist (Berman et al., 2010; Yeratziotis, 2008); there are, however, indicators that South African PGs have not applied these guidelines fully on existing websites. A possible problem is the lack of understanding and buy-in of usability at various levels of Government.

A number of UX methods, tools and guidelines exist that can guide developers and designers in creating e-Government solutions (Schaffer, 2004; Yeratziotis, 2008; Unger and Chandler, 2009; Asiiimwe and Lim, 2010; AlFawwaz, 2011; Howto.gov, 2011b; Usability.gov, 2012c); however, their effectiveness depends enormously on the profiles of the individuals on a team and on an organisation's understanding of UX (Jorge, 2012). UX professionals are typically thrown alone into a large organisation and left unsupported (Schaffer, 2004).

The challenge at present in the UX field is the institutionalisation of UX (Schaffer, 2012). Institutionalisation of UX is a must if an organisation needs to move from an ad hoc user-centred design (UCD) approach to a sustained and managed UX practice (Human Factors International, 2012a). Institutionalising usability provides tools, methods and resources, which include internal and external personnel (Israelski, 2004). In order to institutionalise UX, it needs to be made a routine practice within an enterprise. In order to find out if usability and UX are institutionalised in South African PGs, maturity models (Nielsen, 2006; Schaffer, 2004; Feijo, 2010) will be used to analyse the current state of UX practices.

Methodologies to institutionalise UX (ranging in detail) exist (Schaffer, 2004; ISO TR 18529, 2000; Unger and Chandler, 2009; Stagers, Rodney, Alafaireet, Backman, Bochinski, Schumacher and Xiao, 2011; Usability.gov, 2012c); however, these UX methodologies are not aimed specifically at South African Provincial Governments. The goal of this research is to provide a methodology how to institutionalise UX in a South African PG. The focus of this study will be on the Western Cape Government.

1.1.3 Usability and User Experience in the Western Cape Government

The Western Cape Government (WCG) supported the former President, Thabo Mkeki's drive for e-Government by launching an Internet portal, www.capegateway.gov.za. The Western Cape government established the Cape Gateway portal project in 2001 as part of the Cape Online Programme (Levin and Dingley, 2003). The portal (Figure 1.1) was launched in March 2004 (Vosloo, 2004). In 2011, the portal identity was changed to www.westerncape.gov.za.



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Cape Gateway is a government service aimed primarily at citizens of the Western Cape, providing information on local, provincial and national government

Figure 1.1: Western Cape Government Homepage at the Start of this Study

Source: www.capegateway.gov.za, January 2010.

The portal is a single point of access to government information and services for the citizens of the Western Cape (Cape Gateway, 2011). The portal offers transparency by providing information about all government departments and services (Levin and Dingley, 2003). The WCG portal provides information such as WCG services, departments, news, tenders, jobs, documents and contacts. Although the focus is on the WCG, it also provides selected national and municipal (e.g. City of Cape Town) information.

The portal is managed by a Directorate in the WCG, named e-Government for Citizens (e-G4C). E-G4C offers various channels to access government information:

- Websites (Internet and Intranet);

- Contact centre (call centre, e-mail, walk-in centre and Presidential hotline);
- Cape Access (provides access to ICT to poor and rural communities across the Western Cape).

The portal was an advanced government website (2004-2005), but has become less effective due to lack of ownership, lack of funding and investment, lack of clearly defined governance process, lack of long-term e-service strategy and little or no cross-agency coordination and collaboration (Blessing and NtombovKlass, 2009; Western Cape Government, 2012d). The reasons listed above caused the UX of the website to deteriorate. The state of UX in the WCG is examined in Chapter 6. The e-G4C Directorate in the WCG will be used as the case study to institutionalise usability in a PG. The aim of this study when completed will be to make this methodology available to other South African PGs.

1.2 Research Rationale

The increase in availability of Internet and broadband in Africa is increasing the use of e-Government services (Sub-section 1.1.1). Several studies have highlighted the importance of usability in e-Government (Bernado, 2005; Korsten and Bothma, 2005; Yeratziotis, 2008). Many of these studies have listed guidelines that e-Government websites should satisfy in order for them to be usable. Despite the highlighted importance of usability and the usability guidelines and standards, usability and UX is rarely adopted in South African e-Government websites (Sub-section 1.1.2; Section 1.3).

This prompts the need to determine the UX maturity (Chapter 3) of South African PGs (Chapter 5). An investigation is needed on how to make UX more mature in an organisation: how to institutionalise UX in an organisation (Chapter 4). A South African PG needs to be selected as a case study (Sub-section 1.1.3; Chapter 6) in order to design and implement a methodology to institutionalise UX in a South African PG (Chapter 6). The results of the case study (Chapter 7) will inform an updated proposed methodology to institutionalise UX in a South African PG (Section 1.4; Chapter 8). The recommendations of this study have implications for government officials, information technologists, website designers, usability evaluators and e-Government website designers.

1.3 Research Problem

The problem researched in this study is based on the realisation that South African PG websites do not appear to implement usability and UX guidelines. A misalignment exists between the number of usability and UX guidelines that exist and the implementation thereof. Several studies have researched guidelines for South African Government websites (Yeratziotis, 2008), the architectures of South African Government sites (Bernado, 2005) and evaluation and methods for evaluating of South African Government websites (Korsten and Bothma, 2005).

Despite the highlighted importance of usability and the usability guidelines and standards, usability is rarely adopted in South African PG websites. The importance of e-Government in South Africa has been communicated by the South African Government; however, the problem is that there are no clear mandates on usability and how to achieve it in South African National, Provincial or Local Government websites.

The need for this research is based on the premise that UX processes are not mature and institutionalised in South African PGs (discussed in Chapter 5). The importance of usability in government has grown and is considered a best practice in countries such as the United States (Usability.gov, 2012a). Usability and UX do not appear to be a best practice or a standard in the South African government. Although there is a substantial body of usability and UX knowledge, the information is generally only practised by specialists in the field. There is a lack of understanding and buy-in of usability at PG level. This study will provide a methodology on how to institutionalise UX in a South African PG. If PGs implement this methodology, their organisation will be more user-centric, they will be able to focus on the user experience and they will be able to implement existing usability and UX guidelines.

Previous South African Government studies did not investigate the institutionalisation of UX, such as UX awareness, buy-in, user-centred design methods, staff, etc. Further, most previous studies focused on the National Government and specifically the www.gov.za website. This study will focus on a provincial (regional) government level. Finally, the case study is actually applied in a live government environment; the results reported here will be the results from a real-world environment.

1.4 Thesis Statement

UX practitioners in South African PGs will be provided with a methodology on how to institutionalise UX in a South African PG. The definition of “*institutionalisation*” used in this study is as follows:

- The process of establishing a practice as a norm (Wiktionary, 2012).

The focus of this study will be on the process of establishing UX practices as a norm in South African PGs. Existing methods and techniques used in previous research and in organisations will be investigated. A proposed methodology will be recommended and applied in a case study on the Western Cape Government (previously known as the Provincial Government of the Western Cape). The results will be analysed and an improved methodology will be recommended. Based on this description, the following thesis statement is proposed:

A methodology for institutionalising UX in a South African Provincial Government can enhance the UX maturity of a Provincial Government.

1.5 Research Overview

The goal of this section is to discuss the purpose and objectives of this study as well as the research questions and the methodology that will be used to address the objectives and research questions. A proposed thesis structure will also be provided.

1.5.1 Research Purpose and Objectives

The purpose of this research is to propose and evaluate a methodology that will support the institutionalisation of UX in a South African PG, named the “*Institutionalise UX in Government (IUXG) methodology*”. The usefulness and usability of the methodology will be determined by applying the methodology in a case study focusing on the Western Cape (Provincial) Government.

Following this purpose the following objectives have to be realised:

- **Primary Research Objective:**

RO_M: To propose and evaluate a methodology for institutionalising UX in a South African Provincial Government (IUXG 2.0).

- **Secondary Research Objectives (ROs):**

RO1: Recommend UX maturity model(s).

RO2: Propose a methodology for the institutionalisation of UX (IUXG 1.0).

RO3: Evaluate the maturity model level of UX in South African Provincial Governments.

RO4a: Re-evaluate the maturity model level of UX in the Western Cape Government.

RO4b: Propose an updated methodology to institutionalise UX in a South African Provincial Government (IUXG 1.1).

RO5: Evaluate the Institutionalise UX in Government methodology (IUXG 1.1) using the Western Cape Government as a case study.

1.5.2 Research Questions

Based on the purpose of the research and the research objectives, the main research question can be phrased as:

RQ_m: ‘Can a methodology be proposed and evaluated to institutionalise UX in a South African Provincial Government (IUXG 2.0)?’

The main research question (RQ) is linked to RQ5 below.

The secondary research questions of this study are as follows:

RQ1: What UX maturity model(s) can be identified from literature?

RQ2a: What current UX methodologies can be identified from literature?

RQ2b: What integrated methodology can be proposed to institutionalise UX (IUXG 1.0)?

RQ3: What is the maturity model level of UX in South African Provincial Governments?

RQ4a: What is the current maturity model level of UX in the Western Cape Government?

RQ4b: What updated methodology should be proposed to institutionalise UX in a South African Provincial Government (IUXG 1.1)?

RQ5: Does the IUXG methodology (IUXG 1.1) institutionalise UX in the Western Cape Government?

The research objectives and questions are linked together with the deliverable of each chapter in Chapter 2, the research design. Figure 1.3, the thesis structure, maps the ROs and RQs to the chapters of this study.

1.5.3 Research Design

A research design is the general plan of how a researcher can attempt to answer the research questions (Saunders, Lewis and Thornhill, 2009). Figure 1.2 (Saunders, Lewis and Thornhill, 2009) is a diagram illustrating a generic research process “onion” showing the relationship between the various aspects of the research process. Chapter 2 will discuss the research design of this study in detail.

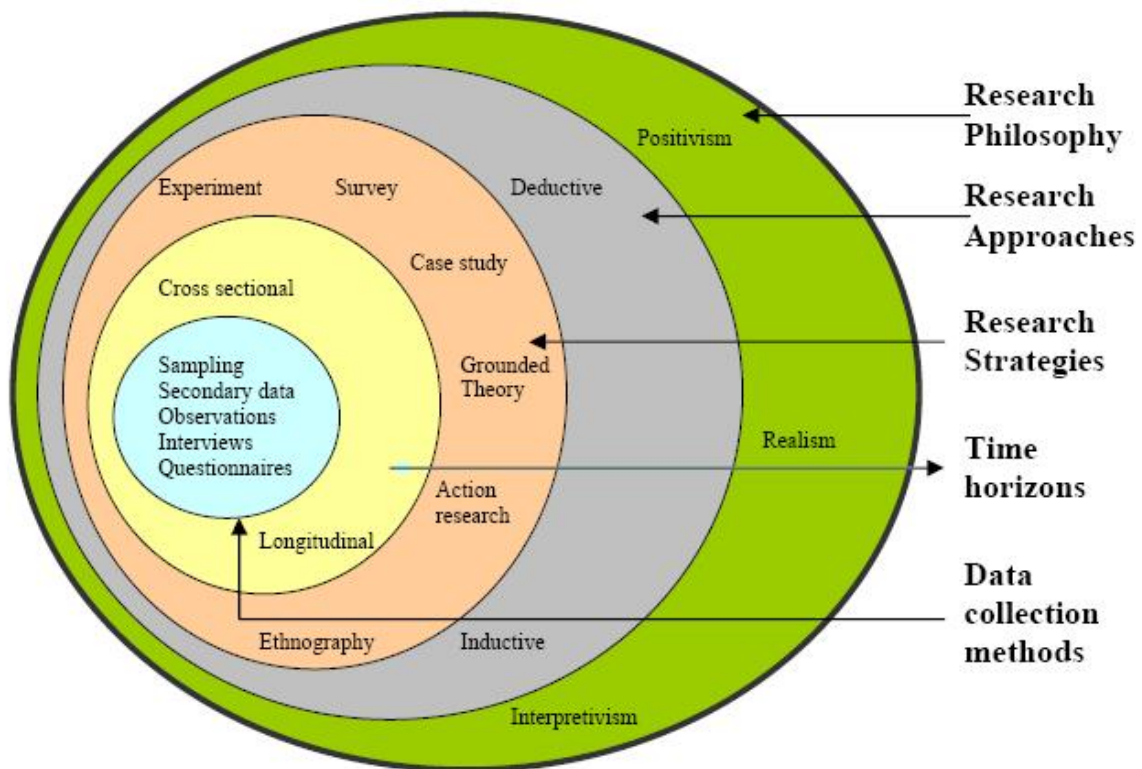


Figure 1.2: The Research Onion Process

Source: Saunders, Lewis and Thornhill, 2009: 108.

A case study approach is followed in this study. A case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence (Saunders, Lewis and Thornhill, 2009). The research design and case study approach is discussed in greater detail in Chapter 2.

1.5.4 Scope and Constraints

The methodology used in this study will be limited to one South African PG, namely the Western Cape Government. The focus will be on the methodology to institutionalise UX in a South African PG; the focus will not be on the individual UX methods, for example how to conduct a usability lab

study. References to these methods will be given in order for the readers to know where to find more information about the particular methods.

1.5.5 Proposed Thesis Structure

Figure 1.3 illustrates the proposed structure of this thesis together with the matching ROs and RQs.

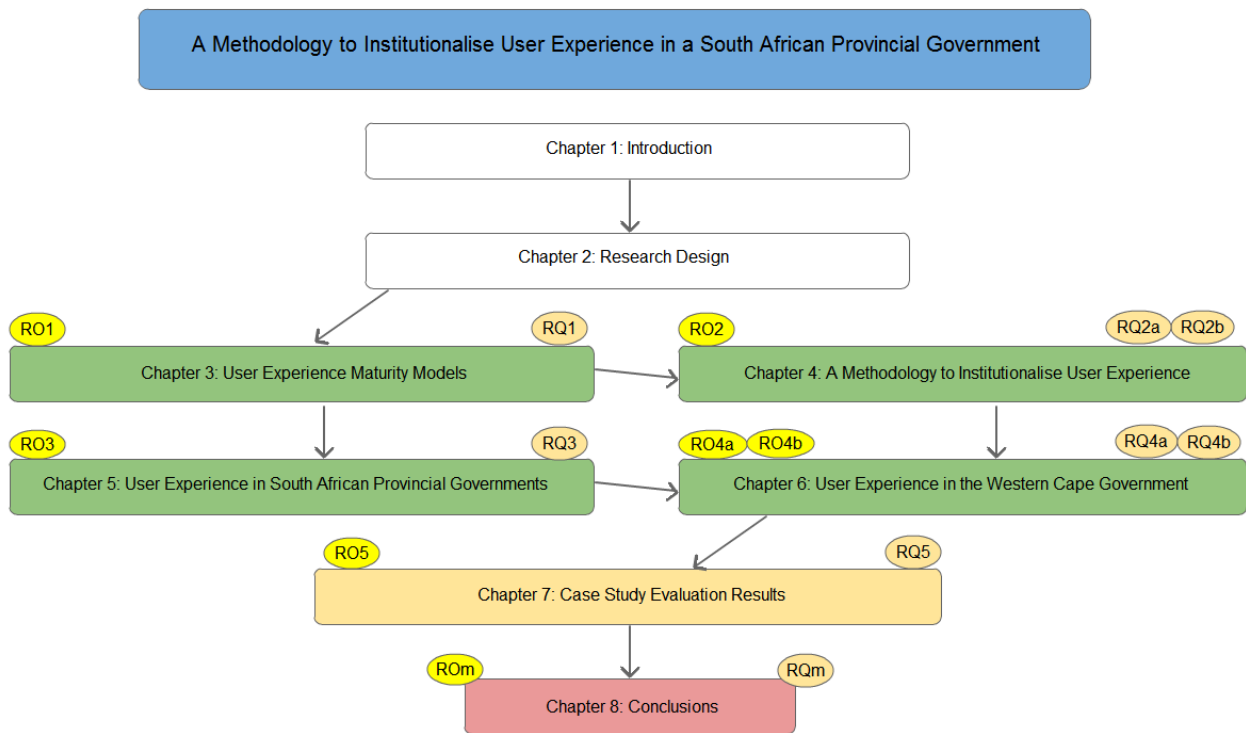


Figure 1.3: Thesis Structure

The following chapters are included in this thesis:

Chapter 1: Introduction

This is an introduction to the research study.

Chapter 2: Research Design

This chapter presents the research design that will be used to answer the research questions and achieve the research objectives of this research study. The different research methods are also discussed.

Chapter 3: User Experience Maturity Models

The focus of this chapter will be to introduce and define usability and UX and to investigate UX maturity models. The deliverable of this chapter is UX maturity models that can be used to evaluate the UX maturity of PGs in South Africa.

Chapter 4: A Methodology to Institutionalise User Experience

The focus of this chapter will be a discussion of methodologies and methods for institutionalising UX. Different UX methodologies and methods will be investigated. The deliverable of this chapter is a proposed methodology to institutionalise UX (IUXG 1.0).

Chapter 5: User Experience in South African Provincial Governments

This chapter will investigate e-Government, government on the Internet and government websites (internationally and in South Africa). Usability and UX in government is discussed. A survey is conducted with South African PGs to determine their UX maturity. The deliverable of this chapter is the UX maturity results of the South African PGs.

Chapter 6: User Experience in the Western Cape Government

The focus of this chapter is on the WCG as the case study for this research. The UX maturity of the Western Cape Government is examined through a follow-up survey with WCG officials working closely with the WCG website. The first deliverable of this chapter is the results of the follow-up survey. Based on these results, the methodology to institutionalise UX will be updated and generalised for government usage (IUXG 1.1). This updated methodology is the second deliverable of this chapter.

Chapter 7: Case Study Evaluation Results

This chapter will discuss the results of the proposed methodology to institutionalise UX in the WCG. The first deliverable of this chapter is the case study results. The second deliverable is a gap analysis for the WCG in order to list what still needs to be done to institutionalise UX in the WCG.

Chapter 8: Conclusions

The first goal of this chapter is to conduct a confirmation survey with WCG officials to measure if the UX maturity of the WCG improved after the implementation of the IUXG methodology. The second goal of this chapter is to update the IUXG methodology based on the results of the case study. The final deliverable of this research is the IUXG (2.0) methodology. This chapter presents a

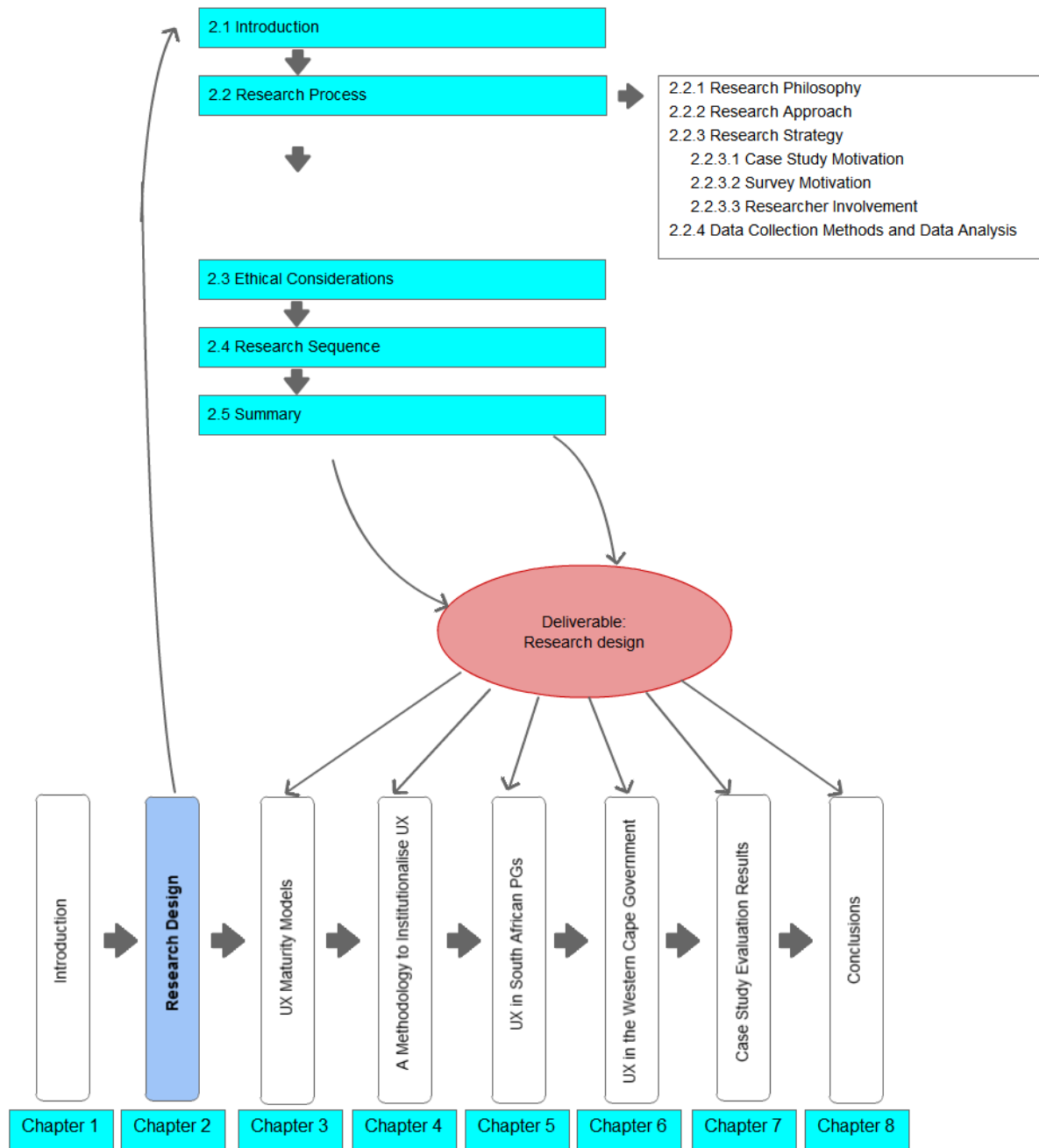
summary of the research results and draws conclusions from the findings of the research. The research objectives are revisited and discussed and future research opportunities identified.

Figure 1.4 illustrates the keywords of this research. The methods that will be used to answer the research questions (Sub-section 1.5.3) and the reasons for selecting these methods will be presented in the next chapter.



Figure 1.4: Word Cloud of Keywords of this Research Study

Chapter 2: Research Design



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 2: Research Design

2.1 Introduction

A research design is used to describe the motivation and the procedures for conducting a research study and its purpose is to find appropriate answers to research questions. A research design is the general plan of how a researcher can go about answering the research questions (Saunders, Lewis and Thornhill, 2009). The main research question of this study is: *Can a methodology be proposed and evaluated to institutionalise user experience (UX) in a South African Provincial Government (PG)?* The proposed methodology is referred to as the Institutionalise UX in Government (IUXG) methodology. This chapter presents the research design that will be used to achieve the research objectives and answer the research questions outlined in Chapter 1.

The research approach depends on a combination of interpretivism and positivism. A combination of the inductive and deductive research approach is used. A case study and survey strategy are used to collect and analyse data and address the aims of the study. Results collected in this research study are qualitative. This research utilises the Western Cape Government (WCG) as a case study in order to evaluate the proposed methodology to institutionalise UX in a South African PG.

This chapter discusses the research design by responding to the research questions outlined in Chapter 1 (Sub-section 1.5.2). The following section discusses the research process in line with the research onion process adapted from Saunders, Lewis and Thornhill (2009) (Section 2.2). The research philosophy (Sub-section 2.2.1), research approach (Sub-section 2.2.2), research strategies (Sub-section 2.2.3) and data collection method and analysis (Sub-section 2.2.4) are discussed. The research objectives, research questions and deliverables of this research are mapped together in Table 2.2. Ethical clearance was obtained for this research (Section 2.3). Section 2.4 motivates the research sequence of this research and Section 2.5 summarises the research design chapter.

2.2 Research Process

Figure 2.1 illustrates a generic research process “onion”, showing the relationship between the various aspects of the research process (Saunders, Lewis and Thornhill, 2009). The research process is used to define the research methodology and design of this study in detail. The research philosophy, approach, strategies and data collection method and analysis are discussed next.

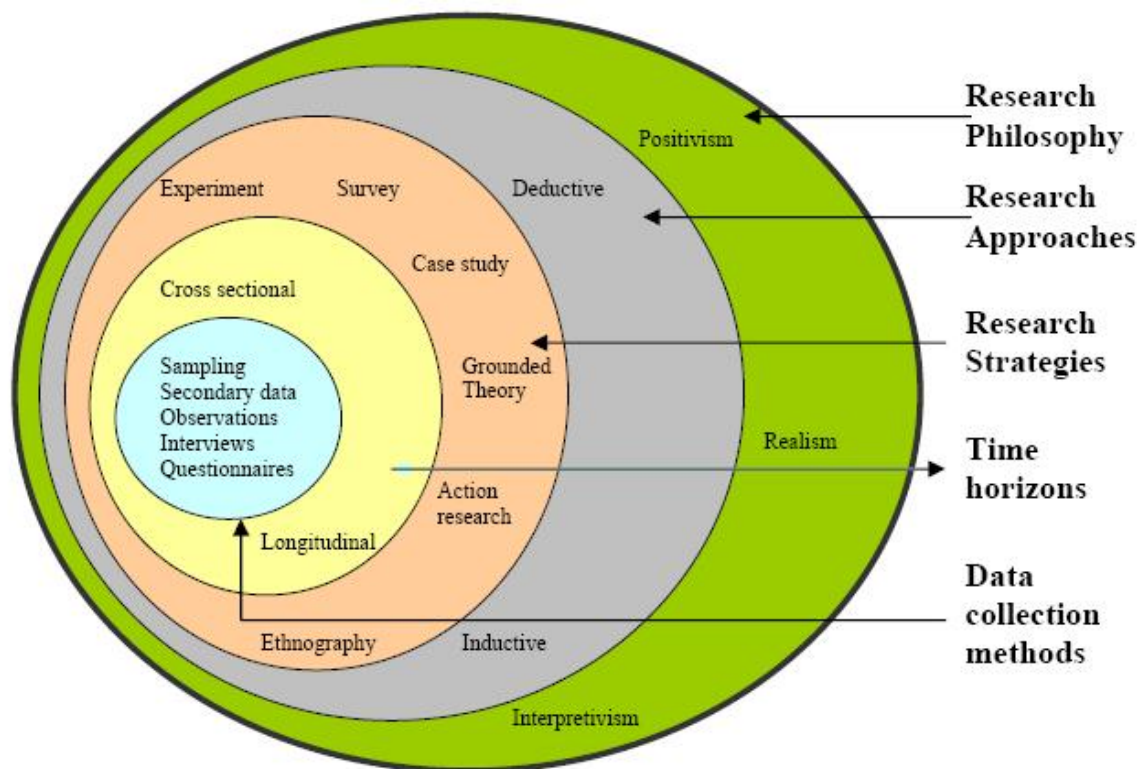


Figure 2.1: The Research Onion Process

Source: Saunders, Lewis and Thornhill, 2009: 108.

2.2.1 Research Philosophy

The first discussion point of the “onion” is research philosophy. Research philosophy refers to the development of knowledge and the nature of the knowledge developed (Oates, 2008; Saunders, Lewis and Thornhill, 2009). Research philosophy provides a researcher with, basic guidelines on how the research can be conducted by outlining beliefs about the way data, regarding a phenomenon, should be collected and analysed (Levin, 1988). Mertens (2004) discusses four main research paradigms:

- *Positivism*: Positivism is based on the belief that the social world can be studied in the same manner as the natural world. Positivists believe that one reality exists and it is the researcher’s task to discover that reality (Saunders, Lewis and Thornhill, 2009). Positivism is the most commonly used research philosophy in information systems (IS) research (Mingers, 2003; Oates, 2008). Positivists believe that research is reliable if results can be replicated;
- *Interpretivism*: Interpretivism advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. Interpretivists believe that reality

keeps on changing; things that are true today may not be true in the future or in another context (Oates, 2008). Therefore the meaning is usually interpreted by the subjective view of the researcher within a certain context and the researcher is part of what is being researched (Saunders, Lewis and Thornhill, 2009);

- *Realism*: Realism is another philosophical position which relates to scientific enquiry. The essence of realism is that what the senses show us as reality is the truth: that objects have an existence independent of the human mind. Realism is similar to positivism in that it assumes a scientific approach to the development of knowledge. The reality in the realism approach is considered to be stable, but hidden social factors have an influence on behaviour and it is the researchers' duty to expose the hidden factors. Generally, it can be stated that the realism view falls between approaches of positivism and interpretivism;
- *Pragmatism*: This involves multiple views according to the research question that is to be answered (Saunders, Lewis and Thornhill, 2009). The researcher can have both subjective and objective views of a phenomenon.

The purpose of interpretivist research is to acquire meaning and understanding within a certain context and the researcher is part of what is being researched (Saunders, Lewis and Thornhill, 2009; Kroeze, 2012). The research study is conducted in one South African PG in which the author of this research is employed. Positivists believe that one reality exists and it is the researcher's task to discover that reality (Saunders, Lewis and Thornhill, 2009). The focus of this research study is to deliver an IUXG methodology to institutionalise UX in any South African PG. Interpretivism, with elements of positivism, is used in this research. The next sub-section discusses the research approach.

2.2.2 Research Approach

Figure 2.1 (the research onion) referred to induction and deduction as research approaches. A research approach can be inductive, deductive or a combination of both. Induction is the creation of a theory, whereas deduction is the process of testing a theory (Saunders, Lewis and Thornhill, 2009). An inductive approach emphasises gaining an understanding of the meanings humans attach to events and thus gain a close understanding of the research context. The structure is more flexible to allow changes of research emphasis as the research progresses and has less concern with the need to generalise. When researching a topic that is new and where there is limited existing literature, it

is more appropriate, when working inductively, to generate data and analyse and reflect on what theoretical themes the data suggest.

Deduction involves the development of a theory that is subjected to a rigorous test. As such, it is the dominant research approach in the natural sciences where laws present the basis of explanation, allow the anticipation of phenomena, predict their occurrence and therefore permit them to be controlled (Collis and Hussey, 2003). Deduction emphasises moving from theory to data and is most suitable where there is a wealth of literature from which a theoretical framework and hypothesis can be defined.

It is often advantageous to combine both of these methods (Saunders, Lewis and Thornhill, 2009) and therefore, although this study will be mostly deductive, there will be some aspects that are inductive. The inductive approach will be used to design the IUXG methodology. A deductive approach will be used to address the main research question and to test the proposed IUXG methodology.

2.2.3 Research Strategy

Saunders, Lewis and Thornhill (2009) define a research strategy as a general plan of how you go about answering the research questions you have set. The choice of a good strategy will be driven by set objectives addressing the research questions. Possible data collection sources and research constraints are explored in the strategy. Two broad categories classify research strategies: qualitative and quantitative (Van der Merwe, Kotze and Cronje, 2005; Myers, 2010). Quantitative research focuses on numbers where variables are manipulated and natural phenomena are controlled (Leedy, 1993). In contrast, qualitative research focuses more on human beings. Qualitative research is the use of qualitative data, such as interviews, documents and participant observation data, to understand and explain social phenomena (Myers, 2010).

Qualitative and quantitative research methods are not mutually exclusive (De Villiers, 2005). Varieties of research benefits are derived from adopting mixed research method approaches as each research method has different assumptions and procedures and complement one another (Trauth and Jessup, 2000). This study will use two research strategies, including a case study and surveys. The survey data collection method is used as this is consistent with the case study methodology (Yin, 2003).

Figure 2.2 illustrates leading research methods situated on a positivist-interpretivist axis, tending from the quantitative to the qualitative, yet with an overlap (De Villiers, 2005). The research methods illustrated in Figure 2.2 demonstrate that case studies and surveys are interpretivist and qualitative methods. The main focus of this study will be on a case study and hence qualitative (Figure 2.2). The next sub-section motivates the case study selection. Surveys will be used to measure the usability and UX maturity model levels of PGs (motivated in Sub-section 2.2.3.2).

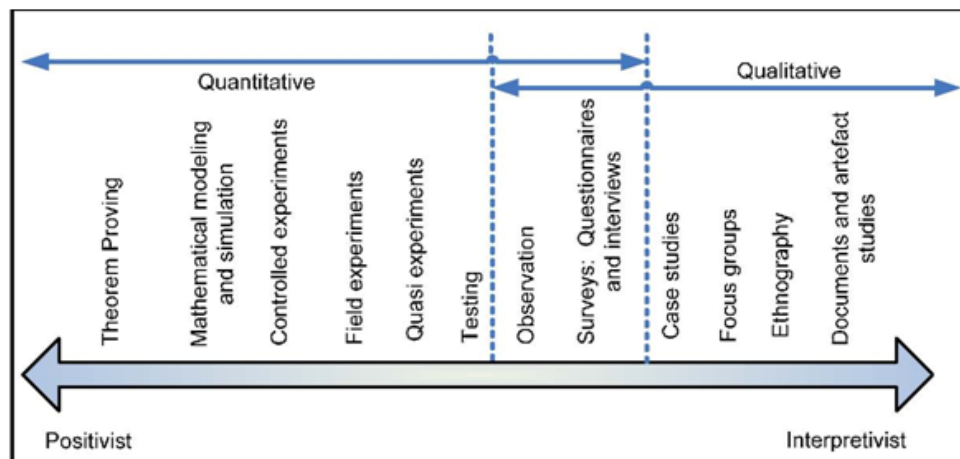


Figure 2.2: Research Methods and Strategies

Source: De Villiers, 2005: 143.

2.2.3.1 Case Study Motivation

A case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context by using multiple sources of evidence (Saunders, Lewis and Thornhill, 2009). Case study research is not only a data collection approach or design feature, but also a comprehensive research strategy (Yin, 2003). Case studies usually use a theoretical framework to guide both the collection from multiple sources of data and the analysis of data (Yin, 2003).

The case study strategy has considerable ability to generate answers to the questions “*Why*”, as well as the “*What*” and the “*How*” questions. Compared to other methods, the strength of the case study method is its ability to examine, in-depth, a *case* within its *real-life* context (Yin, 2006). The case study method helps to make direct observations and collect data in natural settings, compared to relying on derived data. The case study will be used to evaluate the proposed IUXG methodology and the Western Cape Government will form the basis of the case study.

The case study strategy is particularly well-suited to IS research as new technologies are continually introduced and interest has shifted to organisational rather than technical issues (Benbasat, Goldstein and Mead, 1987). The research of this study relates to usability, UX and e-Government, which fall into the broader field of IS.

Case studies can provide important feedback when a study is in the initial stages of understanding the problem and the merits of possible solutions (Benbasat, Goldstein and Mead, 1987). The institutionalisation of UX in PGs is in the initial stages in South Africa (Chapter 5). The use of a case study can provide meaningful feedback to PGs in South Africa and other emerging market governments. Case studies use analytical rather than statistical generalisation; that is they develop a theory which can help researchers to understand other similar cases or situations (Robson, 2002). A case study strategy could be used successfully in this study to answer the main research question (RQ_M).

There are four characteristics of case studies (Lazar, Feng and Hochheiser, 2010), namely:

- *In-depth investigation of a small number of cases:* Case studies use an in-depth, broad examination of a small number of cases in order to address a broad range of concerns. The WCG is used as the case study to examine the phases and steps of the proposed IUXG methodology;
- *Examination in context:* Case studies are useful when detailed knowledge of any particular case is required. The WCG is the South African PG context of the study;
- *Multiple data sources:* Case studies often rely on multiple data sources and collection techniques to act as sources of verifying evidence which can increase confidence in the data. The results of the case study will include input from WCG officials and contract workers, surveys (Sub-section 2.2.4) as well as results from WCG projects (Sub-section 2.2.4);
- *Emphasis on qualitative data analysis:* The results of this research study will be of a qualitative nature.

A case study is therefore particularly suited as the research strategy for this study. The risks and constraints of a case study are identified and resolved as follows (Hofstee, 2006; Lazar, Feng and Hochheiser, 2010):

- *The risk of losing focus:* A single case study will be explored, namely the WCG. The WCG has appointed appropriate staff with a mandate to manage the WCG e-Government website and will assist to keep focus on the research study;
- *Generalisability of results:* South Africa has nine PGs each with a mandate to have a PG website; therefore, the results of the research will be generalisable for use to all South African PGs;
- *Subjectivity:* In order to avoid subjectivity, official procedures and professional protocols are followed and results are documented to obtain the case study results of this study. Additionally, WCG officials are included as participants in the surveys and consulted in the case study results;
- *Time consuming:* This constraint consequently allowed for only a single case study to be explored.

Case studies can examine single or multiple cases (Saunders, Lewis and Thornhill, 2009). A single case may or may not be representative. In the case that it is not representative, multiple cases may provide increased confidence in the observed results. Single organisation and single technology studies are common in IS research (Amoako-Gyampah, 2004) and single case studies have been successfully used in human-computer interaction (Lazar, Feng and Hochheiser, 2010) and can provide analytic rather than statistical generalisations.

A single case study approach was used for this research and the case study selected is the WCG, a South African PG. Chapter 6 discusses the motivation for the selection of the WCG. The main reason for the selection of the WCG was that the author was employed at the WCG as the Usability Team Leader. Researcher involvement is discussed in Sub-section 2.2.3.3. The motivation for the survey strategy is discussed next.

2.2.3.2 Survey Motivation

Research strategies are not mutually exclusive (Saunders, Lewis and Thornhill, 2009) and could incorporate a survey strategy as part of a case study. The case study strategy is a difficult approach to use, especially on its own and is often combined with other techniques such as the survey strategy (Hofstee, 2006). Survey research had derived considerable credibility from its widespread acceptance and use in academic institutions as a research technique in professional disciplines (Rea and Parker, 2005).

The ultimate goal of survey research is to learn about a large population by surveying a sample of that population (Hofstee, 2006; Tustin, 2006). The survey strategy is usually associated with the deductive approach and is most often used to answer “*who*”, “*what*” and “*how many*” questions (Saunders, Lewis and Thornhill, 2009). The data is often collected by using a questionnaire administered to a sample of the population and then standardised, thus allowing easy comparison. Surveys are used in this research study to measure the UX maturity level of the WCG throughout this research. UX maturity models allow an organisation to measure its current UX maturity levels.

A survey data collection method is used as this is consistent with the case study methodology (Yin, 2003), has a low cost of administration, provides confidentiality and is a relatively easy way to administer and analyse data (Burns, 2002). The surveys used in this study are derived from literature (Chapter 3, Chapter 5 and Chapter 6) and include demographics, current UX maturity models as well as UX maturity questions from literature:

- *Demographic information.* The PG officials’ PG; Directorate; job title;
- *Schaffer’s (2004) maturity model;*
- *Nielsen’s (2006) maturity model;*
- *Feijo’s (2010) maturity model;*
- *UX generic questions.* The questions are based on UX maturity questions from literature, including Straub, Patel, Bublitz and Broch (2009), Human Factors International (2011) and Ide-Smith (2011b) (Chapter 5). The UX generic questions are regrouped and updated according to the proposed IUXG methodology (Chapter 6). The questions consist of open and closed ended questions.

Three surveys (discussed in Sub-section 2.2.4) are used in this research study consisting of the elements described above. The first survey is e-mailed to participants from the nine South African PGs. The second and third surveys are administered via interviews to WCG officials. The two approaches used to administer the surveys to participants are as follow:

- Surveys are e-mailed to participants from the nine South African PGs for the first survey. The mail-out format for collecting survey data (Rea and Parker, 2005) involves e-mailing the survey to potential respondents. Respondents are asked to complete the survey on their own and to return it by e-mail to the author of this research. The advantages of this technique with respondents spread across South Africa, is cost saving (Rea and Parker, 2005). Additionally, the respondents can complete the survey at their own convenience. A

disadvantage is the typical, lower response rate. Respondents from each South African PG agreed to participate;

- One-on-one interviews are conducted with WCG officials as the method to administer the surveys (second and third surveys). In-person surveys are structured to permit an interviewer to solicit information directly from a respondent in personal interviews (Rea and Parker, 2005). The survey is explained to participants and they have the opportunity to ask questions as required. The interviewer can probe for more detail, explain unclear questions and use visual aids, such as a print-out of the WCG e-Government website (Rea and Parker, 2005). A possible disadvantage of this technique is high costs; however, the author of this research is situated in the same building as the officials, thus saving travel costs and making interviews easy to organise.

Despite the broad-based acceptance of survey research, there remains a doubt concerning the reliability of information derived from a limited number of respondents purporting to represent the whole (Rea and Parker, 2005). This is considered in this research study.

The validity of a survey is influenced by the design of the questionnaire which includes the questionnaire items, the formulation, structuring and presentation of the items (Van Biljon, 2012). The surveys are derived from literature, using existing UX maturity models (Schaffer, 2004; Nielsen, 2006; Feijo, 2010) as well as UX generic questions derived from existing surveys and literature (Human Factors International, 2011; Ide-Smith, 2011b). The researcher's involvement in this study is discussed next.

2.2.3.3 Researcher Involvement

The researcher of a study is typically an “*outside researcher*” or an “*involved researcher*” (Walsham, 1995; Walsham, 2006). “*Outside researchers*” typically carry out studies using formal interviews without any involvement in the field (Walsham, 1995; Walsham, 2006). An “*involved researcher*” is seen as a participant observer or is involved in the field of activity (Walsham, 1995; Walsham, 2006). The researcher involvement in this study was that of an involved researcher. The researcher was the leader of the UX team at the WCG and it was his responsibility to institutionalise UX in the PG.

An advantage of an involved researcher is the in-depth access to people, issues and data (Walsham, 2006). An involved researcher has the opportunity to observe and participate at first hand, rather than merely accessing opinions as is the case in an interview-only study. The researcher, as the UX manager, had a mandate to institutionalise UX in the WCG to allow direct access to people, issues and data. Certain positive benefits can often be gained, because the field participants see the researcher attempting to make a valid contribution to the field site itself, rather than merely taking the data away and writing it up solely for the literature. There is a frequent call for IS researchers to make their work more relevant to practice (Baskerville and Myers, 2004; Walsham, 2006).

A disadvantage of involved research is that it is very time-consuming (Walsham, 2006). This constraint allowed for only a single case study to be explored (Sub-section 2.2.3.1). Close involvement may not be possible as an organisation may not allow it (Walsham, 2006). The WCG allowed close involvement and provided permission for the study and for the results to be published (Section 2.3) (Appendix B).

Close involvement may also cause participants to be less open and honest with the researcher in cases where he or she is perceived to have a vested interest. The potential problem is addressed as the author of this research is not in a position of power. The participants of the first survey included government officials from the nine South African PGs; the author has no position of power over these participants. Additionally, the WCG officials participating in the follow-up surveys consist of peers and a manager of the author. The WCG officials are also consulted in the case study results.

Additionally, a danger exists that the closely involved field researcher becomes socialised to the views of the people in the field and loses the benefit of a fresh outlook on the situation (Walsham, 2006). This potential problem is avoided by documenting the case study results through official procedures and professional protocols in the WCG. Data collection methods and analysis are described next.

2.2.4 Data Collection Methods and Data Analysis

A case study and surveys are employed in this research to collect qualitative data (explained in Sub-section 2.2.3). This research distinguishes between primary and secondary sources of data (Tustin, 2006). Primary data is data that is unpublished and has been collected directly from people, research

participants or the organisation, by using a case study (Ang and Cummings, 1997). Secondary data refers to any materials that have previously been published, e.g. books, journals and articles.

This research will collect data as follows:

- *Literature study (secondary data)*: A literature study will be performed consisting of:
 - Usability and UX definitions and maturity models (Chapter 3);
 - Institutionalising UX in an organisation (Chapter 4);
 - Definition of e-Government, its components and the e-Government focus of this study. UX of e-Government websites internationally and in South Africa (Chapter 5);
 - UX in the Western Cape Government (WCG) (Chapter 6).

- *Surveys (primary data)*: South African PG employees, working closely with the website, will complete specific surveys. All participants will be informed that participation is voluntary and that they may withdraw at any stage without any consequences. Ethical regulations as provided by the Nelson Mandela Metropolitan University (NMMU) Ethics Committee will be upheld (Section 2.3). The surveys consist of UX maturity models identified in Chapter 3 (literature) as well as generic UX questions. The surveys to be completed are as follows:
 - *Survey of UX of South African PGs* (Chapter 5). This survey will demonstrate the need for the study by demonstrating the UX maturity in South African PGs. The survey will be completed by participants who are direct stakeholders of PG e-Government websites (such as Directors, Web Content Managers and Web Managers) in each PG in South Africa;
 - *Follow-up survey of UX of the WCG* (Chapter 6). This survey will give more details of current UX in the WCG, the PG used as the case study for this research. The survey will be completed by WCG officials who are directly involved with the WCG e-Government website;
 - *Confirmation survey of UX of the WCG* (Chapter 8). This survey will demonstrate if the WCG had an improved UX maturity model level after implementing the IUXG methodology. The survey will be completed by the same group of WCG officials who completed the follow-up survey;

- The data analysis of each survey will be done by grouping results into different categories. The categories of the UX maturity models as well as the IUXG methodology will be used. Patterns and relationships will be identified in the data in order to reach conclusions. The data will then be presented in a narrative summary. The analysis will be done in Microsoft Excel. No specific statistics will be used in this research study. The nature of the results will be qualitative.
- *Case study (primary data):* A methodology (IUXG) to Institutionalise UX in a South African PG will be designed, based on the results of the literature study and survey results. The IUXG methodology will be evaluated based on a case study on a South African PG (WCG):
 - Data for the case study will be obtained as follows:
 - The author of this research was employed at the WCG in mid-2010 as the Usability Team Leader (UTL). One of the roles of the UTL is to institutionalise UX in the WCG. The UTL will implement the steps of the proposed IUXG methodology to institutionalise UX in the WCG directorate responsible for the e-Government website: e-Government for Citizens. The implementation and results of the steps will also include inputs and information obtained from WCG employees and contract workers. Official procedures and professional protocols are followed and results are documented to obtain the case study results of this study;
 - The sub-steps of the proposed IUXG methodology may include, for example, focus groups and usability testing. Where these methods are used, informed consent documents will be used to provide each participant with the choice of either participating or not. The participant will be told about the scope and contents of the study in advance and will have the right to terminate participation at any time, as participation will be strictly voluntary;
 - The sub-steps are not the focus of the research. For example, a sub-step may be “*conduct usability testing*”. It is not the focus of this research to explain how to conduct usability testing. This research will however refer the reader to references on how to conduct usability testing. Further, Chapter 7 (Results) may report summarised

results of a usability test step; however, the results of these steps again are not the focus of the research;

- The IUXG methodology to institutionalise UX will be proposed and updated as follows:
 - IUXG 1.0: The initial, proposed IUXG methodology from the literature study (Chapter 4);
 - IUXG 1.1: The IUXG methodology will be updated after the follow-up survey results with WCG officials (Chapter 6);
 - IUXG 2.0: This will be the final proposed IUXG methodology (updated based on the case study results) and the main deliverable of this study (Chapter 8);
- The methodology is named and will be referred to as the Institutionalise User Experience in Government (IUXG) methodology;
- The data analysis of the case study will be done by grouping results into different categories. The categories of the IUXG methodology will be used. Patterns and relationships will be identified in the data to reach conclusions. The data will then be presented in a narrative summary. The nature of the results will be qualitative.

Chapter 1 listed the research objectives (ROs) and research questions (RQs) of this study. Table 2.1 lists the ROs and the correlating RQs of this study. Table 2.2 summarises the data collection methods explained above, as well as the ROs, RQs, related chapters and chapter deliverables of this study.

Table 2.1: Research Objectives and Questions

Research Objectives		Research Questions	
RO_M	To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).	RQ_M	Can a methodology be proposed and evaluated to institutionalise UX in a South African PG (IUXG 2.0)?
RO1	Recommend UX maturity model(s).	RQ1	What UX maturity model(s) can be identified from literature?
RO2	Propose a methodology for the institutionalisation of UX (IUXG 1.0).	RQ2a	What current UX methodologies can be identified from literature?
		RQ2b	What integrated methodology can be proposed to institutionalise UX (IUXG 1.0)?
RO3	Evaluate the maturity model level of UX in South African PGs.	RQ3	What is the maturity model level of UX in South African PGs?
RO4a	Re-evaluate the maturity model level of UX in the WCG.	RQ4a	What is the current maturity model level of UX in the WCG?
RO4b	Propose an updated methodology to institutionalise UX in a South African PG (IUXG 1.1).	RQ4b	What updated methodology should be proposed to institutionalise UX in a South African PG (IUXG 1.1)?
RO5	Evaluate the IUXG methodology (IUXG 1.1) using the Western Cape Government as a case study.	RQ5	Does the IUXG methodology (IUXG 1.1) institutionalise UX in the Western Cape Government?

Table 2.2: Chapters Addressing Research Questions and Objectives				
Research Objectives	Research Questions	Research Strategies and Data Collection Methods	Thesis Chapters	Chapter Deliverable
RO1	RQ1	<i>Literature study:</i> Usability and UX definitions and maturity models.	Chapter 3	UX maturity models for the PG survey.
RO2	RQ2a, RQ2b	<i>Literature study:</i> Institutionalising UX in an organisation. <i>Design and propose IUXG Methodology.</i>	Chapter 4	IUXG Methodology for the institutionalisation of UX (IUXG methodology 1.0).
RO3	RQ3	<i>Literature study:</i> Definition of e-Government, its components and the e-Government focus of this study. UX of e-Government websites internationally and in South Africa. <i>Survey:</i> Evaluation of UX maturity of South African PG websites.	Chapter 5	Survey results of the UX maturity level of South African PGs.
RO4a	RQ4a	<i>Literature study and survey:</i> UX maturity in the WCG.	Chapter 6	Follow-up survey results of the UX maturity level of the selected South African PG.
RO4b	RQ4b	<i>Update IUXG Methodology.</i>	Chapter 6	IUXG Methodology for the institutionalisation of UX in a South African PG (IUXG methodology 1.1).
RO5	RQ5	<i>Evaluate IUXG methodology:</i> Case study.	Chapter 7	Results of the case study. Gap analysis for the WCG.
Conclusions		Final evaluation of IUXG methodology, suggestions and future research. <i>(RO_m): To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).</i>	Chapter 8	Confirmation survey results of the UX maturity level of the WCG after the study. Updated IUXG methodology for the institutionalisation of UX in a South African PG (IUXG methodology 2.0).

2.3 Ethical Considerations

This section identifies the ethical considerations of this research. Ethics refers to “*the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it*” (Saunders, Lewis and Thornhill, 2009: 183). The most frequently used ethical issues considered in this study include:

- **Informed consent:** Participants in the research should be given the choice of either participating or not. Participants should be told about the scope and contents of the study in advance and will have the right to terminate their participation at any time, as participation is strictly voluntary;
- **Right to privacy:** The researcher must keep the nature and quality of participants’ performance strictly confidential, thus respecting participants’ right to privacy;
- **Honesty with professional colleagues:** Researchers must report their findings in a completely honest fashion, without misrepresenting what they have done or intentionally misleading others as to the nature of their findings. Under no circumstances should a researcher fabricate data to support a particular conclusion, no matter how seemingly “*noble*” that conclusion may be.

The Western Cape Government (WCG), the case study for this research, gave permission for the results of the study to be published (Appendix B). The NNMU Ethics Committee supported this action and gave ethical clearance and approval; reference number: H12-Sci-CS-013 (Appendix A). All participants are informed that participation is voluntary and that they may withdraw at any stage without any consequences. Participants are also informed that participation is confidential and no names will be revealed in any publications of the research results.

2.4 Research Sequence

Chapter 1 described the proposed thesis structure of this research (Sub-section 1.5.5 and Figure 1.3). The goal of this section is to motivate the selected sequence of the study (Chapter 3 to Chapter 8). The sequence of this research is demonstrated in Figure 2.3.

The research study starts with the definition of usability and UX, as well as UX maturity models (Chapter 3). The subsequent focus is an initial, proposed IUXG methodology from current literature in order to institutionalise UX (Chapter 4). Usability and UX is the foundation of this research and is hence the starting point. The study does not start with a government focus, as the government is

the application area of the study. A UX methodology for the application area (Provincial Government) is delivered.

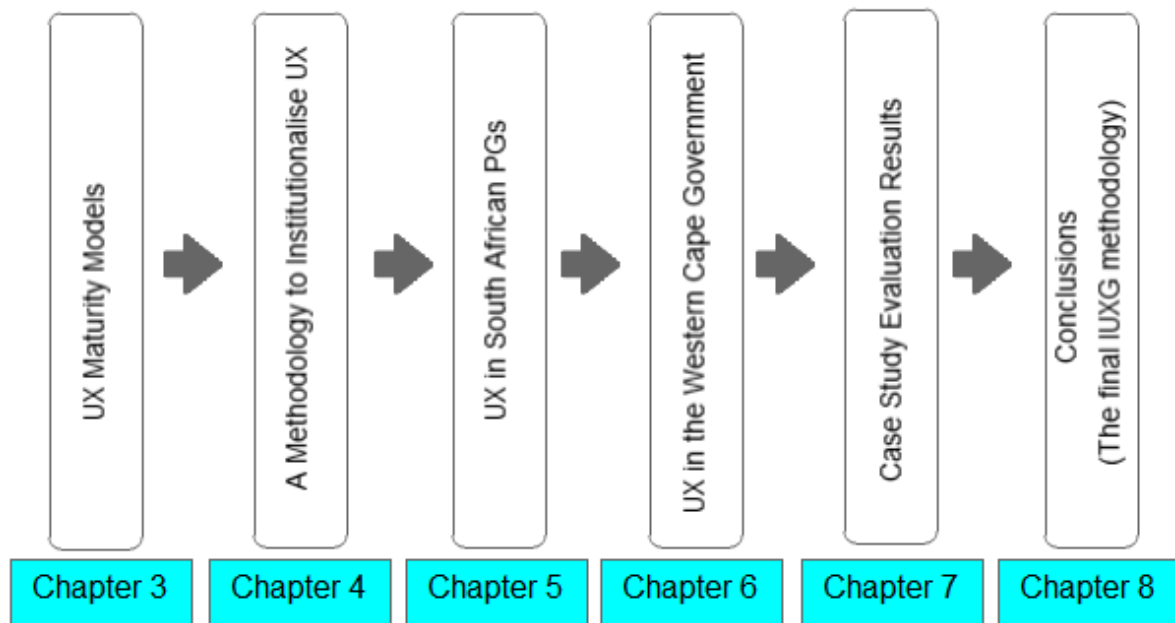


Figure 2.3: Research Sequence

Subsequent to the initial IUXG methodology proposal (Chapter 4), the focus moves to the application area, UX in South African PGs (Chapter 5) and UX in the WCG (Chapter 6). The UX maturity model level of South African PGs (Chapter 5) and the WCG (Chapter 6) is delivered. After the application area of this study has been examined, an updated IUXG methodology is proposed specifically for SA PGs (Chapter 6). Next, the IUXG methodology is evaluated by means of a case study in the WCG (Chapter 7). A final IUXG methodology is proposed (Chapter 8) based on the results and lessons learnt in Chapter 7.

2.5 Summary

The goal of this chapter was to determine the research design of the study. Research design is the general plan of how a researcher can proceed to answer the research questions (Saunders, Lewis and Thornhill, 2009). The research approach depends on a combination of interpretivism and positivism (Sub-section 2.2.1). Further, a combination of the inductive and deductive research approach is utilised (Sub-section 2.2.2). The research strategy of this study includes a case study and survey strategy (Sub-section 2.2.3). Results collected in this research study are qualitative.

The main research objective of this study is:

RO_M: To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).

The main research question of this study is:

RQ_M: Can a methodology be proposed and evaluated to institutionalise UX in a South African PG (IUXG 2.0)?

In order to answer the RO_M and RQ_M, data will be collected by means of a literature study, surveys and a case study (Sub-section 2.2.4). A single case study will be conducted using the WCG as the South African PG. Three surveys will be used during this research to determine the UX maturity level of South African PGs, as well as that of the WCG.

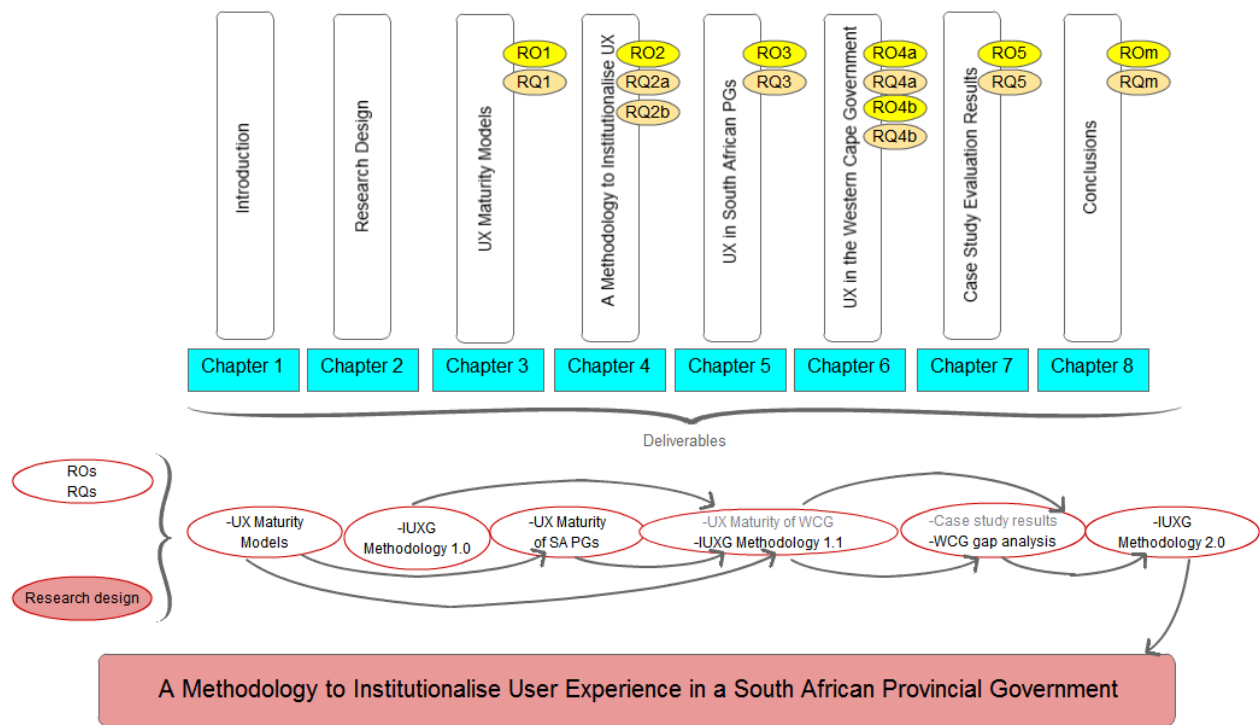
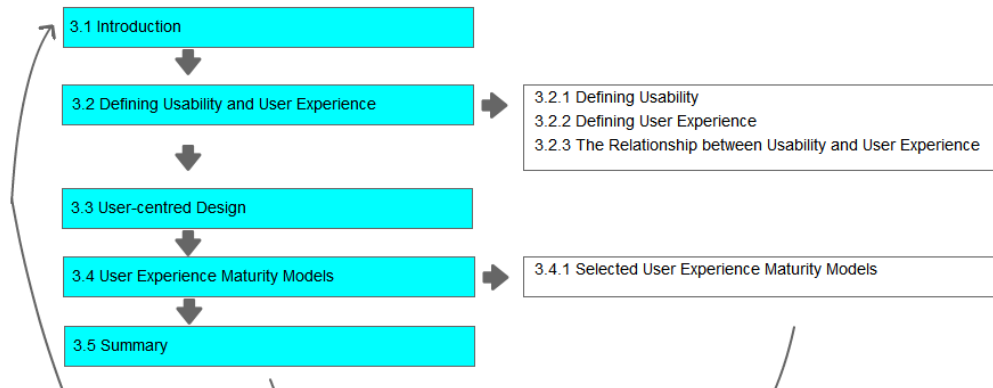


Figure 2.4: Chapters and Deliverables of the Study

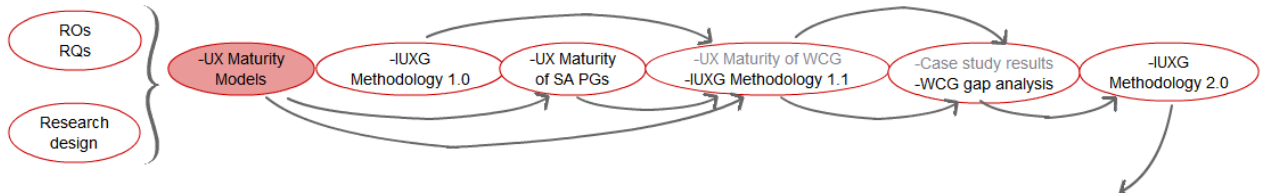
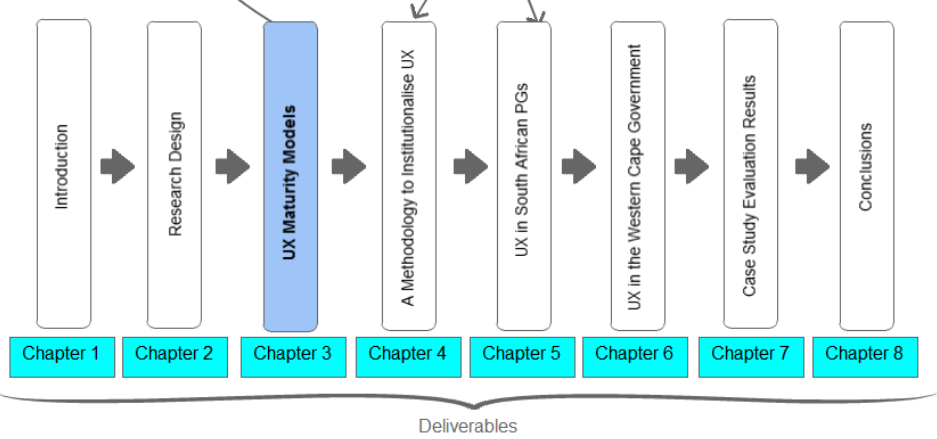
Table 2.2 listed the mapping of the ROs, RQs, data collection methods, chapters and deliverables of this research. Figure 2.4 summarises the chapters and the deliverables of this study (Sub-section 2.2.4). The chapters together with the corresponding research objectives and research questions are

shown. For example, RO1 and RQ1 are shown with Chapter 3. Figure 2.4 also illustrates the deliverables of the chapters and how they flow into each other. For example, “*UX maturity models*” are listed as a deliverable. The “*UX maturity models*” deliverable flows into the “*UX maturity of SA PGs*” deliverable and “*UX maturity of WCG*” deliverable. An adaptation of Figure 2.4 will be used at the start of each chapter to demonstrate the status of the research. The corresponding chapter and deliverable will be highlighted in colour. The next chapter initiates the literature study where usability and UX are defined and maturity models are proposed.

Chapter 3: User Experience Maturity Models



Deliverable:
UX Maturity Models



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 3: User Experience Maturity Models

3.1 Introduction

Governments around the world are leveraging advances in Information and Communications Technology (ICT) to enhance their service delivery mechanism and to improve citizen interaction and satisfaction towards government (Berman et al., 2010). Users interacting with government websites often experience that limited provision has been made to anticipate their needs or make information easily available and locatable on the Internet (Straub and Gerrol, 2008). The user experience (UX) of government websites does not compare well with the online experiences that citizens have when interacting with private sector websites.

UX is the new differentiator in customer service (Straub et al., 2009). Designing websites that customers can easily learn and confidently use, leads to improved customer satisfaction and increased loyalty (Straub et al., 2009). Users are less tolerant of websites that are difficult to use; every design flaw may lead to the loss of business opportunities. Problems with website usability prevent people from accessing and eventually adopting technology such as the Internet and e-Government (Pilling and Boeltzig, 2007). Users tend to leave a website with which it is difficult to interact (Nielsen, 2003).

Usability is an important factor in designing e-Government websites (Berman et al., 2010). In the United States, the importance of usability in government website design has grown and is considered best practice (Usability.gov, 2012a). Usability and the use of user-centred design (UCD) methodologies are not presently a standard or best practice in South African PGs. Usability and design guidelines do exist; however, in South Africa there are limited signs of utilisation (Berman et al., 2010; Yeratziotis, 2008). The challenge at present in the UX field is the institutionalisation of usability and UX (Schaffer, 2012).

UX maturity models allow the assessment of the degree of capability reached by an organisation and its ability to perform UX activities (Earthy, 1999). The deliverable of this chapter is to identify UX maturity models to evaluate the maturity of South African PGs. The UX maturity models identified in this chapter will be used in a survey that will be administered to South African PGs (results in Chapter 5).

The research objective addressed in this chapter is:

RO1. Recommend UX maturity model(s).

The research question addressed in this chapter is:

RQ1. What UX maturity model(s) can be identified from literature?

In order to achieve the research objective (RO1) and answer the research question (RQ1), an investigation of usability and UX is required. The definition of usability (Sub-section 3.2.1) and UX (Sub-section 3.2.2) as well as the relationship between usability and UX (Sub-section 3.2.3) is investigated. UCD, a key step in accomplishing usability and UX, is discussed in Section 3.3. UX maturity models are investigated in Section 3.4. Three models are selected to be used in this study (Sub-section 3.4.1). Section 3.5 summarises the findings of this chapter.

3.2 Defining Usability and User Experience

The goal of this section is to define usability (Sub-section 3.2.1) and UX (Sub-section 3.2.2). The relationship between usability and UX is further examined (Sub-section 3.2.3). Finally, the definitions of usability and UX, as used in this research, are defined.

3.2.1 Defining Usability

Usability has been defined by the International Organisation for Standardisation and by numerous researchers in the usability field as follows:

- The International Organisation for Standardisation (ISO 9241-11, 1998: 2) defines three aspects of usability: *“The extent to which a project can be used by specified users to achieve specified goals with **effectiveness**, **efficiency** and **satisfaction** in a specified context of use”*;
- The Usability Professionals Association (2011: 1) focuses on the product development process: *“Usability is an approach to product development that incorporates direct user feedback throughout the development cycle in order to reduce costs and create products and tools that meet user needs”*. In the context of this study, a product can refer to a website or electronic system;
- Steve Krug (Krug, 2000: 5) describes usability as: *“Usability really just means making sure that something works well: that a person of average (or even below average) ability and experience can use the thing – whether it’s a website, a fighter jet, or a revolving door – for its intended purpose without getting hopelessly frustrated”*;

- Usability is a quality attribute relating to how easy something is to use (Nielsen and Loranger, 2006). Usability refers to how quickly people can learn to use something, how efficient they are while using it, how memorable it is, how error-prone it is and how much users like using it (Nielsen and Loranger, 2006).

The definition of usability used in this study will be defined in Sub-section 3.2.3. The definition of usability has evolved over the past two decades (Wallace and Yu, 2009; Dubey and Rana, 2010). The progression of usability saw the description being expanded to include the user experience by stating that usability included both the usability of the system, e.g. how effective, efficient, safe and learnable it is, as well as the user's experience when interacting with the system, e.g. how satisfying, enjoyable or motivating the interaction is (Preece, Rogers and Sharp, 2007). The definition of usability is evolving over time and therefore usability evaluation needs to evolve to accommodate the safety, learnability and the emphasis on the subjective user experience (Poppe, Rienks and Van Dijk, 2007). User experience is defined in the following sub-section.

3.2.2 Defining User Experience

The usability of a system is measured in terms of efficiency, utility, effectiveness, safety, learnability and memorability. The role played by other aspects of the user experience (UX), such as whether the system is aesthetically pleasing and enjoyable is excluded (Moczarny, 2011). UX can be described as every aspect of the user's interaction with a system, service or company that make up the user's perceptions (Usability Body of Knowledge, 2012). UX design refers to making systems and services that are not only usable but also useful and appealing (Schaffer, 2004). UX design as a discipline is concerned with all the elements that together make up the user interface, including layout, visual design, text, brand, sound and interaction (Usability Body of Knowledge, 2012). UX aims to coordinate these elements to allow for the best possible interaction by users.

Unger and Chandler (2009) define user experience design as the creation and synchronisation of the elements that affect a user's experience with a particular company, with the intention to influence their perceptions and behaviour. These elements include (Unger and Chandler, 2009):

- The aspects with which users can interact, such as digital interfaces (websites and mobile phone applications);
- People; for example customer service representatives and sales people;

- The environment in which a user works matters as do physical products such as screens, keyboards and other input devices that will affect the way users interact with a design;
- The brand of the company.

The best website design possible cannot compensate for poor customer service (Unger and Chandler, 2009). UX is the overarching perception of all the facets of interaction with a company, its services, and its products (Delen, 2010). ISO FDIS 9241-210 (2009) defines UX as a person's perceptions and responses that result from the use and/or anticipated use of a product, system or anticipated use of a product, system or service. The International Organisation for Standardisation (ISO 9241-210, 2010) describes UX as being all aspects of the user's experience when interacting with the system. It includes aspects of usability and desirability of the system from the user's perspective.

UX is the value that is derived from a user's interactions with a system or service and the context of use (i.e. time, location and user disposition) (Moczarny, 2011). User value can be actual value (i.e. efficiency and effectiveness), perceived value (i.e. trustworthiness, emotions, satisfaction, aesthetic and social rewards, behaviour and entertainment) or a combination of both (Moczarny, 2011). Hassenzahl (2008) provides a two-part definition for UX:

1. A momentary, primarily evaluative feeling (good-bad) while interacting with a product or service;
2. Good UX is the consequence of fulfilling the human need for autonomy, competency, stimulation (self-oriented), relatedness and popularity (others-oriented) through interacting with a product or service (i.e., satisfaction quality).

Figure 3.1 illustrates the UX honeycomb as illustrated by Morville (2004). The goal of the honeycomb is to advance the understanding of UX beyond usability and to define project priorities (Morville, 2004). The priorities depend on a company's unique balance of context, content and users, as well as the available budget, timelines and goals. Morville (2004) explains each quality of the user experience in the honeycomb as follows:

- **Useful:** Is a product, system or website useful? Innovative solutions need to be defined that make the product more useful;
- **Usable:** The ease of use remains vital; however, interface centred methods and perspectives of human-computer interaction do not address all dimensions of Web design;

- **Desirable:** The value of image, identity, brand and other elements of emotional design play an important role;
- **Findable:** Users need to find what they need by using navigable websites and locatable objects;
- **Accessible:** Websites should be accessible to people with disabilities. In many countries this is required by law;
- **Credible:** Users need to trust a website and believe the information provided;
- **Valuable:** Websites must deliver value to sponsors and improve customer satisfaction. The user experience must advance the mission for non-profit organisations.



Figure 3.1: The User Experience Honeycomb

Source: Morville, 2004: 1.

The relationship between usability and UX, as well as the definition of UX used in this study, will be discussed next.

3.2.3 The Relationship between Usability and User Experience

Tullis and Albert (2008), state that usability is usually considered as the ability of the user to use a system to carry out a task successfully. UX takes a broader view, looking at an individual’s entire interaction with a system, as well as the thoughts, feelings and perceptions that result from the interaction (Tullis and Albert, 2008). The differentiating factor from more traditional usability is a wider goal: not just achieving effectiveness, efficiency and satisfaction, but optimising the whole user experience from expectation through actual interaction to reflection about the experience (Bevan, 2009a).

The following two questions, Spool (2007) asked to indicate the difference between usability and UX:

- Usability: Can users accomplish their goal?
- UX: Did the user have an experience as satisfying as possible?

The ISO definitions listed for usability (Sub-section 3.2.1) and UX (Sub-section 3.2.2) suggest that usability or UX can be measured during or after use of a product, system or service (Bevan, 2009a). A person's “*perceptions and responses*” in the definition of UX are similar to the concept of satisfaction in usability (Bevan, 2009a). There is no fundamental difference between measures of usability and measures of UX at a particular point in time (Bevan, 2009a).

In the context of UCD, usability and UX have the following concerns (Table 3.1):

Table 3.1: Usability and UX Concerns in Terms of User-centred Design.	
Source: Bevan, 2009a: 2.	
Usability	User Experience
Designing for and evaluating overall effectiveness and efficiency.	Understanding the user’s experience and designing a product according to the user’s experience: the way in which people interact with a product over time: what they do and why.
Designing for and evaluating user comfort and satisfaction.	
Designing to make the product easy to use, and evaluating the product in order to identify and rectify usability problems.	
When relevant, the temporal aspect leads to a concern for learnability.	

In summary, UX can be conceptualised in different ways (Bevan, 2009a):

- An elaboration of the satisfaction component of usability (Bevan, 2009b);
- Distinct from usability, which has a historical emphasis on user performance (Roto, Obrist and Väänänen-Vainio-Mattila, 2009);
- An umbrella term for all the user's perceptions and responses, whether measured subjectively or objectively (ISO FDIS 9241-210, 2009).

This study will use the following definitions for usability and UX:

- *Usability*: How quickly people can learn to use a system; how efficient they are while using it; how memorable it is; how error-prone it is and how much users like using it (Nielsen and Loranger, 2006);
- *UX*: All aspects of the user's experience when interacting with the system that produce the user's perceptions (ISO 9241-210, 2010; Usability Body of Knowledge, 2012). UX design refers to making systems and services that are not only usable but also useful and appealing (Schaffer, 2004).

Usability is probably the most important factor that shapes UX (Fredheim, 2011). Usability is an indicator of the UX that a website will deliver. Usability is a strong focus of this research and will refer to UX, where it is implied that usability is a sub-set of UX. Several authors in the literature used in this study, use the term interchangeably. In this research the author will refer to UX; however, where relevant, the terminology used by the relevant author in the literature will be used. For example: Schaffer (2004) refers to a usability model and Feijo (2010) refers to a UX maturity model. UX can be achieved by keeping the user involved throughout the project development lifecycle. The UCD process involves the end-user in an active and collaborative way (Buganza, Corubolo, Della Valle and Pellizzoni, 2011) and is discussed next.

3.3 User-centred Design

UX professionals employ an iterative, UCD process; usability means UCD (Six, 2011; Quesenbery, 2012). UX can be achieved by following UCD processes, where the users are involved at different stages throughout. These include requirements at the start, as well as on-going reflection about the experience. UCD is defined as design that involves the user's input throughout the product development lifecycle from information gathering, development and evaluation, through to implementation (Abels, White and Hahn, 1999; Moczarny, 2011). The goal to achieve improved

UX with the product leads to increased emphasis on user methods. The user methods assist understanding of what can be done to improve the experience through the complete lifecycle of user involvement (Bevan, 2009a).

UCD processes focus on users through the planning, design and development of a product (Usability Professionals Association, 2012). ISO 9241-210 (2010) defines a general process for including human-centred activities throughout a development lifecycle. This lifecycle is illustrated in Figure 3.2. In this model, once the need to use a human-centred design process has been identified, four activities form the main cycle of work (Usability Professionals Association, 2012):

- *Specify the context of use:* Identify the people who will use the product, what they will use it for, and under what conditions they will use it;
- *Specify requirements:* Identify any business requirements or user goals that must be met for the product to be successful;
- *Create design solutions:* This part of the process may be done in stages, building from a rough concept to a complete design;
- *Evaluate designs:* The most important part of this process ideally achieved through usability testing with actual users.

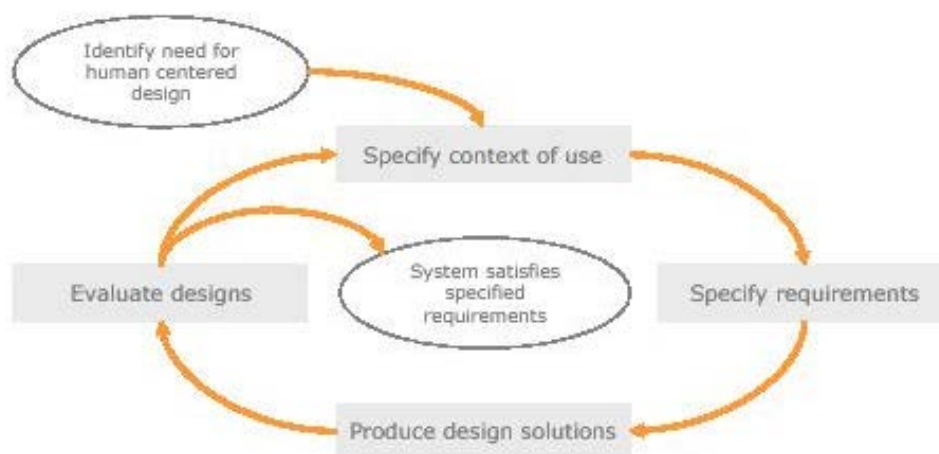


Figure 3.2: User-centred Design Process

Source: Usability Professionals Association, 2012: 1.

Creating a user experience on websites involves more than one single factor (Moczarny, 2011). Rubinoff (2004) describes UX as consisting of four independent factors: branding, usability, functionality and content. Independently, these factors cannot contribute to a positive UX, but if

combined, they can constitute to the main ingredients for a website's success (Rubinoff, 2004; Moczarny, 2011).

Van Duyne, Landay and Hong (2007) use the term customer-centred design (CCD) instead of user-centred design in order to include UX. Their reasoning is that the term customer evokes the idea that successful websites account for issues that go beyond ease of use and satisfaction, such as trustworthiness, brand value and even how well a company's traditional interactions with the customer work (such as telephone-based customer service). Further, the authors state that the term customer is more expansive than user and refers to not only the traditional customer, but also to administrators, partners and managers.

Figure 3.3 illustrates the key issues driving CCD (Van Duyne, Landay and Hong, 2007). A customer-centred website is achieved when visitors consistently give a website high marks for *content, ease of use, performance, trustworthiness* (as well as other indicators of brand value) and *overall satisfaction* (Van Duyne, Landay and Hong, 2007).

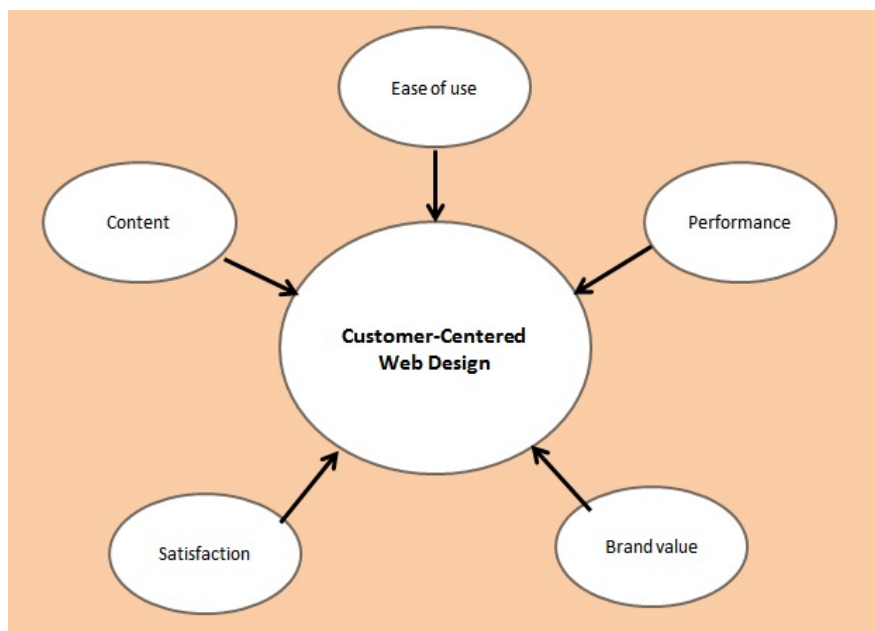


Figure 3.3: The Key Issues Driving CCD

Source: Van Duyne, Landay and Hong, 2007: 5.

Figure 3.4 illustrates the UX wheel, a UCD process with the focus on UX (Revang, 2007). The process consists of a: strategic phase; conceptual phase; development phase and a production phase. Figure 3.4 is explained from the centre of the illustration (Revang, 2007):

- Value needs to be accomplished;
- A positive user experience is a win-win situation for both customers and providers. Value is accomplished through a positive user experience;
- The user experience is a series of phases, including: findability, accessibility, desirability, usability, credibility and usefulness;
- Numerous strategically placed factors contribute to the phases of UX;
- To achieve this, the model is viewed in an anti-clockwise direction, starting and ending with search engine strategy.

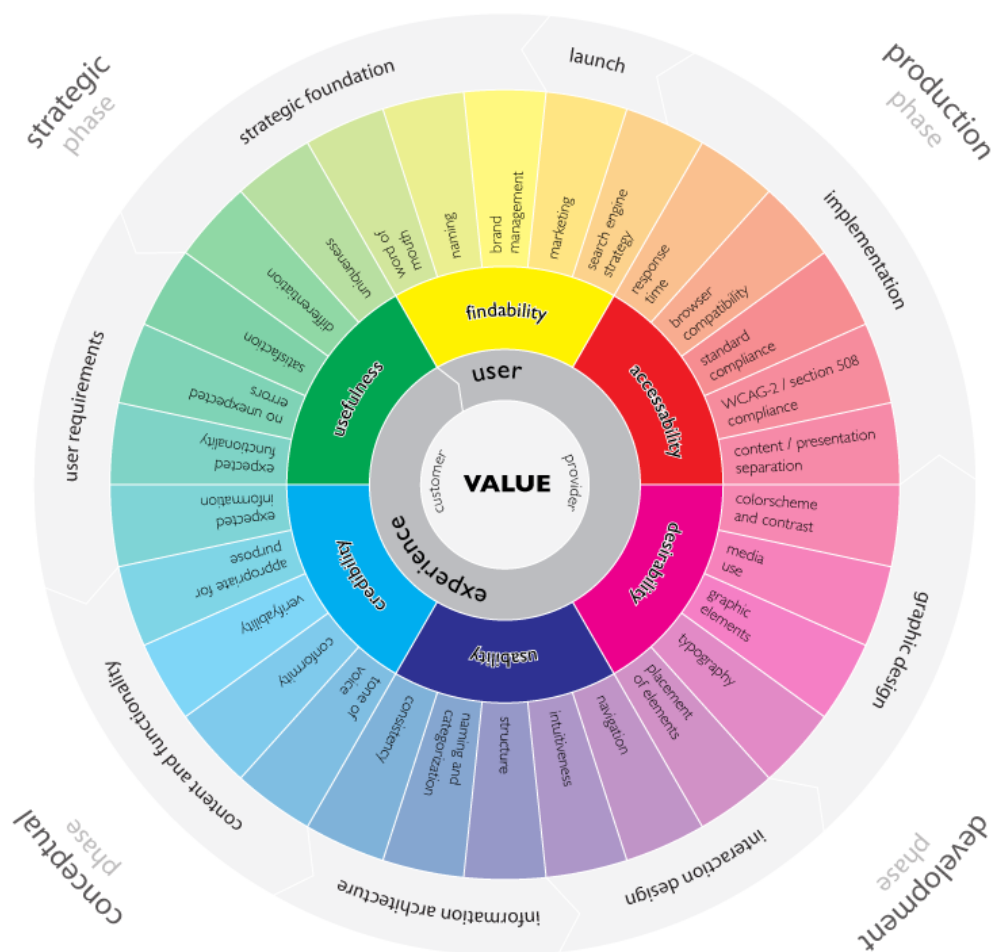


Figure 3.4: The User Experience Wheel

Source: Revang, 2007: 1.

This section described UCD, an important step in institutionalising UX. UCD is an important step; however, additional steps are required to institutionalise UX. In the following chapter, UCD will be included as a step in the proposed methodology to institutionalise UX. The next section investigates

UX maturity models used in organisations, in order to measure how far UX is institutionalised in an organisation.

3.4 User Experience Maturity Models

UX maturity models allow an organisation to measure its current institutionalisation status of UX and also assist to identify the status at which the organisation wishes to be. The UX maturity models identified in this section are referred to as usability, human-centred design and UX models by the respective authors. Organisations that need to measure this status, typically have a product, website, system or customer-facing component. The standards related to usability of the product can be categorised as primarily concerned with (Bevan, 2006) (Figure 3.5):

- The use of the product (effectiveness, efficiency and satisfaction in a particular context of use);
- The user interface and interaction;
- The process used to develop the product;
- The capability of an organisation to apply UCD.

Figure 3.5 illustrates the relationship between these categories: the organisation's product must be effective, efficient and satisfying when used in the intended contexts (Bevan, 2006); a prerequisite for this is an appropriate interface and interaction. This requires a UCD process, which, to be achieved, consistently requires an organisational capability to support UCD (Bevan, 2006). The focus of this study is on a methodology to institutionalise UX in South African Provincial Governments (PGs). This focus relates strongly to the last point above, namely "*the capability of an organisation to apply UCD*".

A need exists to measure how well organisations conduct the human-centred part of system development and how well they support projects (Earthy, 1998). Different levels of maturity (Table 3.2, Table 3.3) in usability engineering exist (Schaffer, 2004). A scale will assist professionals who wish to improve their organisation's performance of human-centred activities (Earthy, 1998). An organisation with a low rating is unlikely to be able to conceive of the processes necessary to bring about the highest levels of maturity. However, a scale will help an organisation to be able to understand the benefits of the next level of maturity and the organisation will be able to see how to extend what has been already achieved in order to improve or move up a level.

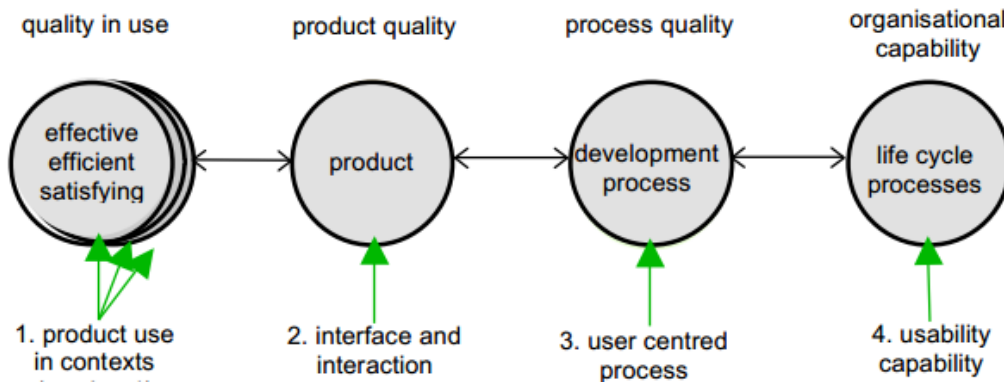


Figure 3.5: Standards Related to Usability

Source: Bevan, 2006: 2.

Usability in an organisation is mature when the following components are integrated into an organisation (Schaffer, 2004; Straub et al., 2009):

- *An executive champion:* An executive who has made a clear and visible commitment to promoting usability throughout the organisation (including educating employees, funding and removing obstacles);
- *User interface standards:* Design standards should go beyond brand and identity to define the underlying look, feel and flow of websites and applications within an organisation;
- *Professional staff:* Team members should represent multi-disciplinary skills that define UX in a business sector. These include psychologists and researchers, human factors engineering, interaction design, visual design and analytics/measurement specialists. Team members should have formal usability training that is substantiated by degrees or certifications. Tactical and strategic initiatives must also be supported;
- *Tools:* All individuals who are tasked with interface design should have open access to a common set of resources to educate and support best practices in research processes and interface design. The toolset should include reusable artefacts that practitioners can employ to streamline their work;
- *Training:* Different individuals at different levels within organisations need to understand different information about usability. Practitioners need on-going, advanced training on emerging methods, evolving best practices and current trends across industries;
- *Showcase projects:* Showcase projects are high-visibility projects that receive support and recognition throughout the organisation. Mature programmes create and distribute case studies to recognise, validate and disseminate the successes of the usability group;

- *Enterprise Knowledge Management*: A usability knowledge management system should be the single, central repository for all resources and artefacts related to usability and the practice of usability within an organisation. Usability groups aggregate and share their charter, strategy, standards, reusable research and design artefacts (e.g., personas, graphics library) in a common location;
- *Digital UX Strategy*: Mature usability organisations have a clear, actionable digital UX strategy that identifies touch points and synergies of usability across the inward and outward-facing customer communication systems.

Organisations typically progress through a sequence of stages as their usability processes evolve and mature (Nielsen, 2006). Nielsen lists eight stages of corporate usability maturity; these stages are summarised in Table 3.2. The sequence is fairly universal, allowing organisations to match their current stage of usability and to identify their future stage (Nielsen, 2006). The model starts with an organisation being hostile towards usability (Stage 1) where developers simply do not consider users or their needs. The model progresses to the final stage (Stage 8) where an organisation is user-driven: where an organisation employs user research to determine its overall direction and priorities. The model has the following stages (explained in Table 3.2):

- Stage 1: Hostility towards usability;
- Stage 2: Developer-centred usability;
- Stage 3: Skunkworks usability;
- Stage 4: Dedicated usability budget;
- Stage 5: Managed usability;
- Stage 6: Systematic usability process;
- Stage 7: Integrated user-centred design;
- Stage 8: User-driven corporation.

Earthy (1998) developed a model to determine the level of maturity reached by an organisation in its capability to do human-centred design. Schaffer (2004) adopted the Earthy model to identify an organisation's usability maturity. Table 3.3 summarises the six level (level 0 – level 5) Schaffer model. These steps reflect the progression of concerns and practices observed in organisations which adopt a human-centred approach to systems development and management. Corresponding with Nielsen (2006), Schaffer (2004) states that there are typical levels for companies to progress through. The model starts with an organisation being clueless (level 0), where an organisation is

unaware of usability as a formal discipline. The model progresses to the final level where usability is a routine practice and has been institutionalised (Schaffer, 2004). The model has the following stages (explained in Table 3.3):

- Level 0: Clueless;
- Level 1: Piecemeal usability;
- Level 2: Managed usability;
- Level 3: Infrastructure;
- Level 4: Staffing;
- Level 5: Routine usability.

Temkin and Geller (2008) defined five levels of *customer-based differentiation maturity*. Feijo (2010) adopted this model to reflect a six level UX Maturity Model (Figure 3.6). The model starts with an organisation not recognising UX (level 1) up to the level where UX is fully embedded in an organisation (level 6). The model has the following levels (explained in Figure 3.6):

- Level 1: Unrecognised;
- Level 2: Interested;
- Level 3: Invested;
- Level 4: Committed;
- Level 5: Engaged;
- Level 6: Embedded.

Table 3.4 summarises UX maturity models with their relevant stages (Earthy, 1998; Schaffer, 2004; Nielsen, 2006; Feijo, 2010; Stagers et al., 2011). Relevant maturity models will be selected from the list in Table 3.4 in order to assess the UX maturity of South African PGs. The models typically range from UX not being recognised (first step) to UX being institutionalised (last step). Based on similar categories throughout the models, the different stages are given a high-level summary as follow:

- UX is not recognised (first step in models);
- UX starts to emerge;
- Organisations start to show commitment towards UX;
- UX processes are starting to mature and form part of the organisation's culture;
- UX is institutionalised (last step in models).

Table 3.2: Nielsen's (2006) Maturity Model

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
Hostility Toward Usability	Developer-Centred Usability	Skunkworks Usability	Dedicated Usability Budget	Managed Usability	Systematic Usability Process	Integrated User-centred Design	User-Driven Corporation
Developers simply do not want to hear about users or their needs.	The organisation realises the value of making designs easier for humans to use.	Despite all the barriers, at this stage, a few groups within the organisation will initiate small usability efforts.	The organisation starts to invest more in usability.	Usability has " <i>made it</i> ".	The organisation has recognised the need for an actual user-centred design process, with multiple activities and milestones.	Each development lifecycle step is infused with user data, including the project definition itself and the requirements phase.	User data does not just define individual projects, it determines what types of projects should be funded.
Users are told to use the system, even if it is not pleasant to do so.	The design team relies on its own intuition (not through usability testing) about what constitutes good usability.	There is still no official recognition of usability, nor is there an approved budget allocated in advance.	A dedicated budget for usability exists.	There is an official usability group, led by a usability manager who has a charter to " <i>own</i> " usability.	On important projects, the team conducts early user research before design begins.	Quality is often tracked through quantitative usability metrics.	The organisation employs user research to determine its overall direction and priorities.
		All usability activities are ad hoc.	The main usability method is user testing late in the development process.	The usability group refines its methodology as members learn from each other.	The organisation has a user interface design standard or a centralised definition of preferred design patterns.	Usability data is starting to be used to determine what Web services should be built.	Usability methods affect corporate strategy and activities beyond interface design.
				The usability budget is too limited to implement all the recommended usability activities for all projects.	Even projects without many usability resources go through at least some form of usability review before they are approved for release.		The concept of total user experience is extended beyond the screen to other forms of customer interactions with the company.

Table 3.3: Schaffer's (2004) Maturity Model

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
Clueless	Piecemeal Usability	Managed Usability	Infrastructure	Staffing	Routine Usability
At this level, the organisation is unaware of usability as a formal discipline.	Individuals are trying to apply usability techniques to some projects but there is no commitment by the organisation, and usability is not managed under an overall strategy.	The organisation recognises the need for usability as a core competency.	There is a solid infrastructure for usability work and a user-centred methodology is being followed.	At this level there is sufficient staff to handle the full set of projects executed by the government.	Usability is a routine practice and has been institutionalised.
Design is based on intuition and political arguments.	The effort is not integrated or accepted in the design process.	An executive champion has been identified and usability is part of a plan.	Reusable templates and tools are in place.	All projects have usability support to an appropriate level.	Projects do not proceed without usability being involved.
Any usability effort is directed by a stream of complaints and demands from customers.	Very good work can happen at this level, but usability is immature and not yet institutionalised.	Although much more work needs to be done, the usability effort is no longer fragmented experiments.	Usability industry standards are followed.		The usability practitioners have a strong and mature voice and lead design from the front.

Table 3.4: User Experience Maturity Models					
Consolidated Stages of the models	Earthy, 1998	Schaffer, 2004	Nielsen, 2006	Feijo, 2010	Staggers et al., 2011
UX is not recognised (first step in models)	Unrecognised	Clueless	Hostility towards usability	Unrecognised	Unrecognised
	-	-	Developer-centred usability	-	-
UX starts to emerge	Recognised	Piecemeal usability	Skunkworks usability	Interested	Preliminary
Organisations start to show commitment towards UX	-	-	Dedicated usability budget	Invested	-
	Considered	Managed usability	Managed usability	Committed	Implemented
UX processes are starting to mature and form part of the organisation's culture	Implemented	Infrastructure	Systematic usability process	Engaged	-
	Integrated	Staffing	Integrated user-centred design		Integrated
UX is institutionalised (last step in models)	Institutionalised	Routine usability	User-driven corporation	Embedded	Strategic



Figure 3.6: User Experience Maturity Model

Source: Feijo, 2010: 1.

The reasoning for the selection of the specific models in this study is discussed next.

3.4.1 Selected User Experience Maturity Models

Different UX models were described and summarised in the Section (3.4) above. The purpose of this sub-section is to select maturity models to be used in the survey to determine the UX maturity of South African PGs (Chapter 5). Earthy (1998) was one of the first authors to develop a maturity model. The model was developed in order to make the nature of organisational maturity clear with regard to human-centredness and its implications for system maturity modelling. Schaffer (2004) adopted the Earthy model to identify an organisation's usability maturity. Therefore, the Schaffer (2004) model will be used as it is an updated model, based on Earthy's (1998) model.

Nielsen's (2006) model is the only model with more than six stages. The naming of the relevant stages is also quite different to the other maturity models. Therefore, the Nielsen, 2006 model will be included in this study. Feijo (2010) was the only author to refer to a model as a UX model. Due

to this reason and also because it is relatively new research, published in 2010, the Feijo (2010) model will also be used for this study.

Staggers et al. (2011) investigated the Earthy, Schaffer and Nielsen models to develop their model. The Staggers et al. (2011) model will not be used to evaluate the maturity of usability in South African PGs in this study, as it was not available when this study started in 2010. However, the Staggers et al. (2011) model is recognised as a maturity model to be used in future research.

Based on the reasons above, the following maturity models will be used in this study:

- Schaffer (2004);
- Nielsen (2006);
- Feijo (2010).

Three models are selected for this study, in order to compare the results across the models. This also allows for future research to recommend an updated model, based on the models above.

3.5 Summary

Section 3.1 identified the deliverable of this chapter: *to identify UX maturity models to evaluate the maturity of SA PGs*. The research objective of this chapter was:

ROI. Recommend UX maturity model(s).

The related research question of this chapter was:

RQ1. What UX maturity model(s) can be identified from literature?

In order to reach the objective of this chapter, usability and UX had to be defined. Usability means how quickly people can learn to use a system; how efficient they are while using it; how memorable it is; how error-prone it is and how much users like using it (Nielsen and Loranger, 2006) (Sub-section 3.2.1). The definition of usability has grown over the years to look at the wider user experience. UX is all aspects of the user's experience when interacting with the system that produce the user's perceptions (ISO 9241-210, 2010; Usability Body of Knowledge, 2012). UX design refers to making systems and services that are not only usable but also useful and appealing (Schaffer, 2004).

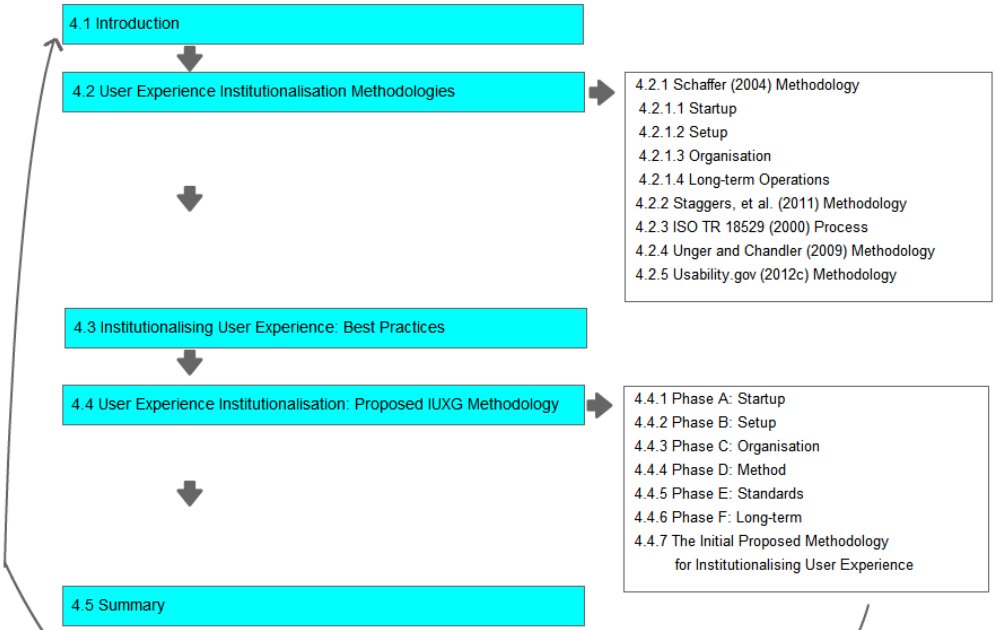
There is a relationship between usability and UX. UX provides a wider goal: not only to achieve effectiveness, efficiency and satisfaction, but to optimise the whole UX experience from expectation through actual interaction to reflection about the experience (Bevan, 2009a) (Sub-section 3.2.2). UX includes all aspects of the end-user's interaction with the company, its services and its products (Van Greunen, 2010).

Usability and UX can be implemented through UCD (Section 3.3). UCD is an approach that supports the entire development process with user-centred activities, in order to create applications which are easy to use and are of added value to the intended users (Usability Net, 2011). UCD will be included as a step in the proposed IUXG (Institutionalise UX in Government) methodology (Chapter 4).

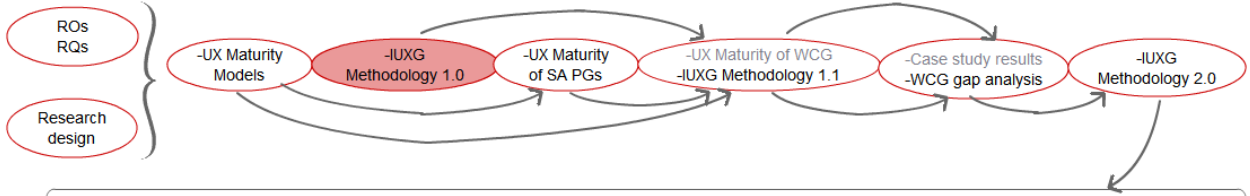
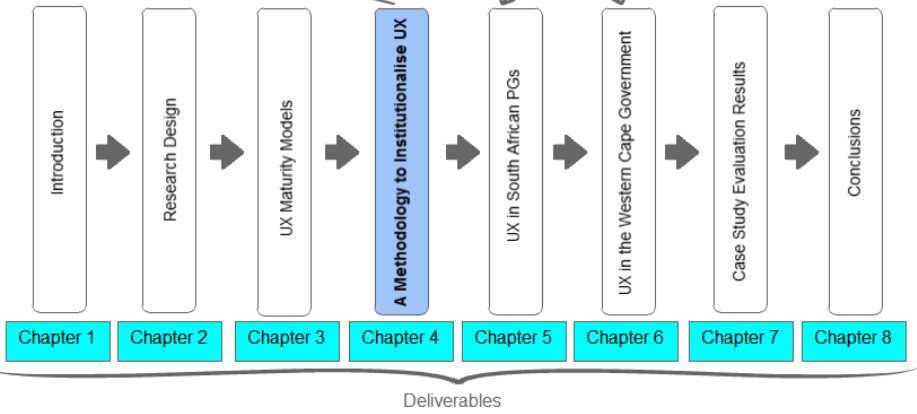
In order for UX to be institutionalised in an organisation, people need to be provided with tools, methods and resources, which includes internal and external personnel (Schaffer, 2004). A need exists to measure how well organisations conduct UX in their organisations (Earthy, 1998). UX maturity models allow an organisation to measure its current status and to identify the status where it wishes to be (Section 3.4).

The problem researched in this study is that UX processes are not mature and institutionalised in South African PGs. Three UX maturity models were identified in this chapter: Schaffer (2004), Nielsen (2006) and Feijo (2010) (Sub-section 3.4.1). These identified models answer the research question (RQ1) of this chapter. The maturity models will be used in a survey (Chapter 5) to determine the UX of South African PGs. In the next chapter institutionalisation of UX will be investigated and the first IUXG methodology will be proposed.

Chapter 4: A Methodology to Institutionalise User Experience



Deliverable: IUXG Methodology 1.0



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 4: A Methodology to Institutionalise User Experience

4.1 Introduction

Knowing when and why to use user experience (UX) techniques takes experience (Ide-Smith, 2011a). A number of UX methods, tools and guidelines exist that guide designers in creating solutions (Schaffer, 2004; Yeratziotis, 2008; Unger and Chandler, 2009; Asimwe and Lim, 2010; AlFawwaz, 2011; Howto.gov, 2011b; Usability.gov, 2012c); however, their effectiveness depends extensively on the profiles of the individuals in a team and on an organisation's understanding of UX (Jorge, 2012). Usability engineers are typically left unsupported in large organisations (Schaffer, 2004).

UX maturity models allow the assessment of the degree of capability reached by an organisation and its ability to perform human-centred design activities (Earthy, 1999). Chapter 3 proposed UX maturity models to measure how well organisations conduct UX in their organisations. Three UX maturity models were identified in Chapter 3: Schaffer (2004), Nielsen (2006) and Feijo (2010). The identified maturity models will be used in Chapter 5 to identify the UX maturity level of South African Provincial Governments (PGs).

The challenge at present in the UX field is the institutionalisation of usability and UX (Schaffer, 2012). The institutionalisation of UX is important if an organisation has to move from an ad hoc user-centred design (UCD) approach to a sustained and managed UX practice (Human Factors International, 2012a). Institutionalising UX provides people with tools, methods and resources, including internal and external personnel (Israelski, 2004). This makes the decision making process more efficient as the need for usability does not have to be questioned for every project (Israelski, 2004). The institutionalisation of usability has become extremely important (Schaffer, 2004).

The deliverable of this chapter is a proposed IUXG (Institutionalise UX in Government) methodology to institutionalise UX in an organisation (IUXG 1.0, as discussed in Chapter 2). The research objective addressed in this chapter is:

RO2. Propose a methodology for the institutionalisation of UX (IUXG 1.0).

The research questions addressed in this chapter are:

RQ2a. What current UX methodologies can be identified from literature?

RQ2b. What integrated methodology can be proposed to institutionalise UX (IUXG 1.0)?

Chapter 5 and Chapter 6 will investigate National e-Government and PG websites. The methodology proposed in this chapter will be updated in Chapter 6, in order to be applicable directly to South African PGs. Section 4.2 of this chapter investigates UX institutionalisation methodologies. Section 4.3 discusses best practices for the implementation of UX. Section 4.4 proposes a preliminary IUXG methodology based on Section 4.2 and 4.3. Section 4.5 summarises the findings of this chapter.

4.2 User Experience Institutionalisation Methodologies

The goal of this section is to investigate UX institutionalisation methodologies. The methodologies of the following authors will be investigated:

- Sub-section 4.2.1: Schaffer (2004);
- Sub-section 4.2.2: Staggers et al. (2011);
- Sub-section 4.2.3: ISO TR 18529 (2000);
- Sub-section 4.2.4: Unger and Chandler (2009);
- Sub-section 4.2.5: Usability.gov (2012c).

The research conducted by these authors was the most applicable literature found on institutionalising UX in organisations. The UX methodologies identified in this section are referred to as usability and UX methodologies, as well as human-centred processes by the respective authors. The UX methodologies investigated in this section, as well as the best practices discussed in Section 4.3, will be combined and structured to propose a UX institutionalisation methodology, IUXG methodology 1.0 (Section 4.4).

4.2.1 Schaffer (2004) Methodology

Schaffer (2004) created a methodology for institutionalising usability within an enterprise. Schaffer indicates that there is no simple approach that can be applied to all organisations. Schaffer's methodology is a roadmap that needs to be customised to an organisation's needs. The methodology has four major phases:

- **Startup:** alerting the organisation to the need to make usability a routine internal capability;

- **Setup:** the essential core infrastructure of methods, templates, standards and internal training;
- **Organisation:** the need for proper staff structures;
- **Long-term operations:** characterise the established operation of the central usability group.

Figure 4.1 illustrates the four phases in the Schaffer (2004) methodology. These phases and the included sub-steps are discussed next.

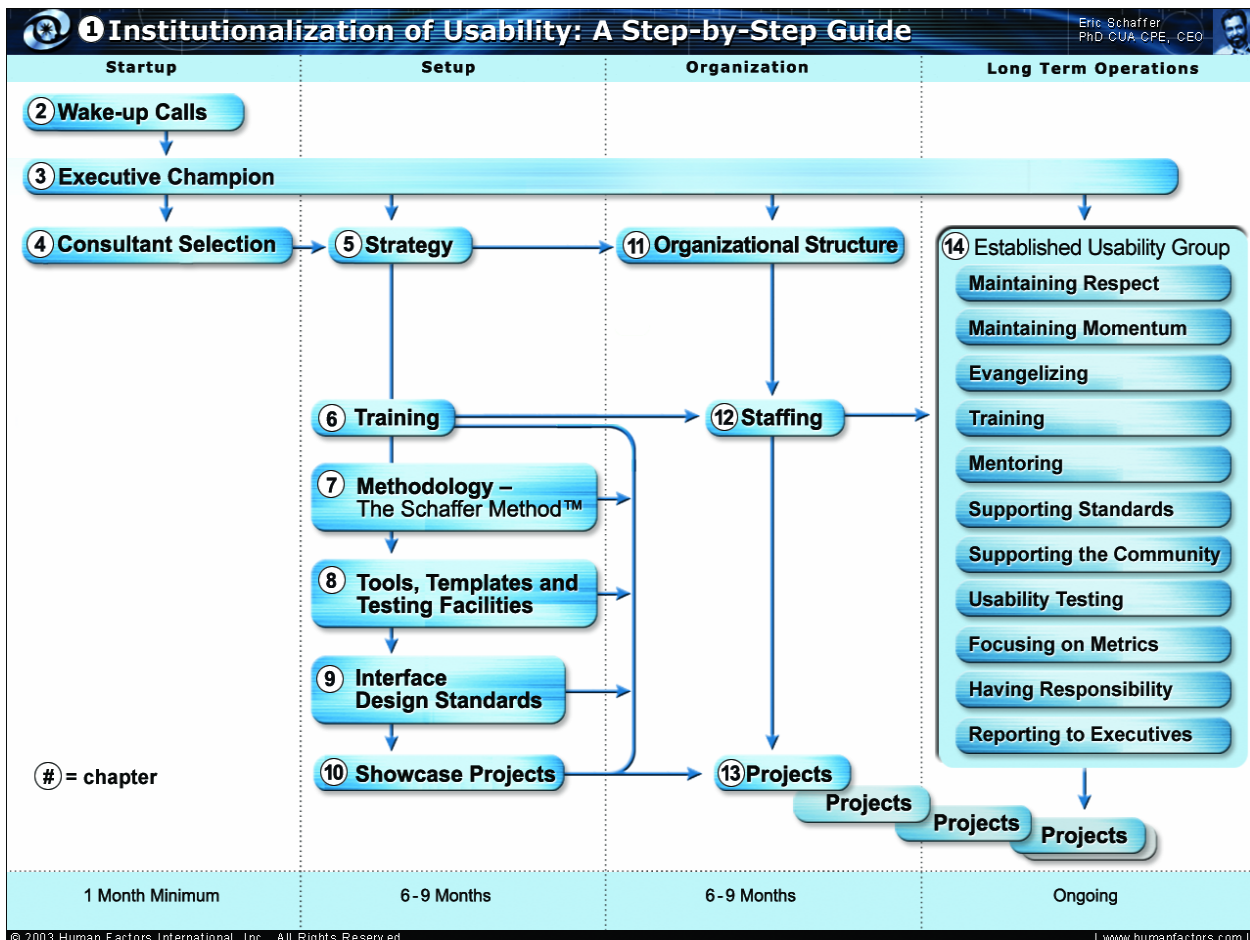


Figure 4.1: Institutionalisation of Usability Methodology

Source: Schaffer, 2004: 256.

4.2.1.1 Startup

The purpose of the startup phase is to bring attention to the issue of usability; to align the mandatory executive and consultant resources to start a usability initiative. Table 4.1 lists the steps and step descriptions for the startup phase of the Schaffer (2004) methodology. The steps include a wake-up call; finding an executive champion and procuring a usability consultant. It is rare to find

an organisation that starts out with a focus on usability; therefore there is a need for an initial wake-up call on the value of easy-to-use products. The executive champion provides the leadership, strategy, resources and coordination for going forward after the wake-up call. A usability consultant can help to start the usability programme.

Table 4.1: Schaffer (2004) Methodology – Phase 1: Startup	
Steps	Description
Wake-up call	The attention of the organisation needs to move towards the issue of usability. Types of wake-up calls: train wrecks, executive insights; new staff; education; expert reviews; usability testing; and new technologies.
Executive champion	This person provides the leadership, strategy, resources and coordination for going forward. The champion must be in a senior position in the organisation to move the resources and culture forward.
Procure a usability consultant	Help is required to get started. A good usability consultancy is invaluable to help an organisation transition to an efficient and thorough UCD process. A good consultancy guides strategy, sets up infrastructure, helps to develop staff and smoothly transitions to a structure that supports the internal group.

4.2.1.2 Setup

The setup phase aims to build the infrastructure in order for the on-going UCD process to be completed in an efficient, repeatable and professional manner (Schaffer, 2004). Table 4.2 lists the steps and step descriptions for the setup phase. It includes the strategy; training; methodology; tools, templates and testing facilities; interface design standards and showcase projects.

The strategy needs to fit a specific organisation and can evolve over time. Both knowledge and skills training (explained in Table 4.2) need to be provided to in-house staff. The system development lifecycle (methodology) of an organisation needs to include UCD. Tools, templates and a usability testing facility are required to conduct the UCD activities. Interface design standards will assist in achieving consistency across websites/systems. Finally, showcase projects will assist to share the value of usability with the whole development community.

Table 4.2: Schaffer (2004) Methodology – Phase 2: Setup	
Steps	Description
Strategy	The usability strategy should be specific about what will be done. A strategic plan should be just a few pages long and should outline the specific steps, resources and staff responsibilities. It should include the timing, sequence, validation and funding that will be necessary for the usability programme to be successful. The strategy may evolve over time.

Table 4.2: Schaffer (2004) Methodology – Phase 2: Setup	
Steps	Description
Training	<p>Training is an effective way to promote usability and to ensure that key staff members have the required skills.</p> <p><i>Knowledge training:</i> Educate staff members about the importance of the process of usability.</p> <p><i>Skills training:</i> Develop staff members who will be conducting interface design work. Aim for certification for the most highly trained staff members.</p>
Methodology	<p>A methodological standard describes how to conduct UCD; a methodology that will work for a specific organisation has to be selected.</p> <p>It is important to have a UCD process in place, one integrated with current methods and accepted by management and staff. This serves as a roadmap to direct usability engineering into the design process.</p>
Tools, templates and testing facilities	<p>This toolkit (tools, templates, testing facilities) allows efficient completion of the methodology. This toolkit should include a venue for testing, templates for questionnaires and deliverables, and usability testing equipment.</p>
Interface design standards	<p>Interface design standards save development time, maintain consistency in designs, improve usability and make maintenance easier. Standards are critical for both the usability staff and the developers. Design standards can be applied to a website and also to all of an organisation's public sites, extranets and intranet.</p>
Showcase projects	<p>A showcase project is the “<i>test flight</i>” of the new usability engineering infrastructure. This project offers an opportunity to refine the methodology and toolkit. It can give new staff practical experience and can demonstrate the feasibility and value of usability work in the actual business environment.</p>

4.2.1.3 Organisation

The purpose of this sub-section is to build a usability team and for them to apply the methods (Phase 2: Setup) to a set of projects. Table 4.3 lists the steps and step descriptions for the organisation phase of the Schaffer (2004) methodology. The steps include the organisational structure; staffing and projects.

Table 4.3: Schaffer (2004) Methodology – Phase 3: Organisation	
Steps	Description
Organisational Structure	<p>Spread usability consciousness throughout the organisation. In order to succeed, the idea of the importance of usability must permeate the entire organisation's awareness and processes. All organisations need a central usability team. The team is commonly distributed in one of three organisational structures: matrix; centralised and decentralised.</p>
Staffing	<p>The success of the usability effort depends very much on the quality and appropriateness of the staff recruited to do the work. The steps that were completed in the setup phase provide a clear understanding of the types of people needed.</p>
Projects	<p>When the usability staff are in place, usability methods can be applied to a whole set of projects. This gives immediate results and value. Lines-of-business managers will begin, routinely, to look for a UCD process for their projects and they will look for usability practitioners to do the work.</p>

Usability should not reside within a single group; in order to succeed, usability must permeate the entire organisation and become a part of the system (Schaffer, 2004). The UCD lifecycle can assist to define the type of staff required to implement usability activities. After the staff have been appointed, usability activities can be applied to more projects.

4.2.1.4 Long-term Operations

The purpose of the long-term operation phase is for the established, central usability group to have an on-going role in supporting the usability engineering process. Table 4.4 lists steps and step descriptions for the long-term operations phase of the Schaffer (2004) methodology. The steps include maintaining respect; maintaining momentum; evangelising; training; mentoring; supporting standards; supporting the community; usability testing; focusing on metrics; having responsibility and reporting to executives. The usability infrastructure and skills set within the organisation have to be maintained. Usability practitioners should now be involved in all development work, following the UCD lifecycle.

Table 4.4: Schaffer (2004) Methodology – Phase 4: Long-term Operations	
Steps	Description
Maintaining respect	Staff must not be marginalised, ignored or diverted back to a technology focus.
Maintaining momentum	Maintain momentum by planning the work for excitement and visible progress.
Evangelising	Evangelise usability by constantly hosting events to share the lessons learned and convey excitement about the value of usability.
Training	Train new people to keep the knowledge of UCD in the organisation. Enhance and update the skill sets of existing staff.
Mentoring	Mentor the usability staff working for project teams.
Supporting standards	Update the design standard and provide consultation to help developers follow the rules.
Supporting the community	Form a community of interest. Support formal activities, such as information sharing sessions that provide mutual emotional support.
Usability testing	Conduct usability tests objectively as outsiders to a project team.
Focusing on metrics	Measure usability to show that the investment is working and highlight areas for improvement.
Having responsibility	Take responsibility for usability throughout the organisation.
Reporting to executives	Report progress and achievements to executives.

Dr Eric Schaffer, the author of the methodology described above, is the CEO of Human Factors International (HFI). HFI teaches a two-day course, entitled “*How to support institutionalisation of a mature UX practice*” which is based on the work, described above, of Dr Schaffer, (<http://www.humanfactors.com/training/I-19.asp>).

4.2.2 Staggers et al. (2011) Methodology

Staggers et al. (2011) provide initial steps for incorporating usability into US Health Organisations. They state that, despite the benefits and national attention to usability principles and methods in US healthcare projects, individuals may find that their organisations are not attending to usability (Staggers et al., 2011). Therefore, they compiled a list of common methods for launching usability in an organisation (Staggers et al., 2011):

- Wake-up call;
- Individual infiltration methods;
- Finding internal champions;
- Using external experts as catalysts.

Figure 4.2 illustrates the methods as recommended by Staggers et al. (2011) to expand usability within organisations (also referred to as a UX methodology in Staggers et al. (2011)). Figure 4.2 must be interpreted from bottom to the top. The methodology starts with finding the need for usability in an organisation and looking for usability wake-up calls. It terminates with the inclusion of usability in contracts.

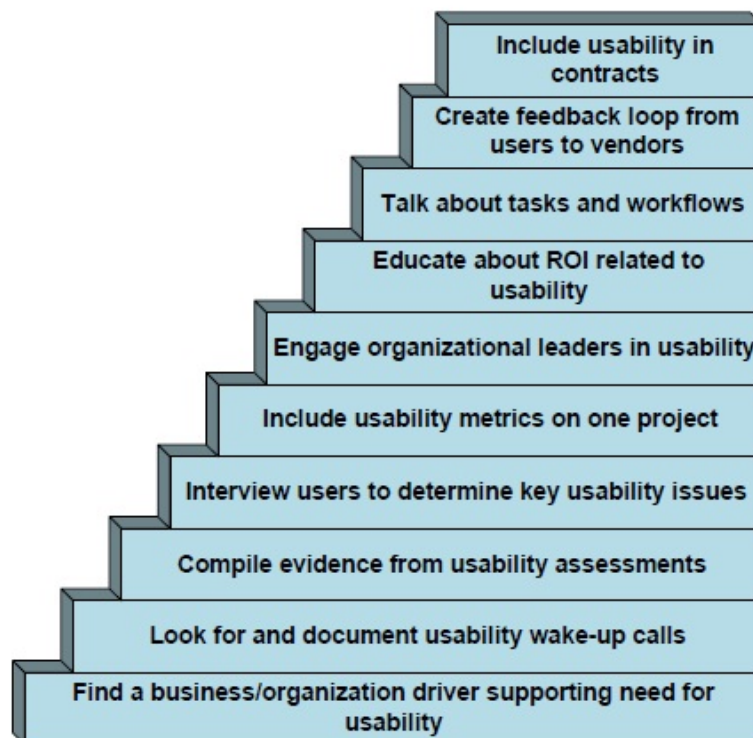


Figure 4.2: Methods to Expand Usability in an Organisation

Source: Staggers et al., 2011: 8.

4.2.3 ISO TR 18529 (2000) Process

Chapter 3 (Section 3.4, Figure 3.5) illustrated that the standards related to usability can be categorised as primarily concerned with: the use of the product; the user interface and interaction; the process used to develop the product and **the capability of an organisation to apply UCD** (Usability Net, 2006a). The focus of this study relates to the latter. ISO TR 18529 (2000), “*Ergonomics of human-system interaction - Human-centred lifecycle process descriptions*” can be used to measure the capability of an organisation to apply UCD (Usability Net, 2006a).

ISO TR 18529 (2000) contains a structured and formalised list of human-centred processes and is summarised in Table 4.5 (Bevan and Bogomolni, 2000; Process for Usability, 2003a; Process for Usability, 2003b; Bevan, 2006; Usability Net, 2006a; Usability Net, 2006b). Seven human-centred design (HCD) processes are listed, together with a description of each process and the practices required for each process. The processes described in Table 4.5 include: ensure HCD content in system strategy; plan and manage the HCD process; specify the user and organisational requirements; understand and specify the context of use; produce design solutions; evaluate designs against requirements and introduce and operate the system.

These base practices describe what has to be done in order to represent and include the users of a system during the UCD lifecycle (Usability Net, 2006b). An organisation can use these processes to identify its capability to apply UCD methods. An organisation needs to assess and identify what processes are relevant to itself (Usability Net, 2006c).

Table 4.5: Human-centred Processes		
Sources: Bevan and Bogomolni, 2000; Process for Usability, 2003a; Process for Usability, 2003b; Bevan, 2006; Usability Net, 2006a; Usability Net, 2006b.		
Process	Description	Practices
HCD.1 Ensure HCD content in system strategy	To establish and maintain a focus on stakeholder and user issues in each part of the organisation which deals with system markets, concept, development and support.	<ul style="list-style-type: none"> • Represent the end-user; • Collect market intelligence; • Define and plan a system strategy; • Collect market feedback; • Analyse trends in users.
HCD.2 Plan and manage the HCD process	To specify how the human-centred activities fit into the whole system lifecycle process and the enterprise.	<ul style="list-style-type: none"> • Consult stakeholders; • Identify and plan user involvement; • Select human-centred methods and techniques; • Ensure a human-centred approach within the project team;

Table 4.5: Human-centred Processes
Sources: Bevan and Bogomolni, 2000; Process for Usability, 2003a; Process for Usability, 2003b; Bevan, 2006; Usability Net, 2006a; Usability Net, 2006b.

Process	Description	Practices
		<ul style="list-style-type: none"> • Plan human-centred design activities; • Manage human-centred activities; • Champion a human-centred approach; • Provide support for human-centred design.
HCD.3 Specify the user and organisational requirements	To establish the requirements of the organisation and other interested parties.	<ul style="list-style-type: none"> • Clarify and document system goals; • Define stakeholders; • Assess risk to stakeholders; • Define the system; • Generate the stakeholder and organisational requirements; • Set quality-in-use objectives.
HCD.4 Understand and specify the context of use	To identify, clarify and record the characteristics of the stakeholders, their tasks and the organisational and physical environment in which the system will operate.	<ul style="list-style-type: none"> • Identify and document users' tasks; • Identify and document significant user attributes; • Identify and document the organisational environment; • Identify and document the technical environment; • Identify and document the physical environment.
HCD.5 Produce design solutions	To create potential design solutions by drawing on established state-of-the-art practice, the experience and knowledge of the participants and the results of the context-of-use analysis.	<ul style="list-style-type: none"> • Allocate functions; • Produce a composite task model; • Explore the system design; • Use existing knowledge to develop design solutions; • Specify the system; • Develop prototypes; • Develop user training; • Develop user support.
HCD.6 Evaluate designs against requirements	To collect feedback on the developing design.	<ul style="list-style-type: none"> • Specify and validate the context of evaluation; • Evaluate early prototypes in order to define requirements for the system; • Evaluate prototypes in order to improve the design; • Evaluate the system in order to check that the system requirements have been met;

Table 4.5: Human-centred Processes		
Sources: Bevan and Bogomolni, 2000; Process for Usability, 2003a; Process for Usability, 2003b; Bevan, 2006; Usability Net, 2006a; Usability Net, 2006b.		
Process	Description	Practices
		<ul style="list-style-type: none"> • Evaluate the system in order to check that the required practice has been followed; • Evaluate the system in use to ensure that it continues to meet organisational and user needs.
HCD.7 Introduce and operate the system	To establish the human-system aspects of the support and implementation of the system.	<ul style="list-style-type: none"> • Management of change; • Determine the impact on the organisation and stakeholders; • Customisation and local design; • Deliver user training; • Support users in planned activities; • Ensure conformance to workplace ergonomic legislation.

4.2.4 Unger and Chandler (2009) Methodology

Unger and Chandler (2009) demonstrate how to integrate UX principles into a project from start to finish. Table 4.6 summarises the methodology proposed by Unger and Chandler (2009) that helps a practitioner to use UX tools and techniques with working teams. The focus is on running UX projects. Implementing successful UX design requires more than knowing the latest Web technologies or design trends (Unger and Chandler, 2009). Diplomacy, project management skills and business experience and knowledge are required. Table 4.6 is explained in terms of the steps and the required sub-steps or practices. The steps include: the project ecosystem; proposal; project objectives and approach; business requirements; user research; search engine optimisation; from define to design; sitemaps and task flows; wireframes and annotations; prototyping; design testing with users and the transition from design to development and beyond.

Table 4.6: Unger and Chandler (2009) Methodology	
Steps	Sub-steps/practices
The Project Ecosystem	Identify the type of site: <ul style="list-style-type: none"> • Brand presence; • Marketing campaign; • Content source; • Task-based applications.
	Identify the roles to be taken during a project: <ul style="list-style-type: none"> • Information architect;

Table 4.6: Unger and Chandler (2009) Methodology	
Steps	Sub-steps/practices
	<ul style="list-style-type: none"> • Interaction designer; • User researcher; • Other roles: <ul style="list-style-type: none"> ○ Brand strategist; ○ Business analyst; ○ Content strategist; ○ Copywriter; ○ Visual designer; ○ Front-end developer. <p>Building a network of user advocacy (Support network – who in the organisation can assist with these tasks?)</p>
	<p>Understand the company culture:</p> <ul style="list-style-type: none"> • History; • Hierarchy; • Logistics.
Proposal (Agreement between vendor and client)	<p>Create the proposal:</p> <ul style="list-style-type: none"> • Title page; revision history; project overview; project approach; scope of work; assumptions; deliverables; ownership and rights; additional costs and fees; project pricing; payment schedule; acknowledgement and sign-off.
Project objectives and approach (Statement of a measurable goal for the project)	<p>Clarify and set project objectives:</p> <ul style="list-style-type: none"> • Identify project objectives; • Understand strengths and weaknesses; • Identify opportunities and threats; • Compare competitors.
	<p>Understand the project approach (overall methodology/lifecycle):</p> <ul style="list-style-type: none"> • Plan; define; design; develop; deploy and extend.
Business requirements	<p>Understand the current state: Heuristic analysis.</p>
	<p>Gather ideas from stakeholders:</p> <ul style="list-style-type: none"> • Outline project team roles and responsibilities; • Gather suitable stakeholders; • Create a plan for meetings and run the meetings efficiently; • Collate requirements.
User research	<p>Define user groups:</p> <ul style="list-style-type: none"> • Define primary user groups; • Plan for user involvement; • Conduct the research (user interviews, contextual enquiry, surveys, focus groups, card sorting, usability testing); • Validate user group definitions; • Generate user requirements; • Personas.
Search engine optimisation (SEO)	<p>Develop and maintain a Web asset with the intention of gaining and keeping top placement on public search engines for specifically targeted</p>

Table 4.6: Unger and Chandler (2009) Methodology	
Steps	Sub-steps/practices
	keyword phrases.
From define to design	Ideate and visualise features: Storyboarding.
	Prioritise project requirements: <ul style="list-style-type: none"> • Level of importance to the business; • Level of importance to the user; • Technical feasibility; • Resource feasibility.
	Plan activities and documentation: <ul style="list-style-type: none"> • How much iteration? • How will collaboration happen? • How will design documentation be shared with the larger team? • How much detail will the design have? • How long will the documents need to “live”? • Who are the primary users of each type of documentation? • With what other types of documentation must there be alignment? • What are the timelines? • What additional factors will affect the timing of the documents? • Will multiple designers be used and, if so, how will the work be apportioned?
Sitemaps and task flows	Identify the structure of websites and applications. Task flows take sitemaps a step further by identifying the various courses of action that a user may traverse within a section of the site.
Wireframes and annotations	Identify the elements that will be displayed: navigation, content sections, imagery, form elements, calls to action and low-fidelity prototypes. Annotations are explanations and note an element or an interaction on a wireframe.
Prototyping	Create and test all or part of the functionality of an application or website with users. Prototypes can be made with analogue tools (whiteboards, pencil and paper) or digitally (PowerPoint, Visio, HTML).
Design testing with users	Concept exploration.
	Usability testing.
Transition: from design to development and beyond	Visual design.
	Development.
	Quality assurance.
	Design testing with users (again).
	Launch: <ul style="list-style-type: none"> • Personal advantage (marketing to tailor the message towards users); • Support; • Network opinion.
	Post-launch: <ul style="list-style-type: none"> • Analytics; • Design testing with users (again); • Iterations.

Unger and Chandler (2009) state that this is not the only or perfect methodology to follow and no one has all the answers. They further state that trial and error, enhancements and improvements and feedback from others, will help an organisation to tailor a process that fits its needs. This statement is a motivation that South African PGs need their own tailored process.

4.2.5 Usability.gov (2012c) Methodology

In the United States, the federal government is the largest single producer, collector, consumer and disseminator of information (Usability.gov, 2012a). Usability.gov (www.usability.gov) is an American Government website that is the primary government source for information on usability and UCD. It provides guidance, tools, templates, methods and resources on how to make websites and other communication systems more usable and useful. The methods, as illustrated by Usability.gov (2012c), are explained in Table 4.7.

The main steps listed in Table 4.7 include: buy-in; plan the project; analyse the current site; design the new site; test and refine the site and other important aspects to consider (such as templates, best practices, training and laws). Each main step describes the necessary sub-steps/practices required to complete that step. In order to institutionalise usability into an organisation and to achieve buy-in, the following approaches have to be considered (Usability.gov, 2012a):

- Change the mindset of management from considering usability as an extra step to understanding the return on investment;
- Identify someone who can be educated about usability and its importance to meeting business goals and objectives. The more knowledge there is about an agency's business goals and needs, the easier it will be to sell usability and its impact;
- Invite colleagues and companies who are already employing usability at their agencies to present its impact to management. Many agencies investing in usability have success stories and data to show dramatic improvements in website design. Sharing video footage of usability tests demonstrates the value of users' experiences on a website;
- Encourage management to observe usability testing. Observation of user behaviour is very persuasive. The user perspective is just about impossible for website production teams and content developers to see without talking to or observing actual users;
- Remind decision-makers that usability testing does not have to be expensive. Big problems latent in the design are obvious after just a few user tests;

- Emphasise that the e-Government Act and the President's Management Agenda require agencies to ensure that their e-Government information and services are citizen-centric and measurable. This is mandatory in the United States but is not standardised in South Africa.

Figure 4.3 illustrates the remaining steps as listed in Table 4.7 (Usability.gov, 2012d). Figure 4.3 consists of the following main steps: plan; analyse; design; test and refine. Project planning is critical because it helps to focus the objectives and to plan for usability activities that are part of the process of developing a successful website. The goal of the analysis step is to learn as much as possible about the users of the website and their tasks. Requirements for the features, functions and content of the website should be already decided when the website is ready to be designed. Usability testing should be done throughout the website design (old site, low/high fidelity prototypes) and development in order to refine the website.

Each main step (Table 4.7, Figure 4.3) has sub-steps which are required to complete a relevant step. The step-by-step usability guide (Figure 4.3) is illustrated on the Usability.gov website (www.usability.gov) where each block in the figure is clickable, taking the user to more information about that step (Usability.gov, 2012d). The detailed information about each step was investigated and summarised in Table 4.7.

Table 4.7: Usability.gov (2012c) Methodology	
Steps	Sub-steps/Practices
Buy-in	Change mindset of management.
	Identify an executive champion.
	Show success stories and improvements (internal or external companies).
	Encourage management to observe usability testing.
	Price does not have to be expensive.
	Focus on e-Government act.
Plan the project	Develop a plan: <ul style="list-style-type: none"> • Create a plan; Determine project scope; Identify user audience; Set business objectives.
	Assemble a project team: <ul style="list-style-type: none"> • Project Manager; Usability Specialists; Content Writers; Information Architects; Graphic Designers; Developers/Programmers; Subject Matter Specialists. If the team is not internal: <ul style="list-style-type: none"> • Write a statement of work; Hire a usability specialist.
	Kick-off meeting:

Table 4.7: Usability.gov (2012c) Methodology	
Steps	Sub-steps/Practices
	<ul style="list-style-type: none"> Who do team members think of as the user audience; What do team members think are the users' main scenarios; How well do the team members think the current site meets the audience's needs.
Analyse current site	Evaluate current site. Review against how the site meets: <ul style="list-style-type: none"> Organisations objectives; Usability goals; User's needs; Basic Web guidelines.
	Learn about and understand the users: <ul style="list-style-type: none"> Information needs and levels of knowledge about the subject matter; Ways of thinking about grouping and organising information; Expectations about the site; Levels of experience with the Web and similar types of sites; Ways of working with information; Technology which is available (Internet access, devices, physical environment); Techniques (usability testing, contextual interviews, surveys, individual interviews, focus groups, card sorting).
	Task analysis: Involves learning about users' goals, what users want to do on the website and how users work.
	Personas: A fictional person who represents a major user group for the site.
	Scenarios: A short story about a specific user with a specific goal at a site.
	Measurable usability goals: Time; accuracy; overall success and satisfaction.
Design new site	Requirements: Describe the features, functions and content of the site.
	Content Inventory: A list of all the content on a site.
	Card sorting: Participants review items from a website and then group these items into categories.
	Information architecture: Organise and label websites.
	Creating use cases: Description of how users will perform tasks on a website.
	Writing for the Web: A successful website has the information that users need in the place they look for it, in the amount they want to deal with, in words and pictures that make sense to them.
	Parallel design: Several people create an initial design from the same set of requirements. Each person works independently and when finished, shares his/her concepts with the group.
	Prototypes: A draft version of a website.
	Launching the site: Programming and accessibility.
Test and refine the site	Evaluate the site: <ul style="list-style-type: none"> Usability evaluations without users (observational evaluations, guideline-based reviews, cognitive walkthroughs, expert reviews, heuristic evaluations); Usability tests with users (usability testing, interviews).
	Implement recommendations.
	Retest.
Other	Templates and examples: Templates can minimise rework and enforce consistency.
	Best practices and guidelines: Take advantage of what is already known about best practices for each step of the process.

Table 4.7: Usability.gov (2012c) Methodology	
Steps	Sub-steps/Practices
	Training and workshops.
	Federal laws and regulations: In the United States, laws exist regarding accessibility requirements.

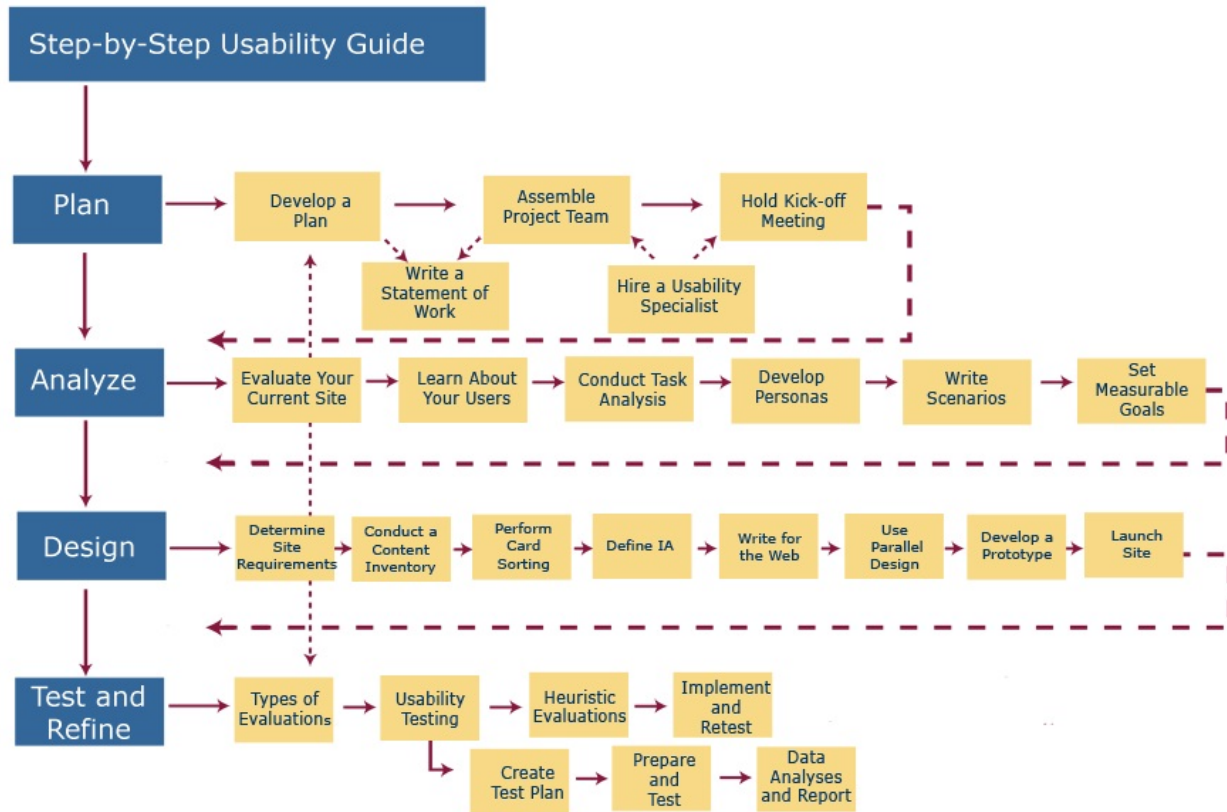


Figure 4.3: Step-by-step Usability Guide

Source: Usability.gov, 2012d: 1.

This section investigated five methodologies for the institutionalisation of UX. Section 4.4 will combine and restructure these UX methodologies, in order to propose one methodology (IUXG methodology 1.0), containing integrated steps and processes (listed above). The proposed methodology will also comprise UX institutionalisation best practices, discussed in the following section.

4.3 Institutionalising User Experience: Best Practices

Lessons learnt from international studies, where UX was embedded in large organisations, are described in this section. The research discussed in this section is not detailed methodologies for

institutionalising UX, but rather best practices and lessons learnt. The UX best practices identified in this section are referred to as usability and UX best practices by the respective authors.

Nall (2004) describes the core elements that helped to institutionalise usability in the National Cancer Institute in the Health sector (United States):

1. *Involve the leadership* through presentations, participation in testing or showing management the results of a usable site versus a non-usable site;
2. *Use the language* from leaders driving the new trend to e-Government;
3. *Training*;
4. *Awareness* through the online publication received by federal staff. By means of this method information is shared and people are encouraged to share lessons learnt.

It is impossible to take a company immediately from UX indifference to UX maturity, as the demands are too disruptive (Ide-Smith, 2011a). A company must convince and motivate for the need of UX through small projects and victories. Ide-Smith (2011a) lists the following lessons learnt in order to embed UX in a large public sector organisation:

- Start with small but perfectly formed projects. Demonstrate the value of using UX methods, regardless of how small a project is;
- Use data (usability testing, customer feedback, analytics) to tell a story about the users. This is particularly useful when dealing with strongly opinionated stakeholders;
- Highlighting poor design and content require tact and diplomacy. Use familiar language and always point out something positive as well as the negatives;
- Find a UX champion who can gain organisational support and resources;
- When using external expertise, find a supplier who will work collaboratively and help to transfer skills to in-house teams;
- The whole team can learn UX skills;
- Regular usability testing is an invaluable way to get early feedback on designs; however, recruiting users can be time consuming and expensive. Maximise opportunities to recruit users, for example, by adding a check box (option to be available for usability testing) on customer surveys and feedback forms;
- Sell the value of UX by setting targets and evaluating benchmarks by using consistent metrics;

- UX staff should influence all areas of the business that impacts on customers. Speak to customer support to understand customer problems. Integrate usability evaluations into procurement;
- Standardising processes and templates saves time and helps with a UX roll out. UX processes were integrated into Agile (scrum) processes. Leave room to experiment with new techniques;
- UX is a full-time job if it is to be implemented successfully;
- Work with data experts (market researchers or data analysts) to segment customers and help to create personas, to enable everyone in the organisation to know its users.

In order to be successful, a UX design process needs to consider (Jorge, 2012):

- A company's purpose (it is important to identify the stakeholders who are participants in the design process);
- A product team's skills;
- Users' expectations and goals.

These factors are crucial to take into consideration as UX methods and tools alone will not make an organisation's UX successful (Jorge, 2012).

Travis (2005) uses the acronym, START to demonstrate techniques to institutionalise usability in organisations:

- *Think Strategically*: Focus on key projects by answering these questions:
 - How important is good usability to this project?
 - How important is the project within the organisation?
 - Can the project be used to measure the before and after benefits of usability?
 - How supportive is the project manager of UCD?
- *Recruit a Top-level champion*: The implementation of UCD has ramifications throughout the organisation; therefore board level support is required to implement such a fundamental change;
- *Raise Awareness*: Organisational change is most effective when other people are empowered to implement it;
- *Demonstrate Return on Investment (ROI)*: Collect *before* and *after* ROI data to show the demonstrable benefits of the usability team's involvement;

- *Talk the appropriate language:* Senior managers often become engaged and committed after they see a highlights video.

Projects where a design team wants the usability team to approve a design, without user involvement, must be avoided (Travis, 2005). When the team is approached for usability testing, it is fiscally irresponsible to conduct a usability test if the schedule does not include time to revise the design (Travis, 2005).

The following is a list of top ten best practices for government websites (Howto.gov, 2012b):

1. Meet all laws, requirements, policies and directives for government public websites;
2. Document and follow a Web governance plan;
3. Implement a content strategy;
4. Focus on top tasks;
5. Collaborate across agencies and within the organisation's agency to avoid duplication;
6. Regularly conduct usability testing with actual users;
7. Use performance metrics (not opinion) to influence design and drive improvements;
8. Make sure that people can find a site's most important content by using search;
9. Engage customers to create a two-way dialogue;
10. Stay current with the latest research and best practices.

Staying current with the latest research and best practices, is listed as a best practice above (Howto.gov, 2012b). UX practitioners need to be able to spot trends that are currently happening in the world and then make sense of those trends (Chavan, 2012). Trends in UX and e-Government will be explored in more detail in Chapter 6. The next Section (4.4) will use the information from Sections 4.2 and 4.3 to propose a methodology for institutionalising UX.

4.4 User Experience Institutionalisation: Proposed IUXG Methodology

The goal of this section is to propose the initial IUXG methodology (IUXG methodology 1.0). Section 4.2 investigated the steps and processes of five UX institutionalisation methodologies. Section 4.3 described best practices and lessons learnt for institutionalising UX. The proposed IUXG methodology was formed by combining and structuring the literature from Section 4.2 and Section 4.3 into one proposed (IUXG) methodology for institutionalising UX in an organisation.

The UX methodologies and best practices were grouped into a matrix where common themes, phases, steps and sub-steps were identified.

The five methodologies investigated in Section 4.2 did not have similar main phases and one methodology (Staggers et al., 2011) did not have any main phases at all. Based on the overlapping themes, the initial proposed IUXG methodology, derived from the five methodologies, has the following six main phases:

- Phase A: Startup;
- Phase B: Setup;
- Phase C: Organisation;
- Phase D: Method;
- Phase E: Standards;
- Phase F: Long-term.

These main phases of the proposed methodology are explained in the following sub-sections. The IUXG methodology process is explained in terms of phases, steps and sub-steps. For example:

- **Phase A: Startup.** The main components (Phase A, Phase B, etc.) are referred to as phases;
- Phase A: Startup: **Measure UX maturity level.** These components are referred to as steps;
- Phase A: Startup: Measure UX maturity level: **Select a maturity model.** These components are referred to as sub-steps.

Each main step consists of several sub-steps (also based on the five methodologies examined in Section 4.2 and the best practices described in Section 4.3). The proposed IUXG methodology (IUXG methodology 1.0) will be updated in Chapter 6 (IUXG methodology 1.1), after considering specific Western Cape Government aspects. The IUXG methodology will also be updated in Chapter 8 (IUXG methodology 2.0), after lessons learnt from the case study.

4.4.1 Phase A: Startup

The focus of the startup phase is to focus attention to the issue of UX in order to start a UX initiative. The institutionalisation of UX starts with a wake-up call (Schaffer, 2004). The wake-up call must lead to an executive champion taking ownership, to provide direction, resources and focus on UX (ISO TR 18529, 2000; Schaffer, 2004; Travis, 2005; Ide-Smith, 2011a; Staggers et al., 2011; Usability.gov, 2012c).

A UX consultant must be procured to kick-start the institutionalisation process (Schaffer, 2004). The company culture must be understood; understanding how a project team has reached its current state can help understanding of the potential challenges in the process (Unger and Chandler, 2009; Jorge, 2012). Further, organisation and staff buy-in are required to make UX institutionalisation a success (Nall, 2004; Travis, 2005; Rhodes, 2009; Staggers et al., 2011; Usability.gov, 2012c; Usability.gov, 2012a).

The startup phase consists of the following steps:

- **A1. Measure the UX maturity level of the organisation** (Schaffer, 2004; Nielsen, 2006; Feijo, 2010):
 - *Description:* UX maturity models allow an organisation to measure its current status and to identify the status at which it wishes to be.
 - *What to do:*
 - Select a maturity model (Chapter 3, Section 3.4);
 - Measure the level of UX maturity in the organisation.

- **A2. Measure the usability of the current site** (ISO TR 18529, 2000; Usability.gov, 2012c; Howto.gov, 2012b):
 - *Description:* Conduct an initial usability test to measure the usability of the current site. Usability is an indicator of the UX that a website will deliver. A usability specialist will be required to conduct this evaluation. A heuristic evaluation is a cheaper option and will provide great results.
 - *What to do:*
 - *Evaluate the site.* Available techniques include usability evaluations without users (observational evaluations, guideline based reviews, cognitive walkthroughs, expert reviews, heuristic evaluations) and usability evaluation with actual users (usability testing, eye tracking, interviews, focus groups).

- **A3. Initialise a wake-up call** (Schaffer, 2004; Travis, 2005; Staggers et al., 2011):
 - *Description:* The attention of the organisation needs to move towards the issue of UX. The wake-up call is not complete until there is an executive champion (discussed in the next point) who arises to manage the overall institutionalisation of UX.

- *What to do:*
 - Investigate and document other UX wake-up calls. Types of wake-up calls include: train wrecks; executive insights; new staff; education; expert reviews; usability testing and new technologies. Dissect a product or a project that failed because user requirements were not considered. Explain how usability testing could have saved the company its embarrassment;
 - Present the results of UX maturity level, usability testing and other wake-up calls to management.

- **A4. Acquire an executive champion** (ISO TR 18529, 2000; Schaffer, 2004; Travis, 2005; Ide-Smith, 2011a; Stagers et al., 2011; Usability.gov, 2012c):
 - *Description:* The implementation of UCD has ramifications throughout the organisation; therefore board level support is required to implement such a fundamental change. The wake-up call, discussed above, must lead to an executive champion.
 - *What to do:*
 - Find a UX champion who can gain organisational support and resources.

- **A5. Procure a UX consultant** (Schaffer, 2004):
 - *Description:* Outside consultants are important to UX institutionalisation, as they can conduct tasks that insiders would not yet have the knowledge or skills to perform.
 - *What to do:*
 - Procure a UX consultant early in the process to provide infrastructure and jump-start the institutionalisation process.

- **A6. Understand the company culture** (Unger and Chandler, 2009; Jorge, 2012):
 - *Description:* A company culture may not be consistent across all of its regions, business units or departments, but key characteristics can usually be identified that will affect the undertaken projects.
 - *What to do:*
 - Investigate the following aspects of the company: history, company purpose, hierarchy and logistics.

- **A7. Obtain buy-in** (Nall, 2004; Travis, 2005; Rhodes, 2009; Staggers et al., 2011; Usability.gov, 2012c; Usability.gov, 2012a):
 - *Description:* In order to truly institutionalise UX into an organisation and to ensure that it is not an afterthought, organisation and staff buy-in is required.
 - *What to do:*
 - Change the mindset of management: engage organisational leaders in usability; play usability test footage showing vocal key customers struggling with a poor website; demonstrate return on investment (ROI) and encourage management to observe usability testing;
 - Show success stories and improvements: internal or external companies (external expert as catalyst) can be used to achieve this;
 - Focus on the e-Government act: use the language from leaders driving the new trend to e-Government. This step is taken from the literature provided by Usability.gov (2012c). This step can be removed for non-government websites.

Figure 4.10, the initial proposed methodology for institutionalising UX, includes the startup steps as Phase A. The startup phase steps, described above, are summarised in Figure 4.4.

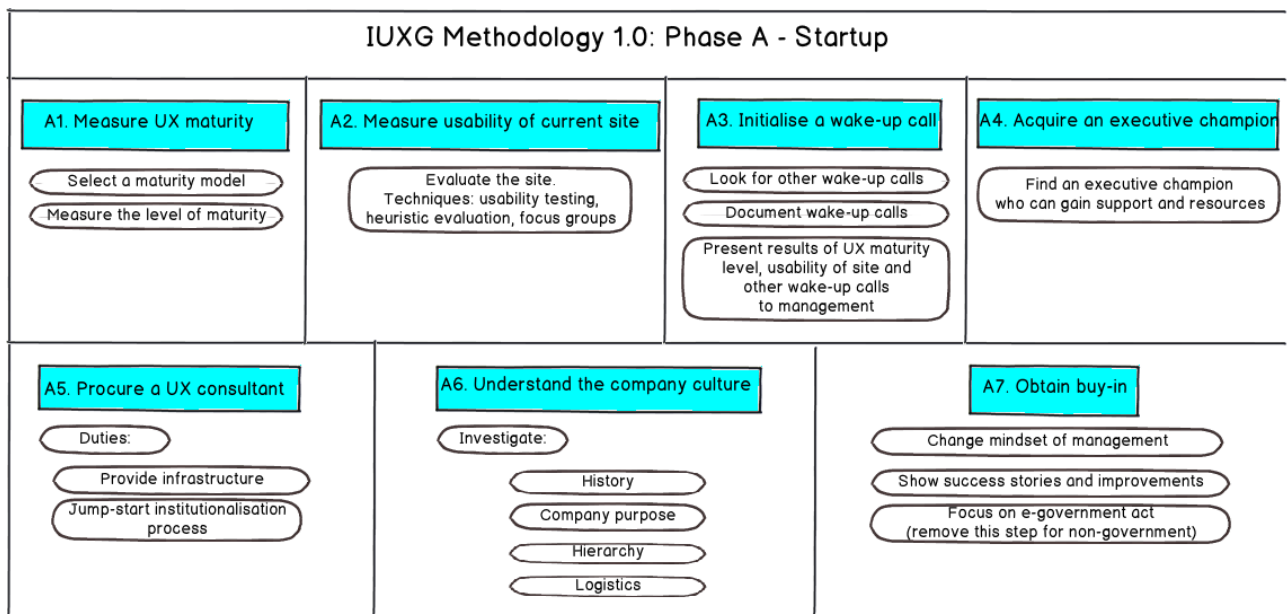


Figure 4.4: Proposed IUXG Methodology 1.0: Phase A - Startup

4.4.2 Phase B: Setup

The focus of the setup phase is to establish the infrastructure required to conduct efficient and professional UX work (Schaffer, 2004). UX methods and techniques must be selected to develop the UCD process. Staff must undertake UX training; however, UX contractors may be used at first, while UX is being institutionalised. The skills of the UX contractors must be transferred to the internal UX team.

The setup phase consists of the following steps:

- **B1. Create a strategy** (ISO TR 18529, 2000; Schaffer, 2004; Howto.gov, 2012b):
 - *Description:* Strategic plans should be concise and written for a wide audience. The strategy essentially describes duties in an organisation and who will be responsible.
 - *What to do:*
 - A strategic plan needs to be created that outlines specific steps, resources and staff responsibilities.

- **B2. Select UX methods** (ISO TR 18529, 2000):
 - *Description:* Several UX methods exist, each with an appropriate outcome in the UCD process. The suggested approach is to first identify the necessary UCD activities and then select the most appropriate methods based on the design and organisational context.
 - *What to do:*
 - A selection of UX methods include: focus groups; heuristic evaluations; cognitive walkthroughs; card sorting; interviews; surveys; questionnaires; wireframes and usability testing. A list of available UX methods is available at: www.usability.gov/methods/index.html and www.usabilitynet.org/tools/list.htm.

- **B3. Define general UCD approach** (ISO TR 18529, 2000; Schaffer, 2004):
 - *Description:* To specify how UX activities fit into the whole system lifecycle process and the enterprise. Leave room to experiment with new techniques such as Agile (scrum) processes. A showcase project can be used to “*test flight*” the new usability engineering infrastructure. This project offers an opportunity to refine the methodology. UCD was defined in Chapter 3.

- *What to do:*
 - UCD lifecycles were illustrated in Chapter 3. Customise a UCD lifecycle to fit an organisation's needs.
- **B4. Conduct training** (Schaffer, 2004):
 - *Description:* Training is an effective way to promote UX and to ensure that key staff members have the required skills.
 - *What to do:*
 - Knowledge training: Educate staff members about the importance of the process of UX;
 - Skills training: Select and train staff members who will be conducting interface design work. Aim for certification for the most highly trained staff members.

Figure 4.10, the initial proposed methodology for institutionalising UX, includes the setup steps as Phase B. The setup phase steps, described above, are summarised in Figure 4.5.

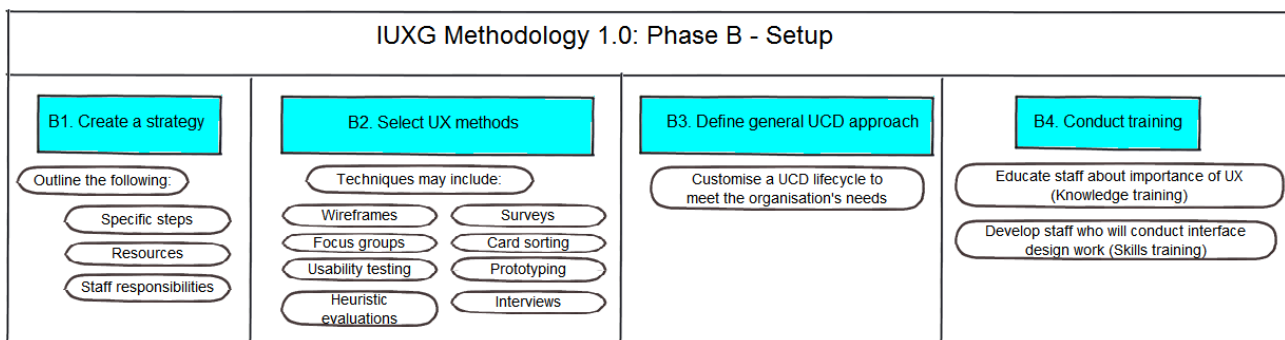


Figure 4.5: Proposed IUXG Methodology 1.0: Phase B - Setup

4.4.3 Phase C: Organisation

After a proper infrastructure and a full understanding of the organisation's needs are in place, a usability team can be built (Schaffer, 2004). The organisation phase consists of the organisational structure, UX staffing, as well as other crucial staff members outside the UX team.

The Organisation phase consists of the following steps:

- **C1. Define the UX organisational structure** (Schaffer, 2004):
 - *Description:* A central UX team is required.

- *What to do:*
 - Three types of organisational structures are commonly considered for the permanent UX team:
 - *Matrix:* A central UX group, but this group does not do all the work. The central group also supports UX practitioners working with different project teams (medium and large organisations);
 - *Centralised:* All UX staff members are in a single team and are assigned temporarily to help on specific projects as required (small organisations);
 - *Decentralised:* UX staff members are allocated to specific projects and report upwards through the various levels of responsibility of business (not recommended by Schaffer (2004)).

- **C2. Define and recruit UX staff – usability and UX team roles** (Schaffer, 2004; Unger and Chandler, 2009; Ide-Smith, 2011a):
 - *Description:* The success of the UX effort depends very much on the quality and suitability of the staff recruited to do the work. The steps that were completed in the setup phase provide a clear understanding of the types of people needed.
 - *What to do (the following roles are required):*
 - *Information Architect:* This specialist creates models for information structure and uses them to design user-friendly navigation and content categorisation. Common activities include creating detailed sitemaps and ensuring that categories and sub-categories of information are distinct and user-friendly;
 - *Interaction Designer:* This designer defines the behaviour of a website/application in accordance with user actions. Common activities include creating task flows showing interactions across pages or components within the website and creating wireframes showing in-page interactions;
 - *User Researcher:* This researcher provides insights regarding the needs of end users, based on information that is generated from, or validated by, the research that person conducts with users. Common activities may include user interviews, surveys and usability testing;

- *Graphic Designer*: This designer is responsible for the elements of the website/application that the user sees. Graphic Designers help to create visually appealing designs that enhance the usability of a website.
- **C3. Support required from other staff** (Unger and Chandler, 2009):
 - *Description*: Several roles do not typically fall under the role of a UX designer, but their responsibilities often overlap.
 - *What to do (the following roles are required)*:
 - *Brand Strategist*: The Brand Strategist builds relationships with key markets through the definition and consistent representation of the company's branding elements. The role often entails creating or presenting branding guidelines and understanding how they apply to different projects;
 - *Business Analyst*: The Business Analyst is responsible for identifying key business stakeholders, driving the requirements gathering process and serving as the primary liaison between business stakeholders and the technology team. The business analyst is the primary owner of detailed requirements documentation, such as functional specification and use cases;
 - *Content Strategist*: The Content Strategist is responsible for understanding business and user requirements for content to be placed in various media. This staff member identifies the gaps in existing content and facilitates the workflow and development of new content;
 - *Copy/Content Writers*: Writers and Editors who are skilled in writing for the Web can help to create usable, useful content for the website;
 - *Project Manager*: A skilled manager who can actively lead and manage a complex project;
 - *Developers/Programmers*: A team of developers can manage the technical aspects of a website including programming of the site. These developers must include people who know how to develop accessible webpages and maintain a content management system;
 - *Subject Matter Specialists*: People who are familiar with the topics on the website to provide information for the website. If they are not trained in writing for the Web, they can work with content writers and editors so that

the information on the website is accurate, up-to-date and easy for users to read and understand.

- **C4. Using contractors** (Ide-Smith, 2011a; Staggers et al., 2011; Usability.gov, 2012c):
 - *Description:* When using external expertise, find a supplier who will work collaboratively and help to transfer skills to in-house teams.
 - *What to do:*
 - Have a statement of work written for the UX contractor;
 - Work collaboratively;
 - Transfer skills to in-house teams.

Figure 4.10, the initial proposed methodology for institutionalising UX, includes the organisation steps as Phase C. The organisation phase steps, described above, are summarised in Figure 4.6.

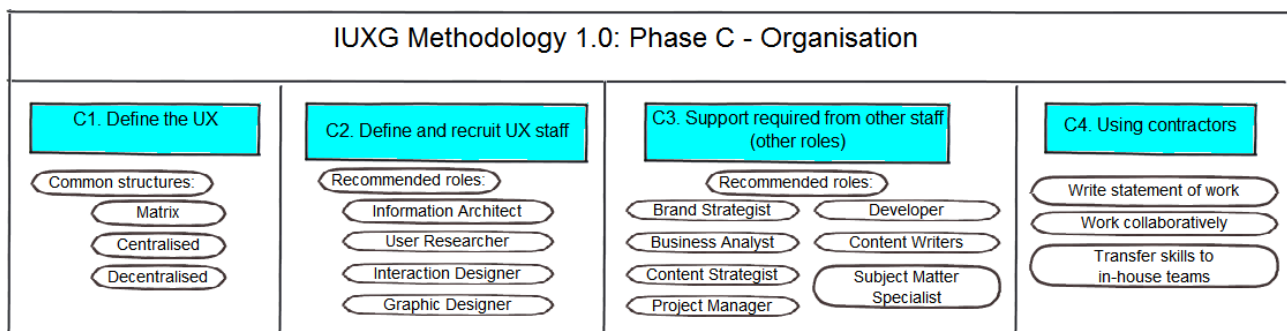


Figure 4.6: Proposed IUXG Methodology 1.0: Phase C - Organisation

4.4.4 Phase D: Method

The method phase is crucial for beginning and developing a UX project. The need for UX work has to be determined at the start of a new project (Travis, 2005). The requirement of UX may depend on the importance of the project within the organisation, the support from the rest of the project team, as well as sufficient time to implement recommendations. The next step is to identify the type of site (Unger and Chandler, 2009). Important to this phase of the methodology, is the written proposal and agreement of work to be done between the parties (Unger and Chandler, 2009). When consensus has been reached, the project can be planned. Business requirements and user research are needed in order to start site design. The site must be tested and refined before it is launched. After the site has been launched, support has to be given to maintain the live site.

The method phase consists of the following steps:

- **D1. Determine the need for UX** (Travis, 2005):
 - *Description:* The need for UX needs to be determined for each project. It is fiscally irresponsible to conduct usability testing if the schedule does not include time to revise the design. Avoid projects where the goal is simply for the UX team to accept the design without discussion.
 - *What to do:*
 - The organisation must answer the following questions:
 - Is the project important within the organisation?
 - Is UX important to this project?
 - Can the project be used to measure the before and after benefits of UX?
 - Does the project manager support UCD?
 - Does the schedule allow time to revise the design?
 - If the answers to these questions are “yes”, the project can be initiated.
 - User involvement is essential.
- **D2. Identify the type of site** (Unger and Chandler, 2009):
 - *Description:* Although no black-and-white distinctions exist between one type of site and another, there are differences in site focus and characteristics. Understanding the similarities and differences can assist to: set design goals; solidify the primary objectives; understand what stakeholders should be involved; determine the best methods to incorporate user research and to ask questions about which systems and technologies may be involved.
 - *What to do:*
 - Identify the website from these typical websites:
 - *Brand presence:* A constantly present online platform that facilitates the relationship between a company and a general audience;
 - *Marketing campaign:* A targeted site intended to elicit a specific and measurable response from a particular audience or from a general audience over a limited period of time;

- *Content source*: A store of information intended to inform, engage or entertain users;
 - *Task-based applications*: A tool designed to allow users to accomplish a set of key tasks or workflows.

- **D3. Create a proposal** (Unger and Chandler, 2009):
 - *Description*: A proposal is a written contract between the UX team and an organisation that clearly defines the required work. A comprehensive written contract is the best defence and the smartest way to ensure that there are no disagreements, financial or legal troubles later in the project.
 - *What to do*:
 - The proposal needs the following elements: title page; revision history; project overview; project approach; scope of work; assumptions; deliverables; ownership and rights; additional costs and fees; project pricing; payment schedule; acknowledgement and sign-off.

- **D4. Plan the project** (ISO TR 18529, 2000; Unger and Chandler, 2009; Usability.gov, 2012c; Jorge, 2012):
 - *Description*: The key to a good project is to start with clear project objectives and a well understood approach.
 - *What to do*:
 - Determine the project objectives and approach: solidify project objectives and understand the project approach (overall methodology/lifecycle);
 - Determine the project scope;
 - Prioritise project requirements: the level of importance to the business; the level of importance to the user; technical feasibility; resource feasibility;
 - Assemble a project team: It is important to have the correct skill sets available;
 - Plan UX activities and documentation;
 - Document the plan.

- **D5. Develop business requirements** (ISO TR 18529, 2000; International Institute of Business Analysis, 2006; Unger and Chandler, 2009; Ide-Smith, 2011a; Usability.gov, 2012c; Howto.gov, 2012b):
 - *Description:* Business requirements are high-level statements of the goals, objectives or needs of the enterprise. The requirements describe why a project is initiated, what the project will achieve and the metrics that will be used to measure its success.
 - *What to do:*
 - *Understand the current site* (if applicable): conduct a heuristic evaluation, reviewing how the site measures against the organisation's objectives, usability goals, user's needs and basic Web guidelines;
 - *Gather ideas from stakeholders:* outline project team roles and responsibilities; define the stakeholders; create a plan for meetings and run the meetings efficiently; collate requirements; gather team members' ideas regarding the user audience, the user's main scenarios and how well the current site meets the user needs;
 - *Collaborate across agencies* and within the organisation's own agency to avoid duplication;
 - *Identify other business requirements:* assess the risk to stakeholders; define the system to use; identify and document the organisational environment; identify and document the technical environment and identify and document the physical environment.

- **D6. Conduct user research** (ISO TR 18529, 2000; Ide-Smith, 2011a; Usability.gov, 2012c; Jorge, 2012):
 - *Description:* Knowledge about the intended users of a site is required in order to design that site in a UX perspective. To be successful, a UX process needs to consider user expectations and goals.
 - *What to do:*
 - Learn about the users:
 - What information and levels of knowledge about the subject matter are required?
 - Ways of working, planning, grouping and organising information;
 - Expectations about the site;

- Levels of experience with the Web and similar types of sites;
 - Technology available to the potential users (Internet access, devices, physical environment);
 - Consult customer support to understand customer problems;
 - Techniques that are available include: usability testing, contextual interviews, surveys, individual interviews, focus groups and card sorting;
 - Collect analytics/trends about the website.
 - Define user groups:
 - Define the primary user groups;
 - Validate user group definitions;
 - Generate user requirements;
 - Create personas.
- **D7. Design the site** (ISO TR 18529, 2000; Unger and Chandler, 2009; Staggers et al., 2011; Usability.gov, 2012c; Elsevier, 2012; Howto.gov, 2012b):
 - *Description:* When designing the site, requirements should be decided beforehand for features, functions and content of the site. The requirements and content help to design prototypes. The prototypes are evaluated and user feedback is collected. Next, the site is designed, including visual design and HTML. Evaluation and implementation then takes place in an iterative fashion. Accessibility guidelines must be implemented during these iterations.
 - *What to do:*
 - *Collect requirements:*
 - Collect the business requirements (as above);
 - Collect the user research/requirements (as above);
 - Obtain content inventory (a list of all the content on a site).
 - *Implement a content strategy.* A content strategy refers to the planning, development, and management of website content;
 - *Identify and document user tasks and workflows.* Available techniques include task analysis, scenarios, and use cases. Focus on top tasks;
 - *Determine site structure and navigation.* Available techniques include card sorting, sitemap, information architecture and wireframes;

- *Conduct search engine optimisation (SEO)*. Webpages should contain the details which search engines seek, to advance webpages in search results without the website owner having to pay for this ranking. This can be achieved by making good use of keywords; having an effective site structure; having a process for indexing a site; ensuring quality links and link popularity and managing search during and after a website redesign;
 - *Develop prototypes*. A prototype is a draft version of a website. Allow for the exploration of ideas before investing time and money into development;
 - *Collect user feedback*. Available techniques include surveys, questionnaires, usability testing, focus groups and interviews;
 - *Design the site*. The design consists of visual design and HTML prototyping. Visual design creates a detailed appearance by describing the colours, graphics, typography and screen layout of the user interface. HTML prototyping creates a standalone website/application that mimics the look and feel of the actual product, although it has limited functionality;
 - *Evaluate the site*. Available techniques include usability evaluations without users (observational evaluations, guideline based reviews, cognitive walkthroughs, expert reviews, heuristic evaluations) and usability evaluation with actual users (usability testing, eye tracking, interviews);
 - *Develop the site*. Development/programming can begin when webpage designs, information architecture, navigation menu and content are ready;
 - The specific details of the development step are beyond the focus of this study;
 - *Implement accessibility guidelines*. The World Wide Web Consortium (1999) has international accessibility guidelines that should be followed.
- **D8. Test and refine the site** (ISO TR 18529, 2000; Usability.gov, 2012c; Howto.gov, 2012b):
 - *Description*: Evaluate the site to ensure that it continues to meet organisational and user needs.
 - *What to do*:
 - Evaluate the site (as above);

- Implement recommendations. The development team must implement the recommendations from the usability evaluations;
 - Retest. The site should be retested until usability goals are achieved.
- **D9. Launch the site** (Munroe, 2009; Unger and Chandler, 2009; Gube, 2010; Usability.gov, 2012c):
 - *Description:* Once the site has been designed, developed and tested, it can be made public.
 - *What to do:*
 - Create and establish the required social media accounts beforehand;
 - Do cross-browser checks. It is important that a site works across all browsers and that users do not encounter any problems. Nielsen and Loranger (2006) recommend use of the five to six year rule to guide when support of older browsers should stop. There should be a waiting period of five to six years after the launch of a new browser version before stopping support for the previous one. For example: Internet Explorer 6 was launched in 2001; hence the process of ignoring Internet Explorer 5 could begin in 2007. Internet Explorer 7 was introduced in 2006; hence Internet Explorer 6 needs to be supported until 2012;
 - Proofread existing content;
 - Create a content plan. Have new content ready for at least a month;
 - Market the upcoming launch;
 - Plan design and implementation tasks for after the launch;
 - Check the technical details before going live. For example, check that all hyperlinks are working;
 - Launch on schedule.
- **D10. Deliver support after the launch** (ISO TR 18529, 2000; Unger and Chandler, 2009; Mashapa, van Greunen and Veldsman, 2011):
 - *Description:* The necessary support needs to be provided for the live system. These activities are not necessarily activities to be conducted by a UX team, but are necessary in the process.

- *What to do:*
 - Implement change management. Change management is the process, tools and techniques to manage the people-side of change to achieve the required business outcomes in the relevant context while not discarding user participation;
 - User training. Certain systems/websites may require users to be trained;
 - Provide customer support. Customer support, such as telephone, e-mail or online support needs to be provided;
 - Determine impact on organisation and stakeholders;
 - Collect analytics. Website analytics give insight into the users of the site (see Phase F: Long-term: metrics);
 - Work through iterations (design and implementation tasks).

Figure 4.10, the initial proposed methodology for institutionalising UX, includes the method steps as Phase D. The organisation method steps, described above, are summarised in Figure 4.7.

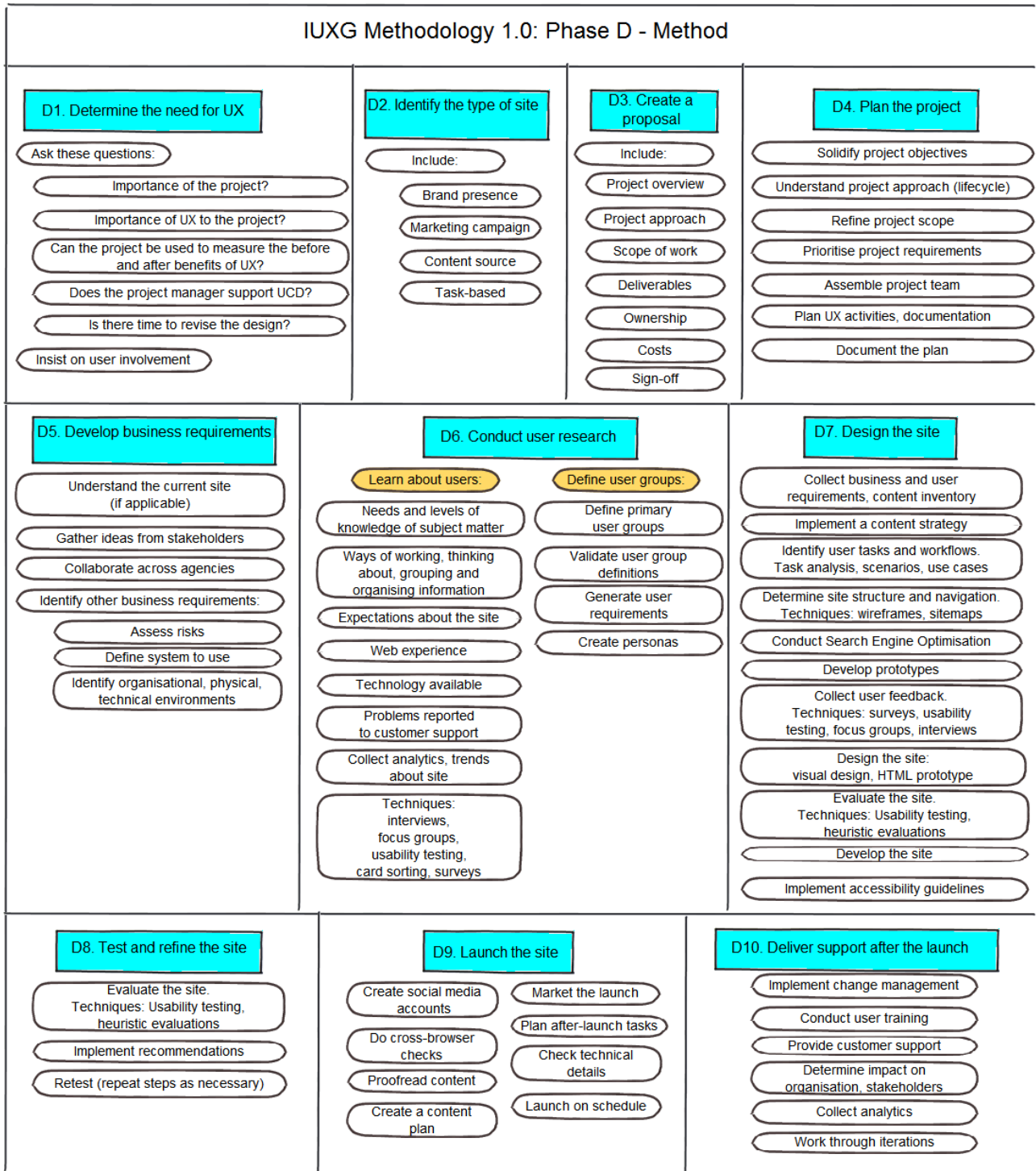


Figure 4.7: Proposed IUXG Methodology 1.0: Phase D - Method

4.4.5 Phase E: Standards

The goal of Phase E, standards, is to minimise rework, enforce consistency and to take advantage of what is already known about best practices. The steps in this phase include the creation of templates, using a testing facility, standardising the UCD process and following best practices and guidelines.

The details of the standards phase are as follow:

- **E1. Create templates** (Schaffer, 2004; Howto.gov, 2011a; Ide-Smith, 2011a; Stagers et al., 2011; Usability.gov, 2012c):
 - *Description:* Templates make completion of the method efficient (explained in Phase D). After using the method for a few projects, the templates will grow and start to formalise. Interface design standards save development time, maintain consistency in designs, improve usability and make maintenance easier. Standards are critical for both the UX staff and the developers.
 - *What to do:*
 - Documents and forms. Instead of creating a testing form from scratch every time a test is required, a usability engineer can take an existing form and modify it for a client's specific test in a short time. Examples include questionnaires, informed consent forms and usability reports;
 - Interface design standards. Wireframes and design templates can be created for reuse. Design standards can be applied to a website and also to all public sites of an organisation, extranets and intranet.

- **E2. Create a testing facility** (Schaffer, 2004):
 - *Description:* A testing facility can range from a simple office setting to a full-blown usability testing laboratory. It is acceptable to use a conference room to run tests; it is critical, however, that the room must be reasonably quiet and free of interruptions. A dedicated usability testing facility shows a commitment to testing within the organisation.
 - *What to do:*
 - Select a testing facility. A formal usability laboratory can be built. Alternatively, an informal setting such as a conference room can be used;
 - Conduct frequent usability testing (see Phase D: Method: test and refine).

- **E3. Standardise processes** (Ide-Smith, 2011a):
 - *Description:* Standardising processes saves time and helps with a UX roll out.

- *What to do:*
 - **Standardise the UCD process.** A general UCD process was defined in Phase B. After using the UCD process on several projects, the process can be standardised.
- **E4. Compile best practices and guidelines** (ISO TR 18529, 2000; Schaffer, 2004; Howto.gov, 2011a; Usability.gov, 2012c; Howto.gov, 2012b):
 - *Description:* Take advantage of what is already known about best practices for each step of the process.
 - *What to do:*
 - Compile and use a list of resources. Visit websites explaining UX practices and current trends frequently. Examples of such websites include: www.useit.com; www.usability.gov; www.howto.gov; and www.uie.com.

Figure 4.10, the initial, proposed methodology for institutionalising UX, includes the standards steps as Phase E. The standards method steps, described above, are summarised in Figure 4.8.

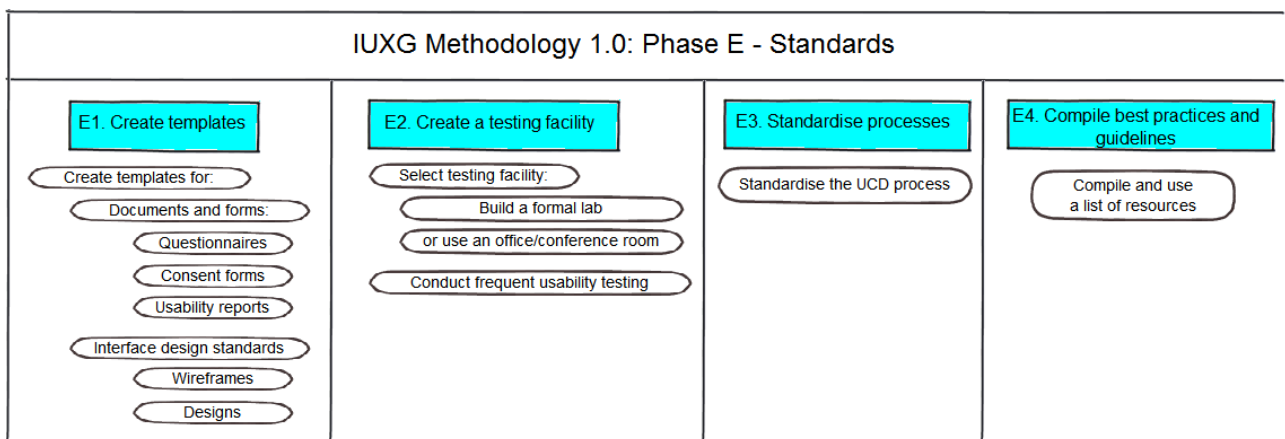


Figure 4.8: Proposed IUXG Methodology 1.0: Phase E - Standards

4.4.6 Phase F: Long-term

The long-term phase focuses on the management of UX in the organisation, including maintaining respect and momentum, taking responsibility, reporting to executives and evangelising UX. Overall metrics about the website and the UX team performance should be collected. A country's laws and regulations (such as accessibility regulations) should be obeyed. Finally, the UX team must keep abreast of latest trends and research.

The long-term phase consists of the following steps:

- **F1. Maintain the management relationship** (Nall, 2004; Schaffer, 2004; Travis, 2005; Unger and Chandler, 2009; Ide-Smith, 2011a; Usability.gov, 2012c; Howto.gov, 2012a):
 - *Description:* Keep UX vibrant, effective and respected.
 - *What to do:*
 - *Maintain respect:*
 - The UX team needs to maintain enough respect in order for users' needs to be fulfilled without being marginalised, ignored or overrun with technology taking precedence over usability;
 - Understand technical language and feasibility;
 - Be able to demonstrate research-based recommendations.
 - *Maintain momentum:*
 - It takes time to propagate UX into an organisation. However, it is critical to keep momentum at a rate that is motivating for the UX staff and development team;
 - If there are too few practitioners, too many projects must not be undertaken. Keep the effort focused on smaller projects that can become showcase projects.
 - *Take responsibility:*
 - Take responsibility for usability throughout the organisation.
 - *Report to executives:*
 - Report progress and achievements to executives.
 - *Evangelise:*
 - Conduct training and workshops. Organisational change is most effective when other people are empowered to implement it;
 - Mentor junior UX and other staff;
 - Maintain a usability intranet with past reports, highlights videos, guidance for best practice, a slide show and advocacy material that supporters can easily customise;
 - Newsletters (teach people that UX means more than just testing);
 - Speak at industry meetings and UX conferences. This will validate the importance and relevance of UX work in the eyes of one's peers;

- Increase the UX team's profile with professionally-produced posters and giveaways such as mugs and t-shirts;
 - “*First Fridays*”. The goal of “*First Fridays*” is to teach staff how to find and fix usability problems on websites and applications. This is done by conducting a small usability test with three users. After the test, the observers debrief over lunch and identify the three most serious problems and quick-fix solutions to be completed within 30 days.
- **F2. Collect metrics** (Schaffer, 2004; Pretorius, Calitz and van Greunen, 2005; Pretorius, 2005; Unger and Chandler, 2009; Ide-Smith, 2011a; The Westover Group, 2011; Howto.gov, 2012b):
 - *Description*: Measure usability to show that the investment is working and highlight areas for improvement. These metrics also assist to measure if business requirements are being met. Metrics should be customised for the type of website and type of business that is being conducted on the website. Website and usability analytics and metrics should be collected as well, in order to explain how well a website is meeting its objectives, in order for improvements to be made.
 - *What to do*:
 - *Collect and measure UX business metrics*. The main purpose of these metrics is to validate that UX work is actually being done and to show the growth and stability of UX in the organisation. Track the number of staff hired and trained, the number of people working on usability issues and the number of projects that do or do not apply UCD;
 - *Collect and measure website analytics*. The following is a list of popular analytics:
 - Page views;
 - Time on site;
 - Downloads;
 - Click paths;
 - Referral websites;
 - Conversions;
 - New users and returning users;

- Search engines used;
 - Keywords used in search engines.
 - *Collect and measure usability testing metrics.* The following is a list of common metrics used in usability testing:
 - Task completion time;
 - Response time;
 - Search time;
 - Response scores;
 - Number and percentage of tasks completed correctly with and without assistance;
 - Number and percentage of tasks not completed;
 - Number of steps to complete a task;
 - Number of times assistance was used in the form of help or documentation;
 - Time spent when help was used;
 - Number of errors;
 - Time needed to recover from errors;
 - Comparison testing: which one of the two products do the participants prefer?
 - *Collect and measure customer feedback.* Customer feedback should be collected from surveys, call centres and e-mail channels.
- **F3. Adhere to laws and regulations** (ISO TR 18529, 2000; Travis, 2005; Usability.gov, 2012c; Howto.gov, 2012b):
 - *Description:* If a government public website is developed, awareness of the laws, regulations, policies and other directives is essential. For example, in the United States, laws exist regarding accessibility requirements.
 - *What to do:*
 - Adhere to current laws, regulations and policies regarding government websites. Be aware of upcoming laws, regulations and policies.
 - **F4. Stay up to date with latest trends and research** (Howto.gov, 2012b):
 - *Description:* Stay current with latest research, trends and best practices.

- *What to do:*
 - Conduct training (see Phase B: Setup: training);
 - Attend conferences and industry events;
 - Keep up to date with best practices (see Phase E: Standards: best practices and guidelines);
 - Compile a list of resources (see Phase E: Standards: templates).

Figure 4.10, the initial proposed methodology for institutionalising UX, includes the long-term steps as Phase F. The long-term method steps, described above, are summarised in Figure 4.9.

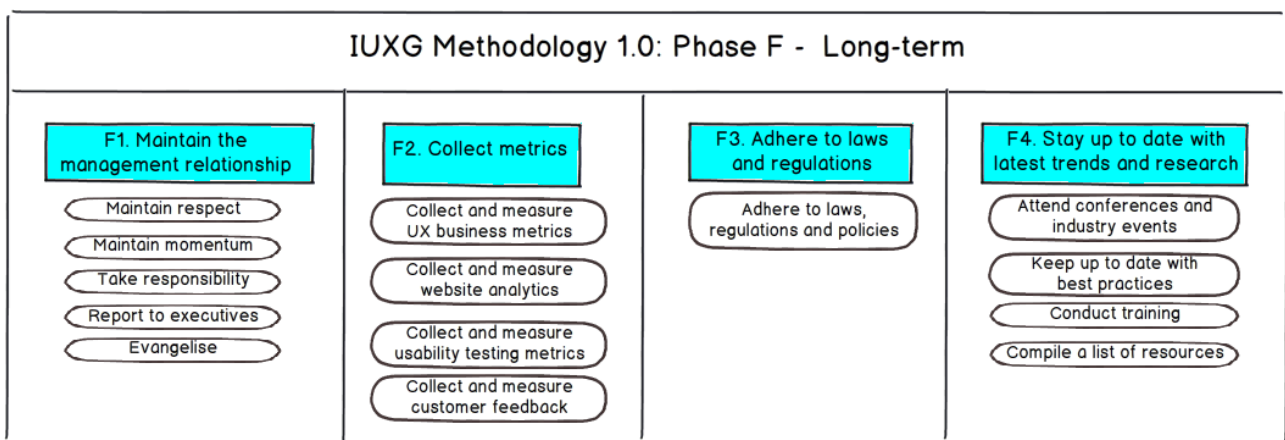


Figure 4.9: Proposed IUXG Methodology 1.0: Phase F – Long-term

4.4.7 The Initial Proposed Methodology for Institutionalising User Experience

Figure 4.10, uses the information from Sub-section 4.4.1 to Sub-section 4.4.6 to provide the initial proposed methodology for institutionalising UX (IUXG 1.0). This methodology is the second deliverable of this chapter and answers RQ2b (see Section 4.5: Summary). Figure 4.10 provides the main phases of the methodology, as well as the next high-level steps. Figure 4.4 to Figure 4.9 provided the more detailed sub-steps for each of the main steps.

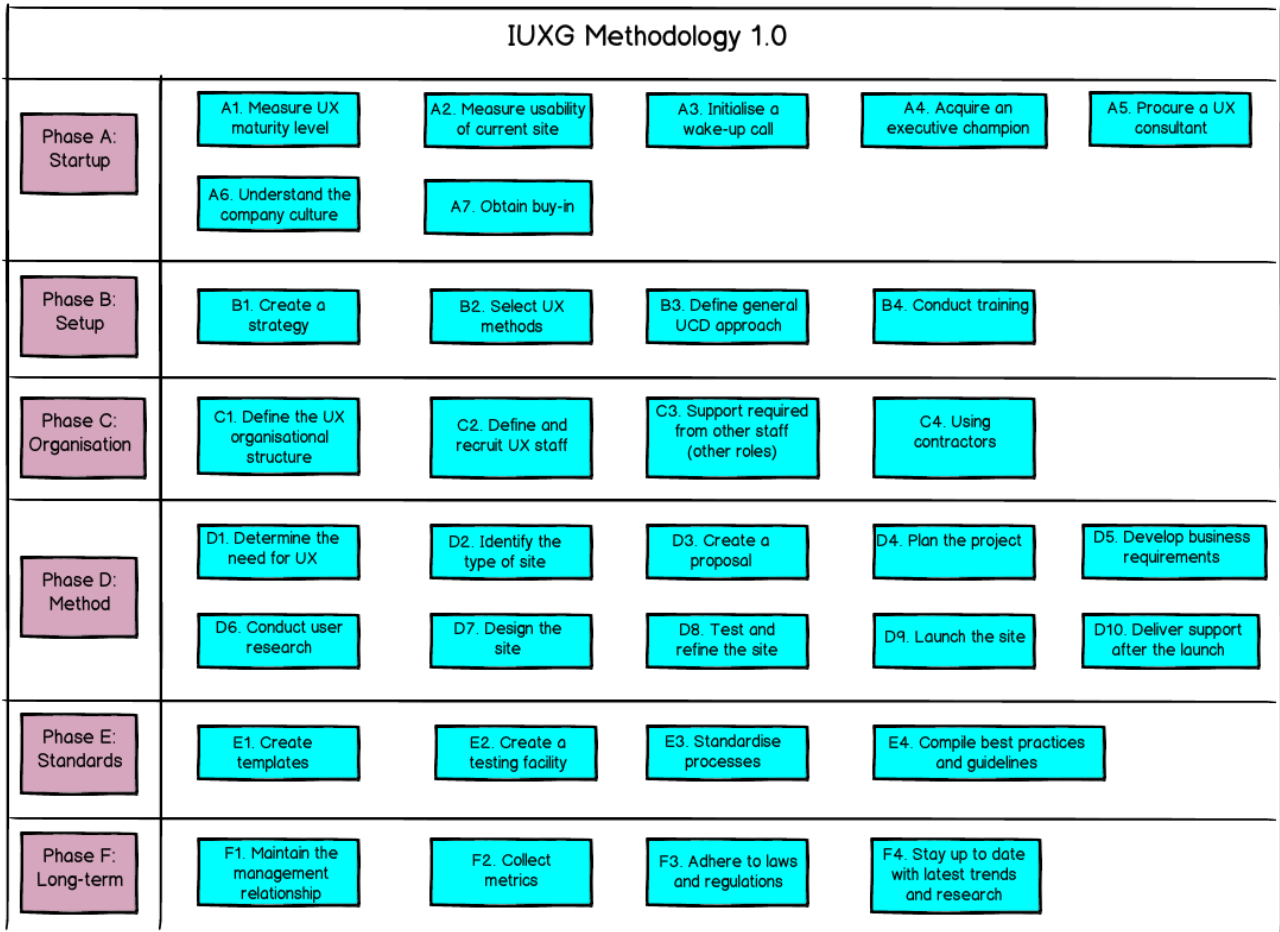


Figure 4.10: Proposed IUXG Methodology 1.0

The IUXG methodology above was proposed from five UX methodologies found in literature (Section 4.2), as well as best practices found in literature (Section 4.3). Chapter 2 discussed the different versions of the IUXG methodology that will be delivered: this is IUXG methodology 1.0. This IUXG methodology is updated and tailored for South African PGs in Chapter 6 (IUXG methodology 1.1). The IUXG methodology 1.0 proposed in this chapter is not yet tailored for South African PGs and can be applied by any organisation wishing to institutionalise UX.

The IUXG methodology is finally updated in Chapter 8, after the results of the case study (IUXG methodology 2.0). Any South African PG would be able to apply the final IUXG methodology in order to institutionalise UX. The next section summarises the findings of this chapter.

4.5 Summary

Section 4.1 identified the deliverable of this chapter: a proposed IUXG (Institutionalise UX in Government) methodology to institutionalise UX in an organisation. The research objective of this chapter was:

RO2. Propose a methodology for the institutionalisation of UX (IUXG 1.0).

The first research question of this chapter was:

RQ2a. What current UX methodologies can be identified from literature?

Five UX methodologies from current literature were identified (Section 4.2) including methodologies from: Schaffer (2004); Stagers et al., (2011); ISO TR 18529 (2000); Unger and Chandler (2009); and Usability.gov (2012c). These UX methodologies are not aimed at PGs. The overall objective of this research is to propose and evaluate a UX methodology for South African PGs.

The second research question of this chapter was:

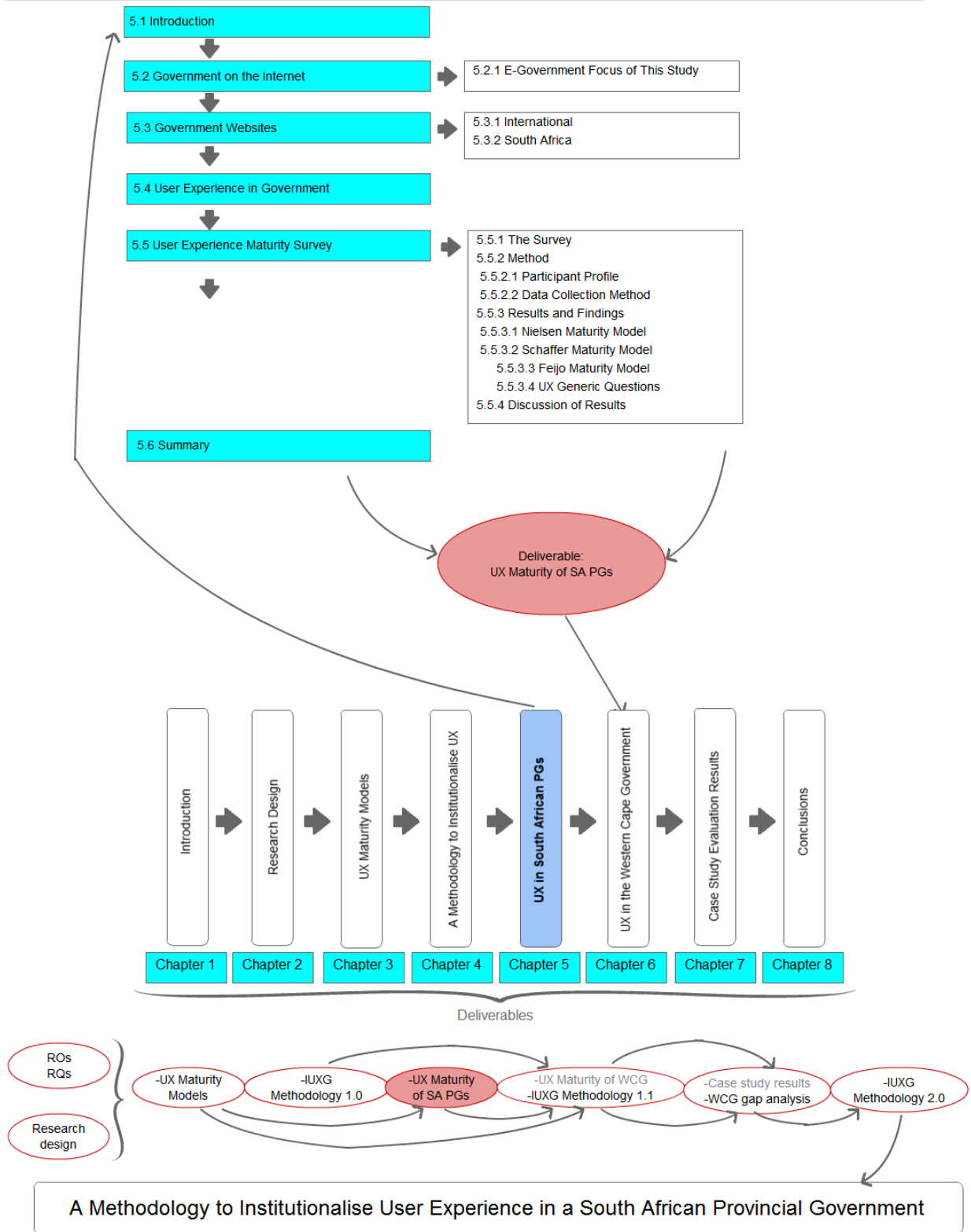
RQ2b. What integrated methodology can be proposed to institutionalise UX (IUXG 1.0)?

A methodology to institutionalise UX (IUXG methodology 1.0) was proposed (Section 4.4, Figure 4.10). The IUXG methodology was proposed from the five UX methodologies found in literature (Section 4.2), as well as best practices and lessons learnt from international studies, where UX was embedded in large organisations (Section 4.3). The proposed methodology can be applied by any organisation aspiring to institutionalise UX.

The IUXG methodology is updated and tailored for South African PGs in Chapter 6. The IUXG methodology is finally updated in Chapter 8, after the results of the case study. The final IUXG methodology would allow any South African PG to apply the steps to institutionalise UX.

A need exists to measure how well organisations conduct UX in their organisations (Earthy, 1998). UX maturity models allow an organisation to measure its current status and to identify the status at which it wishes to be. The UX maturity of South African PGs are investigated in the next chapter.

Chapter 5: User Experience in South African Provincial Governments



Chapter 5: User Experience in South African Provincial Governments

5.1 Introduction

The growth in Africa's Internet and broadband sector has significantly increased in recent years, specifically in the e-Government sector. The Internet has become a crucial tool to disseminate information to citizens; however, poorly designed websites can drive a wedge between a government and its citizens (Bailey, 2002). Designing a user-friendly and functional provincial government website is a challenging task (Straub and Gerrol, 2008). A website that is difficult to navigate and does not meet the user's needs and requirements increases the task difficulty and complexity. Straub and Gerrol (2008: 2), summarise the problem as follows: "*Putting government online is one thing – making government websites functional and easy to use is quite another*".

The lack of utilisation of user-centred design (UCD) methodologies and poor usability of government websites are major obstacles in several countries. Usability and user experience (UX) is an important factor in designing e-Government websites; there is, however, some disagreement about the extent that usability has been achieved in the majority of e-Government websites (Berman et al., 2010). African e-Government websites, such as South African websites, generally have higher failure rates and usability problems compared with developed nations (Chango, 2007).

A need exists for organisations to measure how well they conduct UX (Earthy, 1998). At present, a number of guidelines and principles exist for e-Government website design (Mifsud, 2011); however, there are indications that there is limited application of these principles and guidelines by South African Provincial Government (PG) website designers (Pretorius and Calitz, 2012). These guidelines cannot be implemented if there is no executive support, adequately trained staff, budget or the use of usability methodologies and UCD processes.

The research objective addressed in this chapter is:

RO3. Evaluate the maturity model level of UX in South African PGs.

The research question addressed in this chapter is:

RQ3. What is the maturity model level of UX in South African PGs?

This chapter will examine government on the Internet (e-Government) (Section 5.2). The e-Government focus of this study will be explained in Sub-section 5.2.1. The use of government websites internationally (Sub-section 5.3.1) and in South Africa (Sub-section 5.3.2) will be investigated.

Section 5.4 examines the role of UX in government. The UX maturity of South African Provincial Governments is examined in Section 5.5 by means of a survey conducted amongst stakeholders in each of the nine provinces in South Africa. The deliverable of this chapter is the maturity model level of UX in South African PGs. The results of the study indicate a lack of UX processes in South African PGs and the limited use of a standardised UCD methodology. Section 5.6 summarises the findings of this chapter.

5.2 Government on the Internet

One of the most important relationships people have, is with the elected government (Harrell, 2012). Citizens interact with government offices and officials in several ways, including websites, phone applications or other types of technology (Harrell, 2012). The Internet offers governments an opportunity to reinvent themselves even as they address a host of financial and economic challenges (United Nations, 2010). The Internet provides an opportunity for governments to offer services to their citizens via websites (Asimwe and Lim, 2010). An increasing number of citizens is reaching out to government to find information and services to improve their daily lives (Usability.gov, 2012a). The Internet has made it possible for every level of government to (Straub and Gerrol, 2008):

- Connect with citizens;
- Communicate rapidly and effectively;
- Make services easily available;
- Broadcast valuable information;
- Potentially increase operational efficiency;
- Reduce costs substantially;
- Save citizens' time and money.

Citizens are benefiting from more advanced services (delivered through e-Government): better access to information, more efficient government management and improved interactions with

governments, primarily as a result of increasing use by the public sector of Information and Communications Technology (ICT) (United Nations, 2010).

E-Government (electronic government), also known as e-Gov, digital government, online government or connected government, is the use of ICT to provide more efficient government services, empower citizens through access to information and facilitate communication between government and the community (Chango, 2007; Yeratziotis, 2008). E-Government is the use of ICT to exchange information and services with citizens, businesses and between government departments (Mwange, 2007). It involves the use of Internet-based technologies to provide convenient access to government information and services and to open new ways of engaging with citizens and enterprises (Goh, Chua, Luyt and Lee, 2008).

The primary objective of e-Government is to make governance more efficient; more cost-effective; more responsive to the will and needs of citizens; more responsible and accountable; more accessible and more affordable (Okpaku, 2003). E-Government has progressed to the point where it is now a force for effective governance and citizen participation (United Nations, 2010).

A number of countries have noticed the benefits of e-Government and are placing a high priority on its development; however, many technical and non-technical obstacles prevent e-Government development, especially in developing countries (Mwange, 2007). Governments worldwide have been slow to realise the full potential of digital technology (Eggers, 2005). Technology can transform the government-citizen relationship in the following ways (Eggers, 2005):

1. Reorganise government around citizen needs;
2. Make choice-based service delivery more viable;
3. Provide neutral information to help citizens make important choices;
4. Customise services and interactions between government and citizens;
5. Allow citizens to complete government transactions anywhere, anytime from a variety of devices;
6. Reduce the cost of government.

All points above (Eggers, 2005) relate to the UX of a citizen when interacting with government. The focus of this study is on the institutionalisation of UX in South African PGs. This focus relates to point one and point four above: “*reorganise government around citizen needs*” and “*customise*

services and interactions between government and citizens". Implementing UCD methods will greatly assist to achieve these objectives.

E-Government can offer several benefits to a country if it is properly implemented and designed with sustainability and relevance in mind (Yeratziotis, 2008). Table 5.1 lists the advantages of e-Government, as well as related references. The advantages of e-Government include: increased productivity; access to information; different levels of government can more easily work together; revenue growth and cost reductions; less corruption and increased transparency; promotion of tourism; a civil service culture change from reactive to proactive and improved communication between government and citizens.

Table 5.1: Advantages of e-Government	
Advantages	References
Increased productivity.	Eggers, 2005
Allow access to information to those who could not access it in the past: <ul style="list-style-type: none"> • Reduction of administrative paperwork; • Greater convenience. People will not have to travel long distances to access information and documentation; • Citizens should be able to find what they need quickly and easily online. 	Eggers, 2005; Okpaku, 2003; Yeratziotis, 2008
All levels of government will be able to work together more easily to serve their citizens.	Okpaku, 2003; Yeratziotis, 2008
Revenue growth and cost reductions: <ul style="list-style-type: none"> • Reduce workforce and operating costs; • Higher employee productivity; • Reduce paper costs; • Reduce processing costs; • Better supply chain management; • Better prices on goods and services; • More efficient markets; • Reduced travel and training costs; • Lower building and property costs. 	Okpaku, 2003; Eggers, 2005; Yeratziotis, 2008
Less corruption and increased transparency.	Okpaku, 2003; Eggers, 2005; Yeratziotis, 2008
Promote tourism and investment.	Okpaku, 2003; Yeratziotis, 2008
Change the culture of the civil service from reactive to proactive: <ul style="list-style-type: none"> • There will be a reduction of bottlenecks and delays in the delivery of services by governments. 	Okpaku, 2003; Yeratziotis, 2008

Table 5.1: Advantages of e-Government	
Advantages	References
<p>Improved communication between government and citizens:</p> <ul style="list-style-type: none"> • Governments will be able to get feedback from the public by creating an interactive communication between governments and their citizens on issues of common public concern. 	Okpaku, 2003; Yeratziotis, 2008

E-Government requires proper planning, commitment and patience in order to achieve these benefits (Yeratziotis, 2008). The next sub-section will discuss the elements of e-Government and what the focus of this study will be.

5.2.1 E-Government Focus of This Study

Countries where e-Government initiatives are implemented, typically employ Web portals as the gateway to the government and its services (Goh et al., 2008). Portals offer a single point of entry to multiple agencies and afford users the opportunity to interact easily and seamlessly with these agencies. E-Government does not only include online or Internet-based government, but also (Du Preez, 2009):

- Telephone and fax;
- Short message service (SMS) and multimedia message service (MMS);
- Wireless network and services;
- Bluetooth, smartcards and other near-field communication applications;
- Closed-circuit television (CCTV);
- Tracking systems;
- Radio frequency identification (RFID) and biometric identification;
- Road traffic management and regulatory enforcement;
- Identity cards;
- Polling station technology (non-online e-voting);
- Television and radio-based delivery of government services;
- E-mail, online community facilities and electronic mailing lists.

In order for the elements of e-Government (as listed above) to be successful, components such as infrastructure, connectivity, funding and staff need to be in place. In order to make e-Government a success, the following prerequisites need to be in place (Okpaku, 2003; Yeratziotis, 2008):

- Genuine needs and demands;

- Infrastructure;
- Appropriate software applications and content;
- Widespread and cheap availability of computers and workstations;
- Local language computing and content;
- Appropriate legal framework and legislation;
- Expert technical capacity;
- Widespread popular training in computer literacy and use.

The e-Government user experience depends on the components listed above, as well as current technology, the appropriate tools and continuous improvement (Straub and Gerrol, 2008). Berman et al. (2010) propose six key characteristics for successful e-Government applications and a UCD:

- Digital government must offer low-cost solutions;
- Systems must be easy to use and should be developed through participatory design involving the full spectrum of citizens in all their diversity, including age, culture, education, gender, income, language and disabilities;
- The system must be efficient with a fast access and response time;
- E-government must be informative – providing interesting, worthwhile facts and tips, as short snippets that are clear and easy to read;
- The system must provide added value so that the public will want to use it;
- Online services should be monitored to allow tracking, exploring and analysis of usage, so that government can gauge the success of each component and moreover can corroborate success stories for the public with evidence.

Considerable debate about the means exists; however, not many practitioners argue about the end goal: dramatically improving customer service in government (Eggers, 2005). These points (Berman et al., 2010) are vital and should be considered seriously before a country decides to implement an e-Government initiative (Yeratziotis, 2008). Addressing the points above will provide a major boost for successful e-Government implementation in a country and ensure that the public are interested and understand the need to adopt e-Government (Yeratziotis, 2008). One of the components of e-Government and the focus of this research is websites and portals that will provide information to the public online (Okpaku, 2003).

An e-Government portal is an official entry website that contains information about and links to the services provided by all departments and agencies (Huang, 2006). It is an umbrella website where services of different administrative levels, departments and agencies are organised together. An ideal e-Government portal is often referred to as a “*one-stop*” portal and is a direct consequence of the integrated delivery of information and services to customers of the government (Tambouris and Wimmer, 2005). An e-Government website is a key priority for governments when they develop their e-Government systems (Garcia, Maciel and Pinto, 2005; Huang, 2010). This study will focus on the website aspects of e-Government and how to institutionalise UX in environments responsible for these websites.

Portals are a key front office vehicle to deliver integrated services to citizens and businesses (Blessing and NtombovKlass, 2009). Internationally, public-sector portals have helped to reshape, reorganise and recreate the governments that built them (Eggers, 2005). Many e-Government websites, particularly those established and operated by governmental agencies, are still in their infancy stage and cannot provide services that are satisfactory in either quantity or quality (Robinson, Yu, Zeller and Felten, 2009).

Currently, there is an increase in the use of e-Government and visits to government websites will continue to grow in the future (Usability.gov, 2012a). Citizens are searching for online government information in unprecedented numbers, increasingly making transactions and participating in discussion around policies (Howard, 2010). In 2009, the Pew Internet and American Life Project found that 82% of Internet users (or 61% of American adults) had looked up information or completed a transaction on a government website (Tessler, 2010).

Rising citizen expectations are forcing governments to focus more time and attention on creating better, more personalised customer experiences (Eggers, 2005). The increased access to governmental websites implies an increase in the workload of governmental employees and an increase in e-mails, complaints and phone calls. A website that is not easy to learn or to navigate and does not match user needs and requirements, increases the task difficulty and complexity. Poorly designed websites can drive a wedge between government and citizens (Bailey, 2002).

Making use of UX guidelines for e-Government websites, results in more usable, transparent websites that can be used to their full potential (Yeratziotis, 2008). A number of guidelines and

principles exist for e-Government websites (Section 5.4); however, there are very few signs that the principles and guidelines are being implemented in South African e-Government websites. The question then arises: do South African e-Government institutions know how to implement these guidelines? This question leads us to the research question for this chapter (RQ3): *What is the maturity model level of UX in South African PGs?*

The next section will investigate government websites internationally and in South Africa. Section 5.5 will answer the research question by means of a survey conducted with South African PG website stakeholders.

5.3 Government Websites

This section will investigate government websites on an international and National (South African) level.

5.3.1 International

Progress in online service delivery continues in most countries around the world (United Nations, 2012). The top 20 countries in e-Government development are listed in Table 5.2 (United Nations, 2010; United Nations, 2012).

Countries are rated according to their e-Government development index value. This value was calculated by the rating of questions focusing on areas such as how governments are using websites and Web portals to deliver public services and expand opportunities for citizens to participate in decision-making. The criteria included scope and quality of services, telecommunications index and human capital index.

The Republic of Korea, The United States (US) and Canada were rated the best in the e-Government development index in 2010. In 2012, the Republic of Korea, Netherlands and the United Kingdom were rated the best in the e-Government development index. Bahrain, an emerging market, made significant strides moving from 42nd place in 2008 to 13th in 2010. The cause of this increase was the emphasis on citizen engagement and the electronic provision of government services (United Nations, 2010). In 2012, all countries in the top 20 were developed, high-income countries.

Table 5.2: Top 20 Countries in e-Government Development (2010 and 2012)				
Sources: United Nations, 2010; United Nations, 2012.				
2010		Rank	2012	
Country	e-Government Development Index Value		Country	e-Government Development Index Value
Republic of Korea	0.8785	1.	Republic of Korea	0.9283
United States	0.8510	2.	Netherlands	0.9125
Canada	0.8448	3.	United Kingdom	0.8960
United Kingdom	0.8147	4.	Denmark	0.8889
Netherlands	0.8097	5.	United States	0.8687
Norway	0.8020	6.	France	0.8635
Denmark	0.7872	7.	Sweden	0.8599
Australia	0.7863	8.	Norway	0.8593
Spain	0.7516	9.	Finland	0.8505
France	0.7510	10.	Singapore	0.8474
Singapore	0.7476	11.	Canada	0.8430
Sweden	0.7474	12.	Australia	0.8390
Bahrain	0.7363	13.	New Zealand	0.8381
New Zealand	0.7311	14.	Liechtenstein	0.8264
Germany	0.7309	15.	Switzerland	0.8134
Belgium	0.7225	16.	Israel	0.8100
Japan	0.7152	17.	Germany	0.8079
Switzerland	0.7136	18.	Japan	0.8019
Finland	0.6967	19.	Luxembourg	0.8014
Estonia	0.6965	20.	Estonia	0.7987

The Republic of Korea was the highest ranking country in the 2010 and 2012 United Nations Surveys and its national portal (Figure 5.1) also received the highest ranking (United Nations, 2010; United Nations, 2012). The Government's main website has developed into an integrated portal where citizens can find almost every service they want (United Nations, 2012).

The US was found, as before, a best practice example of an integrated portal that provides easy to navigate design. The portal collects and consolidates all information and services for citizens in one place, including agency services at the state and local level, which vastly increases the effectiveness of user search and uptake (United Nations, 2012).

In the US, the federal government is the largest single producer, collector, consumer and disseminator of information (Usability.gov, 2012a). An increasing number of Americans are interacting with local, state and federal government offices online (Tessler, 2010). US citizens are turning to the Internet to renew driver's licenses and car registrations, to apply for hunting and

fishing permits, to pay parking tickets and other fines and even to track campaign contributions and stimulus spending (Tessler, 2010). Figure 5.2 illustrates the US White House government website.

An example of the services and functionality offered by international sites is the Student Aid portal run by the US Department of Education (Eggers, 2005). This portal takes prospective college students through every step of planning and preparing for college. The website matches students to colleges that best meet their abilities and preferences. Students need to enter basic information on the website and can then compare colleges for size, costs, majors offered and be matched to scholarships, bursaries and loans. Students can also apply for financial aid online and fill out college applications without ever leaving the website. The next sub-section will discuss South African Government websites.

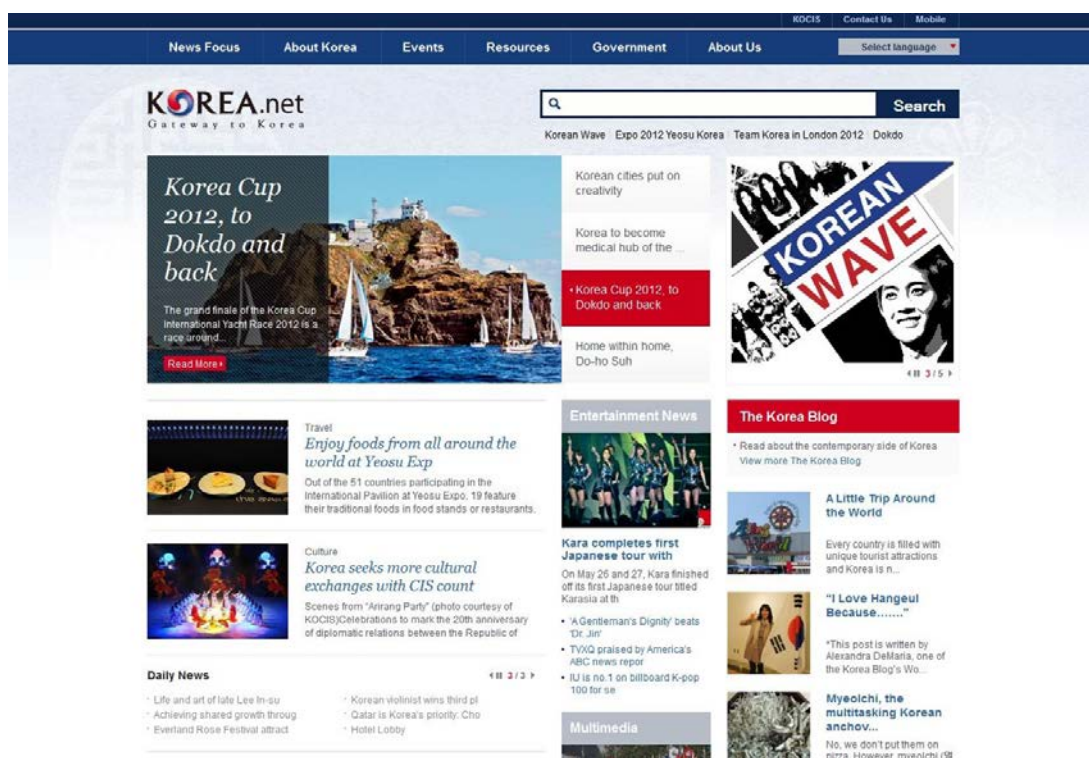


Figure 5.1: The Korean Government Website

Source: www.korea.net, June 2012.



Figure 5.2: The White House Government Website

Source: www.whitehouse.gov, June 2012.

5.3.2 South Africa

The South African Government has already recognised the potential benefits to be gained from harnessing the power of ICT (Bridges.org, 2003). The Presidency of South Africa has explicitly supported the development of e-Government in 2001, as well as the wide adoption of ICT in the country (Provincial Government of the Western Cape, 2001). The South African Government has committed itself to provide information to all sectors of the population (Korsten and Bothma, 2005).

In emerging and developing countries, such as South Africa, the challenge is to invest in three dimensions – online services, telecommunication infrastructure and education – to narrow the current digital gap (United Nations, 2010). One problem, however, is that African e-Government websites, including South Africa, have a higher rate of failure than success (Chango, 2007). Although the development of e-Government is proceeding at a tremendous pace in the developed world, the same cannot be said of Africa's experiences with e-Government (Blessing and

NtombovKlass, 2009). Visiting South African Government websites can be a frustrating experience (Vermeulen, 2010). South African e-Government websites have failed to build trust in citizens in online service offerings (Murray and Renaud, 2012).

Figure 5.3 illustrates the South African Government website appearance in 2009. Noupe (2009) included the South African e-Government website, illustrated in Figure 5.3, in their list of *'the ultimate ugly government websites'*. The site had a message that stated that this website is best viewed using an 800×600 resolution in Internet Explorer 4.



Figure 5.3: SA Government Website in 2009

Source: Noupe, 2009.

Figure 5.4 illustrates the South African Government website, which has been updated since the Noupe (2009) study (Figure 5.3). Table 5.2 listed the top 20 countries in e-Government development. In 2010, South Africa came in only at fourth position in Africa and 97th worldwide (United Nations, 2010). In 2012, South Africa improved by finishing in third position in Africa; however, globally dropped to position 101 (United Nations, 2012).

The government in South Africa consists of national government (website explained above), nine provinces and 283 municipalities (Department of Provincial and Local Government, 2007). Table 5.3 lists the South African Provincial Governments (PGs) and their websites. Figure 5.5 illustrates the North West PG website, which violates several usability and design guidelines. The website

contains stretched images. Non-aligned design elements are clearly visible; the content is out-dated; poor background and text contrast are evident and several pages are below the fold. A UX process and methodology would greatly assist this PG to improve its website. The next section investigates UX in e-Government.

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President Jacob Zuma appoints task team to investigate delays in delivery of textbooks in Limpopo
President Jacob Zuma has appointed a task team to look into the causes of the delays in delivering textbooks to Limpopo schools and make recommendations, following a meeting with Minister of Education Angie Motshhega and Deputy Minister Enver Surty.
>> President Jacob Zuma meets Minister Angie Motshhega on Limpopo textbooks situation

Textbook delivery verification starts
The verification process will start today under the leadership of Ms Mary Metcalfe. The Department of Basic Education has a helpline number for the public to report any problems regarding the delivery of textbooks in Limpopo. The number is **0800 202 933**.

President Zuma leads delegation to Ordinary Session of African Union Assembly
President Jacob Zuma will lead South African to the 19th Ordinary Session of the African Union (AU) Assembly in Ethiopia later this month. The election of the Chairperson of the African Union Commission, for which the Southern African Development Community is endorsing Dr Nkosazana Dlamini Zuma, is scheduled for 15 July.

2012 Tax Season launched
The new tax season opened on 1 July 2012. For everything you need to know about tax returns, read the South African Revenue Service's 2012 Tax Season Guide or visit the 2012 Tax Season webpage.
>> Minister Gordhan announcing the tax season

Tenders
- Tender Bulletin No. 2733 [PDF] of 29 June 2012 is now available.
- Subscribe to tender bulletin alert

New on the website
- Minister Lindwe Sisulu on Auditor General and Public Protector investigation
- Environmental Affairs on rhino poaching
- Deputy Minister Obed Bapela on service delivery improvements
>> more

13 168
- The number of people passing their trade tests to qualify as artisans in 2011/12. This number has more than doubled in the last four years, from 6 030 in 2007/08.

Fuel price adjustment
The price of petrol will decrease by 85 cents and 89 cents per litre. This will be implemented on Wednesday, 4 July 2012.

Minister Molewa on outcomes of Rio+20
The South African Government is ready to actively engage on the Sustainable Development Financing Strategy following the Rio +20 United Nations Conference on Sustainable Development, says Minister of Water and Environmental Affairs Edna Molewa.
>> Rio+20 agreements to benefit women

Government welcomes GEF funding to fight rhino poaching
The Department of Environmental Affairs has welcomed the R25 million approved by the Council of the Global Environment Facility (GEF) to strengthen South Africa's ability to combat wildlife crimes.

Documents for comment
- Draft Higher Education and Training Information Policy - comments by 23 July 2012
- Draft Liquor Products Amendment Bill - comments by 6 August 2012
- Disaster Management Act: Draft urban search and rescue framework - comments by 17 August 2012
>> more

Events on 4 July
- President Jacob Zuma attends Social Cohesion Summit
- Minister Maite Nkoana-Mashabane holds bilateral consultations with Belgian counterpart
- Deputy Minister Obed Bapela briefs media on Front Line Service Delivery Monitoring Performance Monitoring Report
>> more
>> future events

Outcomes approach
(outcomes and delivery agreements)
- Programme of Action (The Presidency)

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SA Government news agency

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Government's views on current issues

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website: www.gcis.gov.za

Figure 5.4: Current SA Government Website

Source: www.gov.za, July 2012.

Table 5.3: South African Provincial Government Websites		
Provinces		Website (as on November 2012)
1.	Gauteng	www.gautengonline.gov.za
2.	Western Cape	www.westerncape.gov.za
3.	Free State	www.fs.gov.za
4.	Eastern Cape	www.ecprov.gov.za
5.	Kwazulu-Natal	www.kznonline.gov.za/
6.	Limpopo	www.limpopo.gov.za
7.	Mpumalanga	www.mpumalanga.gov.za
8.	Northern Cape	www.northern-cape.gov.za
9.	North West	www.nwpg.gov.za



Figure 5.5: The Homepage of the North West Provincial Government

Source: www.nwpg.gov.za, January 2012.

5.4 User Experience in Government

E-Government aims to improve the lives of citizens and make government agencies more efficient and accessible; however, it is well known that most e-Government systems fail to achieve this (Berman et al., 2010). Government websites potentially offer great benefits to citizens and

governments (Section 5.2). Such benefits, however, cannot be realised if websites are unusable (Asiimwe and Lim, 2010). Usability is an important factor in designing e-Government websites (Asiimwe and Lim, 2010); however, there is some disagreement about the extent that usability has been achieved in the majority of e-Government websites (Berman et al., 2010).

Visitors to government websites often find that agencies have not done enough to anticipate the needs of visitors or make information easy to locate (Straub and Gerrol, 2008). A government website should be designed from the public's point of view (Eggers, 2005). The whole purpose of transparency is defeated if the website is unintelligible or difficult to navigate (Eggers, 2005). Government websites, with the responsibility of helping the citizens and other agencies, need to satisfy customer requirements (Van Duyne, Landay and Hong, 2007). A lack of usability can be considered as one of the major problems causing the underuse of governmental websites (Al-Khalifa, 2010).

Increased perception of the usefulness and ease of use of e-Government websites to citizens directly enhances the level of the citizen's continued intention to use e-Government websites (Wangpipatwong, Chutimaskul and Papisratorn, 2008). One of the reasons for the lack of success of e-Government is that systems tend to focus primarily on the technical aspects and less on the users (Xiong, 2006). It can be argued that, unless usability at a detailed level in e-Government website design is addressed, e-Government still retains the challenging target of how best to interact with users (Baker, 2009; Huang, 2010).

A United Nations e-Government survey places focus on the users. An important assessment requirement is the need for solid evidence of an approach to e-Government development that places citizens at the centre (United Nations, 2010). If government websites do not meet the needs of visitors to the website, then the number of complaints from unsatisfied citizens will proportionally increase with traffic (Mifsud, 2011). Due to the fact that governments must adopt citizen-centric approaches, such lack of service has larger repercussions (Mifsud, 2011). This is the reason why usability plays such a pivotal role in the websites of governments and those of their agencies (Mifsud, 2011).

Research indicates the importance of usability to e-Government (Kumar et al., 2007; Donker-Kuijter, Jong and Lentz, 2010; Huang, 2010; Magoutas and Mentzas, 2010; Magoutas, Schmidt,

Mentzas and Stojanovic, 2010; AlFawwaz, 2011; Mifsud, 2011); however, there is limited attention focusing on usability in e-Government website design (Huang, 2010). Although international guidelines on webpage development, to help website administrators develop usable websites, exist, these guidelines are not often followed (Gwardak and Pålhorstorp, 2007; Asimwe and Lim, 2010).

The use of usability in international and South African government websites will be discussed next. In the United States the importance of usability in government websites has grown and is considered a best practice (Usability.gov, 2012a). Examples of US Departments which make sure that usability is part of the website development lifecycle include US Department of Health and Human Services, General Services Administration, Social Security Administration, Bureau of Labour Statistics, US Census Bureau, Department of Homeland Security and the Internal Revenue Service (Usability.gov, 2012a).

The US has an official usability website (www.usability.gov) that is a one-stop source for government Web Designers to learn how to make websites more usable, useful and accessible. Additionally, the US has a supporting website (www.howto.gov) whose goal is to help government workers deliver a better customer experience to citizens. The website shares new ideas, common challenges, lessons learned and successes across government. Howto.gov offers best practices, training and guidance on: federal Web requirements and policies; Web content management, usability and design; contact centre services; online citizen engagement through social media and open government; cloud computing, apps, data and Web infrastructure tools; strategic planning and coordinating of customer service channels.

In January 2012, The United Kingdom government launched a BETA version of a new website (www.gov.uk) to replace the existing website (www.direct.gov.uk) (Charlie, 2012). The sites are illustrated in Figure 5.6; the new Beta version to the left and the older version to the right. The goal is to provide access to all government information in one place (Charlie, 2012). A main component of the new interface is a search engine with a simple user interface (similar to that of Google). The website states: “*We’re trying to make this site as accessible and usable as we can for everyone*”.

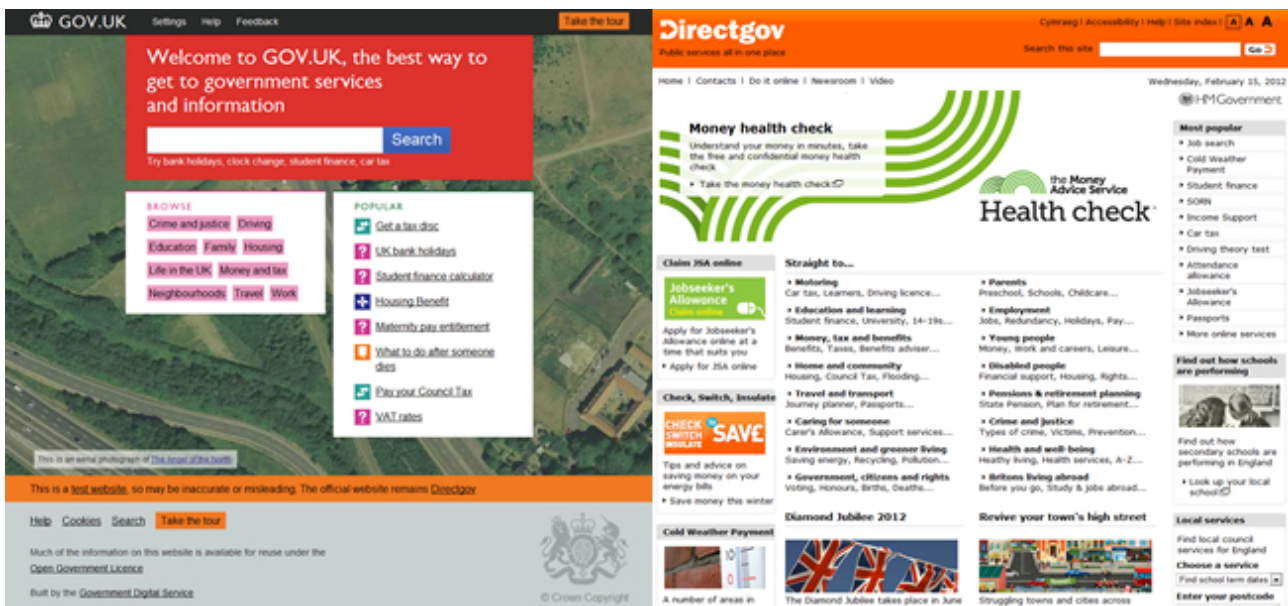


Figure 5.6: UK Government Websites: Gov.uk and Direct.gov.uk

Source: Charlie, 2012: 1.

The Queensland Government in Australia has a website (www.qld.gov.au/web/) that provides standards and guidelines essential for developing Queensland Government websites and applications. The website provides a *Consistent User Experience (CUE)* standard that applies to all Queensland Government public websites and online applications (including mobile device applications). To ensure a consistent experience, the CUE standards require that:

- Agency webpages are displayed consistently, with elements such as the navigation, search button and agency name always in the same place;
- Navigation is based on what visitors are likely to be looking for, rather than on how departments are organised;
- The underlying techniques used to create the pages ensure they are accessible to as many people as possible.

Mifsud (2011) provides a list of government usability guidelines from around the world. The countries include: Australia; Canada; Chile; Colombia; Germany; India; Italy; Malta; Netherlands; New Zealand; Norway; Sweden; United Arab Emirates; United Kingdom; United States and Uruguay. The list does not include one African country.

Asiimwe and Lim (2010) provide usability guidelines for Ugandan Government websites. These guidelines include recommendations for design layout, navigation and legal policies (Asiimwe and

Lim, 2010). A study was conducted examining the usability of four Ugandan Government websites. To make their websites usable, Web developers of Ugandan websites are strongly urged to have a clear and detailed plan (Asiimwe and Lim, 2010). They should also follow international usability and accessibility guidelines to help overcome identified usability problems (Asiimwe and Lim, 2010).

Usability research was conducted on the e-Government website of Jordan (AlFawwaz, 2011), where it was found that the lack of clear usability standards and guidelines contributed to the lack of usability. The research further revealed that the main problems undermining the e-Government website usability was: the lack of general usability awareness amongst management; the insufficient level of user involvement; limited budgets and the lack of expert Web designers (AlFawwaz, 2011).

Yeratziotis (2008) provides guidelines and recommendations that will improve the South African e-Government website, www.gov.za. The focus was on the cultural behaviours, perceptions and Web design preferences of South African users (Yeratziotis, 2008). Usability guidelines for e-Government websites, such as those listed above, exist, however there are very few signs that indicate that South African PGs have applied these guidelines on existing sites. In the South African Government environment, there are limited signs of citizen-centric website development (as described in Section 5.5). Usability is not yet a best practice or a standard in South African national, provincial or local government.

Korsten and Bothma (2005) compiled a South African Government website audit where the findings indicated that there was a need for government websites to improve considerably with regard to content, information architecture, navigation, search and design. The South African Government did not have any direct policies or guidelines relating to Web design when initial government websites were developed (Korsten and Bothma, 2005). Continuous scientific usability engineering practices were not followed during the development of South African Government websites (Korsten and Bothma, 2005). Currently, the problems are the lack of understanding and buy-in of usability at various levels of government and individual authorities do not necessarily have the experience or infrastructure to develop websites that are usable and that can be maintained as content changes (Soufi and Maguire, 2007).

Government should not only develop and maintain useful websites but it also needs to consider the ease of use regarding the varied levels of citizens' computer self-efficacy (Wangpipatwong, Chutimaskul and Papisratorn, 2008). Problems with website accessibility and usability prevent people from accessing and eventually adopting technology such as the Internet and e-Government (Pilling and Boeltzig, 2007). In developing countries such as South Africa, the computer and Internet skills of users vary significantly and this influences the user's ability to use interactive computer systems (Jason, 2008). It is fundamental to create e-Government systems that will be both usable and representative of the social and cultural backgrounds of average South African citizens (Yeratziotis, 2008).

The South African Government introduced the concept of Batho Pele, "*putting people first*" in 1997. Batho Pele is an initiative to allow public servants to be service-orientated, to strive for excellence in service delivery and to commit to continuous service delivery improvement (DPSA, 2011). The goal of this initiative is for the citizen to be at the centre of planning and operations. The citizen as customer is a concept that is integral to the whole notion of Batho Pele and each of the eight principles (listed below) reinforces and encourages the perception of the end-users of public services as customers, rather than simply as citizens (DPSA, 2011).

Batho Pele aims to ensure that all public servants put people first and adhere to the following overarching framework (DPSA, 2011; ETU, 2011):

- *We belong*: we (public servants) are part of the Public Service and should work together and respect fellow colleagues;
- *We care*: caring for the public we serve – our customers;
- *We serve*: all citizens will get good service from public servants.

Batho Pele is based on the following eight principles (DPSA, 2011; ETU, 2011):

1. *Consultation*: citizens should be consulted about their needs;
2. *Standards*: all citizens should know what service to expect;
3. *Redress*: all citizens should be offered an apology and solution when standards are not met;
4. *Access*: all citizens should have equal access to services;
5. *Courtesy*: all citizens should be treated courteously;
6. *Information*: all citizens are entitled to full, accurate information;

7. *Openness and transparency*: all citizens should know how decisions are made and departments are run;
8. *Value for money*: all services provided should offer value for money.

The argument arises, if there is such a big focus on the citizen (user) through the Batho Pele principles, why are the citizens not involved during e-Government website development? The next section investigates the UX maturity of South African PGs by means of a survey. The maturity survey investigates if users were involved (UCD) during e-Government website development.

5.5 User Experience Maturity Survey

Usability means how quickly people can learn to use a system, how efficient they are in its use, how easy it is to remember, how error-prone it is and how much users like using it (Nielsen and Loranger, 2006). UX is all aspects of the user's experience when interacting with the system that makes up the user's perceptions (ISO 9241-210, 2010; Usability Body of Knowledge, 2012). UX design refers to making systems and services that are not only usable but also useful and appealing (Schaffer, 2004).

UX maturity models allow an organisation to measure its current UX level and to identify the level at which they wish to be. Chapter 3 investigated UX maturity models. The research objective of this chapter is to *evaluate the maturity model level of UX in PGs of South Africa*. The level of UX of South African PGs will be evaluated by means of a survey, using the identified maturity models (Chapter 3). This will be followed by listing the method used, the results and findings, as well as a discussion of the results.

5.5.1 The Survey

A survey was created using the maturity models identified in Chapter 3. The goal of the survey was to determine the maturity of UX in South African PGs. The survey consisted of five sections, namely:

- Section 1: *Demographic information*. The staff members' PG, Directorate and job title;
- Section 2: *Nielsen's (2006) maturity model* (Discussed in Chapter 3, Section 3.4);
- Section 3: *Schaffer's (2004) maturity model* (Discussed in Chapter 3, Section 3.4);
- Section 4: *Feijo's (2010) maturity model* (Discussed in Chapter 3, Section 3.4);

- Section 5: *UX generic questions*. The questions were based on UX maturity questions from Human Factors International (2011), Ide-Smith (2011b) and Straub et al. (2009). The questions are listed in Table 5.4. The list of questions also included a list of usability and UX methods where participants were required to select those they have used.

The full survey is illustrated in Appendix C. The next sub-section discusses the method of the survey.

5.5.2 Method

This sub-section will discuss the participant profile, as well as the data collection method.

5.5.2.1 Participant Profile

The participant profile of this study was aimed at the nine PGs in South Africa. Table 5.3 listed the nine PGs together with their website addresses. The participants consisted of direct stakeholders of the government websites, such as Directors, Web Content Managers and Web Managers. The next sub-section describes how the participants were recruited and how data was collected.

5.5.2.2 Data Collection Method

An electronic survey was sent to each of the nine PGs. Participants were requested to participate in the survey and were given the opportunity to ask any questions they may have regarding the survey. Initially, in order to find the appropriate contacts or participants for each website, the website of each PG was searched for appropriate contact persons. It was a challenge for the author of this research to find contact details of the website custodians, webmasters, content managers or IT Departments on the websites. Only three PGs responded through this method and provided contact details of the responsible person to contact.

The South African National Department of Government Communication and Information System (GCIS) was subsequently contacted and the department provided a list of Web Content Managers for each PG website. The request to complete the survey was sent to the identified individual when a PG had a global website contact. The request was sent to the Department of the Premier in each PG when a PG did not have a global website contact. The results and findings of the survey are discussed in the next sub-section.

5.5.3 Results and Findings

The results of the survey (Pretorius and Calitz, 2012) are reported next.

5.5.3.1 Nielsen Maturity Model

The *Nielsen maturity model* (Chapter 3) consists of eight stages (Stage 1: hostility towards usability; Stage 8: user-driven corporation). Figure 5.7 illustrates how South African PGs rated on the Nielsen scale. The lowest rating was for the Gauteng, Eastern Cape, Limpopo, North Cape and North West PGs, stage 2; while the highest rating was for the Western Cape Government, stage 5.

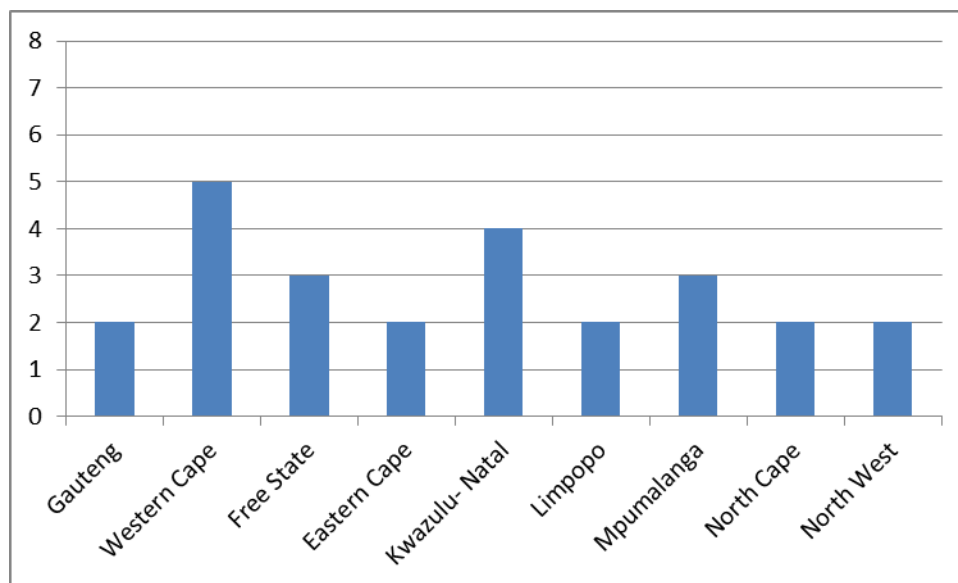


Figure 5.7: South African Provincial Government Results on the Nielsen (2006) Model

5.5.3.2 Schaffer Maturity Model

The *Schaffer maturity model* (Chapter 3) consists of six stages (level 0: clueless; level 5: routine usability). Figure 5.8 illustrates how South African PGs rated on the Schaffer scale. The lowest rating was for the Free State PG, level 0; while the highest rating was for Gauteng, Western Cape, Kwazulu-Natal and Mpumalanga PGs, level 2.

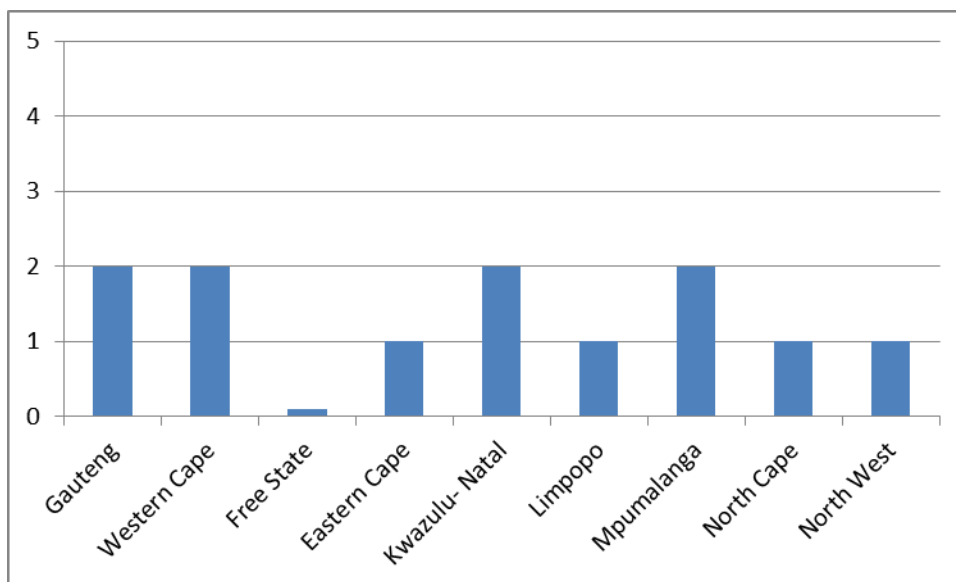


Figure 5.8: South African Provincial Government Results on the Schaffer (2004) Model

5.5.3.3 Feijo Maturity Model

The *Feijo maturity model* (Chapter 3) consists of six stages (level 1: unrecognised; level 6: embedded). Figure 5.9 illustrates how South African PGs rated on the Feijo scale. The lowest rating was for the Free State, Eastern Cape, Kwazulu-Natal, Limpopo, Mpumalanga, North Cape and North West PGs, level 2; while the highest rating was for the Gauteng and the Western Cape PGs, level 3.

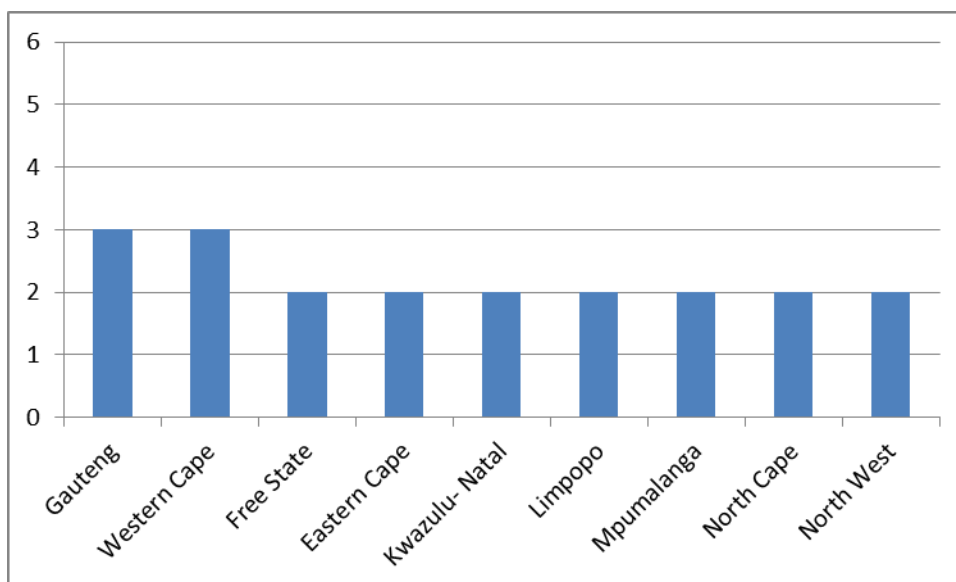


Figure 5.9: South African Provincial Government Results on the Feijo (2010) Model

5.5.3.4 UX Generic Questions

The survey concluded with a list of UX generic questions (listed in Table 5.4) compiled from UX maturity questions (Straub et al., 2009; Human Factors International, 2011; Ide-Smith, 2011b).

Table 5.4: User Experience Generic Questions Results		
Questions	Yes	No
Do you have usability and UX employees in your organisation?	4	5
Is usability and UX Design recognised as a unique and valued skill?	3	6
Do you have executive support?	4	5
Do you have a usability/UX strategy?	0	9
Is usability and UX a part of your development lifecycle (website)?	1	8
Are usability and UX exposure / training available to UX employees?	2	7
Are usability and UX exposure / training available to other employees?	1	8

The results of the questions indicated a lack of UX maturity in South African PGs. Five PGs do not have UX employees in the organisation. No PG has a UX strategy in place. Six PGs do not recognise UX design as a unique and valued skill. Five PGs do not have executive support. Only one PG has UX as a part of their development lifecycle for their website.

A checklist of UX methods was given to participants to select what UX methods they had used before. The most used UX methods listed were the following:

- Brainstorming;
- Benchmarking;
- Consistency inspection;
- Design guidelines;
- Guidelines checklist;
- Interface and Interaction design;
- Prototyping;
- Requirements gathering;
- Stakeholder meeting;
- Writing for the Web.

Sub-section 5.5.4 discusses the results reported in this section.

5.5.4 Discussion of Results

This study used three maturity models to rate the UX maturity of PGs in South Africa. Table 5.5 displays the lowest and highest ratings on each maturity model.

Model	Lowest Rating	Highest Rating
Nielsen (Stage 1 - 8)	2	5
Schaffer (Level 0 - 5)	0	2
Feijo (Level 1 - 6)	2	3

The maturity model results in Table 5.5 indicate that UX are not yet mature in South African PGs. PGs did not achieve high levels in the usability maturity models. These results were validated and supported by the list of UX generic questions. Six PGs noted that UX are not recognised as a valued skill. Only four PGs have UX employees in their organisation. None of the PGs have a UX strategy in place and only one PG has UX in their development lifecycle.

Sub-section 5.5.3.4 listed the UX methods currently used by PGs. Ide-Smith (2011a) describes the following UX methods and techniques as being the most effective (the number in brackets indicate the number of PGs who reported the use of these methods):

- Participatory design (2);
- Expert reviews (1);
- Prototyping (5);
- Interviews (3);
- Wireframes (3);
- Personas (2);
- Contextual enquiry (1);
- Usability testing (3);
- Sketching (1).

The methods used by the PGs (Sub-section 5.5.3.4) do not correspond well with this list, with only the prototyping method in both lists. The combined results of the maturity models and the UX questions indicate that the level of UX Maturity for website design in South African PGs is at a low level. The next section summarises the chapter.

5.6 Summary

Governments, worldwide, have made significant attempts to publicise information and services offered on the Internet (Kumar et al., 2007). An e-Government website is a key priority for governments when they develop their e-Government systems (Huang, 2010). Poor usability of government websites is a major obstacle in several countries (Wangpipatwong, Chutimaskul and Papasratom, 2008).

UX design refers to making products and services that are not only usable but also useful and appealing (Schaffer, 2004). Proper application of UX concepts and processes can help a government agency achieve a measurable return on its online investment and realise the full benefits of the digital age (Straub and Gerrol, 2008). Website usability is important for successful implementation of e-Government (Asiimwe and Lim, 2010). It is vital, therefore, for governments to make an effort to ensure that their websites are developed according to international standards (Asiimwe and Lim, 2010).

A need exists to measure how well organisations implement UX (Earthy, 1998). UX maturity models allow an organisation to measure its current level and to identify the level at which it wishes to be. Chapter 3 identified three models to be used in this study (Schaffer, 2004; Nielsen, 2006; Feijo, 2010). The research objective addressed in this chapter was:

RO3. Evaluate the maturity model level of UX in South African PGs.

South Africa has nine PGs each with its own e-Government website. A number of Web design and usability guidelines exists for South African e-Government websites; however, there are few signs that guidelines are being successfully implemented. It is challenging and onerous to implement these guidelines if there are no UX methodologies, executive buy-in, staff, budget or UCD processes. The research question addressed in this chapter was:

RQ3. What is the maturity model level of UX in South African PGs?

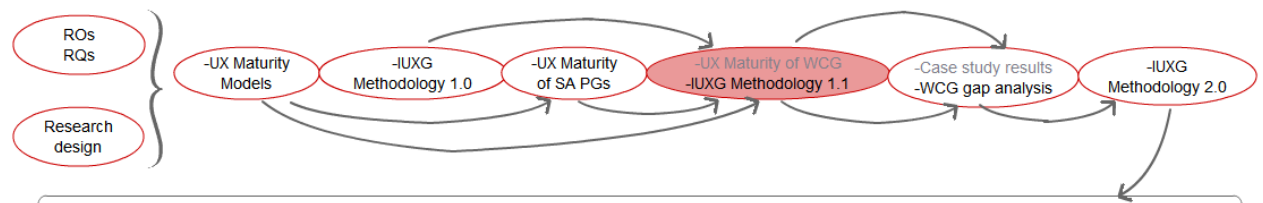
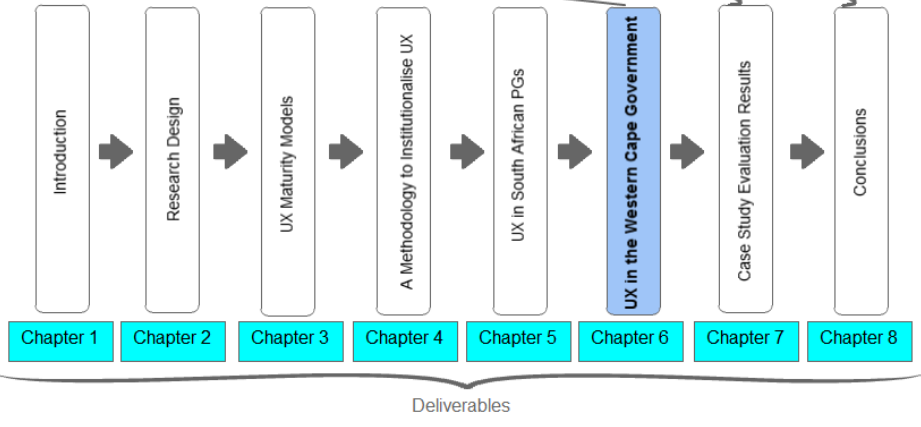
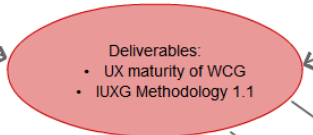
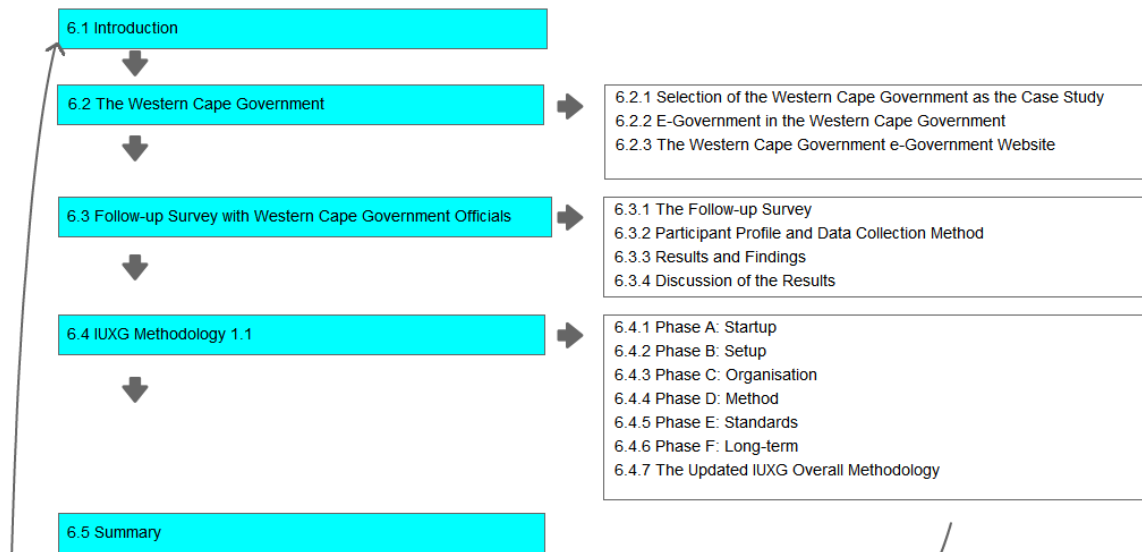
RQ3 was answered through a survey conducted to measure the UX maturity of South African PGs. The maturity model results indicated that UX is not yet mature in South African PGs. The majority of PGs were rated low in the maturity models. The PG with the highest rating in each model had at least three levels to progress before reaching the top step of each maturity model. These results were validated and supported by the list of UX generic questions: six do not recognise UX as a

valued skill; only four PGs have UX employees; no PGs have UX strategies in place and only one PG has UX forming part of its development lifecycle. Ease of use is one of the primary factors influencing a citizen's intention to use e-Government websites (Carter and Belanger, 2005). Government is clearly aware of this (Murray and Renaud, 2012); however, based on the survey results, this does not hold true for South African PGs.

HFI's 2009 UX Maturity Survey (Straub et al., 2009) indicates that stable, visible, internal usability and UX groups with executive support have become significantly more prevalent since Schaffer (2004) outlined the elements of a mature usability/UX practice. However, the results show that this statement does not hold true for South African PGs. UX is not at a mature level yet. It is impossible to take an organisation from UX indifference to UX maturity in a short time (Ide-Smith, 2011a). Professionals should focus on significant change through small victories by convincing the team of the need for UX approaches (Ide-Smith, 2011a).

The next chapter will validate these results by investigating the UX maturity of one South African PG (Western Cape Government) in more detail. The Institutionalise UX in Government (IUXG) methodology proposed in Chapter 4 will be updated in the following chapter in order to customise the methodology for South African PGs.

Chapter 6: User Experience in the Western Cape Government



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 6: User Experience in the Western Cape Government

6.1 Introduction

A number of guidelines and principles exist for e-Government website design (Chapter 5); however, there are indications that these guidelines and principles are not being fully applied by South African Provincial Government (PG) website designers. Guidelines cannot be implemented if there is no executive support, inadequately trained staff, insufficient budget or no use of usability methodologies and no use of user-centred design (UCD) processes. There is a need to measure how well user experience (UX) is implemented in organisations (Earthy, 1998). This measurement can be achieved by means of UX maturity models (Chapter 3). UX maturity models were used in a survey to measure the maturity level of South African PGs.

Chapter 5 discussed the results of the UX maturity model survey focusing on South African PGs. The results indicated that UX is not presently mature in South African PGs. The majority of PGs were rated low in the maturity models. The PG with the highest rating in each model had at least three levels to progress before reaching the highest step of each maturity model. The results further indicated that: six PGs do not recognise UX as a valued skill; only four PGs have UX employees; no PGs have UX strategies in place and only one PG has UX forming part of the development lifecycle.

The selected PG for this research is the Western Cape Government (WCG) (Sub-section 6.2.1). Progress has been made in implementing e-Government in the WCG, but several challenges still need to be addressed (Blessing and NtombovKlass, 2009). The results of the maturity model survey (Chapter 5) showed that UX forms part of these challenges for the WCG. The focus of this chapter is to investigate the level of UX in the WCG in more detail, by means of a follow-up survey with key WCG officials.

The Institutionalise UX in Government (IUXG) methodology is updated in this chapter after considerations of the follow-up survey results. A confirmation survey (Chapter 7) will demonstrate if the WCG had an improved UX maturity model level after implementing the IUXG methodology.

The research objectives addressed in this chapter are:

RO4a. Re-evaluate the maturity model level of UX in the WCG.

RO4b. Propose an updated methodology to institutionalise UX in a South African PG (IUXG 1.1).

The research questions addressed in this chapter are:

RQ4a. What is the current maturity model level of UX in the WCG?

RQ4b. What updated methodology should be proposed to institutionalise UX in a South African Provincial Government (IUXG 1.1)?

The first deliverable of this chapter is the results of the follow-up survey of the UX maturity level of the selected South African PG (WCG). The second deliverable of this chapter is an updated IUXG methodology to institutionalise UX in a South African PG (IUXG 1.1, as discussed in Chapter 2).

Section 6.2 will start with an introduction to the WCG; why the WCG was selected as the case study (Sub-section 6.2.1) and with a discussion of e-Government in the WCG (Sub-section 6.2.2). This is followed by a discussion of the WCG e-Government website (Sub-section 6.2.3). The status of UX in the WCG is investigated by means of a follow-up survey with key WCG officials (Section 6.3). The findings were used to update the IUXG methodology (proposed in Chapter 4), tailored towards a South African PG (Section 6.4). Section 6.5 summarises the findings of this chapter.

6.2 The Western Cape Government

The Western Cape is situated on the south western tip of the African continent (Figure 6.1) and is one of the nine provinces in South Africa. An estimated 5.8 million people live in the Western Cape on 129 462 km² of land (Statistics South Africa, 2012). The Afrikaans language is spoken by the majority of people, with isiXhosa and English being the other main languages (Statistics South Africa, 2012; Western Cape Government, 2012b).

The WCG is the PG that governs the Western Cape in South Africa by creating laws for and by providing services to the people of the Western Cape (Western Cape Government, 2012a). The WCG works closely with the national government and municipalities in the Western Cape to ensure that the citizens of the province have access to the services, facilities and information they require (Western Cape Government, 2012a).

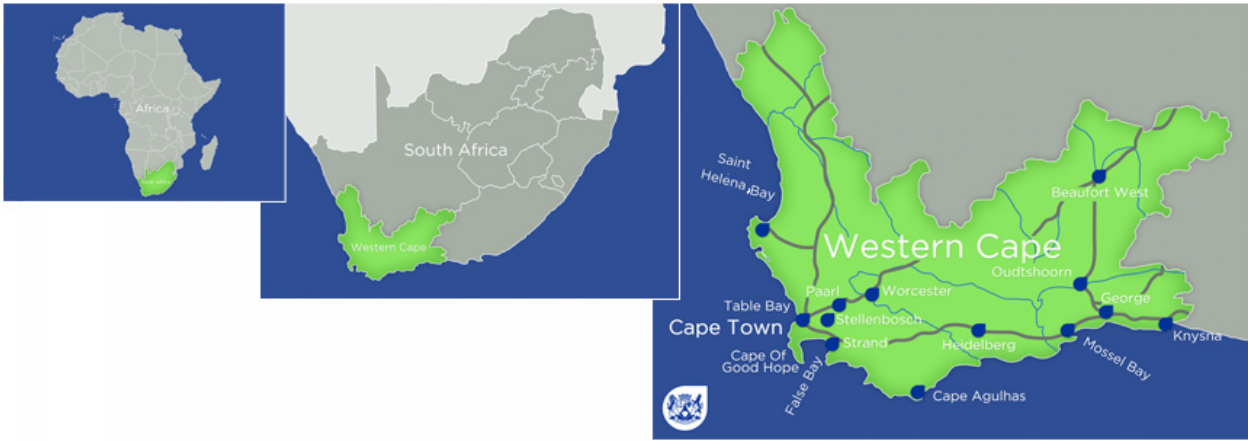


Figure 6.1: Location of the Western Cape

Source: Western Cape Government, 2012a: 1.

The vision of the WCG comprises an internal and external motivation (Western Cape Government, 2012c):

- *Internal motivation:* To be the best run regional government in the world;
- *External motivation:* To create an open opportunity society for all so that people can live lives they value.

One of the core values of the WCG is responsiveness: *“Our focus is the citizens: building relationships that allow us to anticipate their needs and deal with them proactively”* (Western Cape Government, 2012c: 3). Institutionalising UX in the PG, relates directly to the vision and core value of the WCG, which is, that UX is about the user (citizen).

The WCG consists of 13 departments, namely (Western Cape Government, 2012b):

- Department of Agriculture;
- Department of Community Safety;
- Department of Cultural Affairs and Sport;
- Department of Economic Development and Tourism;
- Department of Environmental Affairs and Development Planning;
- Department of Health;
- Department of Human Settlements;
- Department of Local Government;
- Department of Social Development;
- Department of Transport and Public Works;

- Department of the Premier;
- Provincial Treasury;
- Western Cape Education Department.

The departments are responsible for implementing laws and providing services to the people of the Western Cape (Western Cape Government, 2012b). Sub-section 6.2.3 discusses the website of the WCG; each department has a presence on the website and the contribution from these departments is a large percentage of the overall content on the WCG website. The next sub-section motivates the selection of the WCG as the case study for this research.

6.2.1 Selection of the Western Cape Government as the Case Study

A methodology to institutionalise UX in an organisation (IUXG methodology 1.0) was proposed in Chapter 4. The focus of this research is on South African PGs. The proposed IUXG methodology needs to be updated for the use of South African PGs. A South African PG had to be selected as the case study for this research.

The author of this research is based in Cape Town in the Western Cape Province (at the time of this research). The author is the Usability Team Leader in the WCG (as from July 2010). The role of the Usability Team Leader is to manage usability and UX in a component of the WCG: Department of the Premier, e-Government for Citizens (e-G4C). At the time of employment, UX was not institutionalised in the WCG. As the author was and presently is directly involved in institutionalising UX in the WCG, the WCG is selected as the case study for this research.

A UX maturity model survey was conducted as part of this research (Chapter 5) in 2011. The WCG was one of the top performers in this survey. At the time the survey was conducted, work on how to institutionalise UX in the WCG had already started. This is one of the reasons the WCG had higher UX maturity model ratings than other PGs. One of the goals of this chapter is to conduct a follow-up survey to re-evaluate the UX maturity model levels for the WCG for the period of 2009 to 2010 (before the institutionalisation exercise started). The case study (Chapter 7) will focus on UX work performed between 2010 and 2012 in the WCG.

6.2.2 E-Government in the Western Cape Government

Achieving effective e-Government is a main goal of the WCG (Western Cape Government, 2011a). The WCG internal vision: *being the best run regional government in the world*, was provided in the previous section. In order to achieve this vision, the WCG has several strategic goals. The strategic goal that speaks directly to this study is called Provincial Strategic Objective 12 (PSO12). An outcome of PSO12 is e-Government: *“Sustainable use of information and communication technologies to enable improved information and service delivery as well as to encourage citizen participation in decision-making”* (Western Cape Government, 2011a: 2).

An additional outcome of PSO12 is citizen-centric service delivery: *“Implementation of the citizen-centric philosophy by continuously improving citizens’ experience in their interaction with the Western Cape Government”* (Western Cape Government, 2011a: 2). A characteristic of PSO12 is described as *“a citizen-centric philosophy, enabling citizens’ access to government, improving consultation and providing a citizen-centred approach to service delivery”* (Western Cape Government, 2011a: 10). PSO12 states that the WCG does not currently have an institutionalised culture to consult citizens on their needs and then to assess whether these needs have been adequately addressed (Western Cape Government, 2011a). It is currently not general practice to measure citizen satisfaction for e-Government websites. UX is therefore a crucial requirement to meet these outcomes and characteristics in the online environment.

PSO12 also sets goals using current Internet trends. The following are listed in the PSO12 document (Western Cape Government, 2011a):

- Mobile access will be progressively improved to ensure that citizens are able to access and view webpages as well as to transact with government by mobile phone;
- Different types of social networking tools will be utilised to enable citizens to participate in government and to allow provincial departments to interact with citizens.

The WCG is endowed with a more advanced e-Government programme compared with other provinces in South Africa; however the programme lacks adequate resources needed for successful planning and implementation of individual e-Government projects (Blessing and NtombovKlass, 2009). The WCG e-Government programme has not established an effective policy framework (Blessing and NtombovKlass, 2009). PSO12 addresses the development of an e-Government strategy (Western Cape Government, 2011a). The WCG is currently re-writing the e-Government

strategy and this exercise is expected to be completed in early 2013. A new draft version was made available for public comment in October 2012 (Western Cape Government, 2012d).

The WCG started using Information and Communication Technologies (ICTs) to renew its economy, reform public administration and improve service delivery in 2001. The development of e-Government in the WCG was based on (Blessing and NtombovKlass, 2009):

- 2001 National e-Commerce Green Paper;
- 2000 Green Paper, Preparing the Western Cape for the Knowledge Economy of the 21st century;
- 2002 White Paper on e-Education.

The WCG supported the presidential drive for e-Government by launching an Internet portal in 2004 (SouthAfrica.Info, 2004). The e-Government website (portal) is discussed in the next subsection.

6.2.3 The Western Cape Government e-Government Website

The Western Cape Government website is a single point of access to government information and services for citizens of the Western Cape (Western Cape Government, 2012a). The website is managed by the Directorate: e-Government for Citizens (e-G4C), which forms part of the Department of the Premier (Western Cape Government, 2012a). E-G4C offers various channels to access government information, including (Western Cape Government, 2012a):

- *Internet:* www.westerncape.gov.za (was named www.capegateway.gov.za at the start of this research). Figure 1.1 (Chapter 1) illustrated the WCG home page at the beginning of this research study;
- *Intranet:* Internal staff website;
- *Cape Access:* Provide access to ICT to poor and rural communities across the Western Cape;
- *Contact centre:* The contact centre includes:
 - E-mail channel: service@westerncape.gov.za;
 - Call centre: 0860 142 142;
 - Walk-in centre: 142 Long Street, Cape Town;
 - The Presidential Hotline: 17737 (1 PRES).

The WCG is aware of the current digital divide and therefore provides information through different channels. The focus of this research will be on the Internet channel of e-G4C. All available channels should be used to engage with citizens (Walser, 2012). Institutionalising UX in the programme requires UX of the other channels to be considered; however, this is outside of the scope of this research.

The WCG website was once a leader of government websites, but has become less effective due to lack of ownership, lack of funding and investment, lack of clearly defined governance process, lack of long-term e-service strategy and lack of cross agency coordination and collaboration (Blessing and NtombovKlass, 2009). As a result, the website is not effectively used as a business tool (Blessing and NtombovKlass, 2009). High staff turnover at e-G4C has also contributed to e-Government stagnation in terms of its progress (Blessing and NtombovKlass, 2009).

The website initially started as the Cape Gateway Project. The Cape Gateway portal, which consisted of over 25 000 pages and documents related to government in 2004, was designed primarily for the following target audience (Vosloo, 2004):

- All online citizens of the Western Cape;
- Online businesses of the Western Cape.

Secondary users include (Vosloo, 2004):

- Non-profit organisations, which provide a vital channel for information exchange between government and citizens;
- Staff members of the Cape Gateway walk-in and call centres;
- Government staff.

A varied set of end-users, with different levels of Web literacy and education, different first and second languages and different information needs, exists (Vosloo, 2004). The portal was therefore made available in three languages: English, Afrikaans and Xhosa. A dedicated content team gathered and rewrote content from the 13 government departments and ministries.

At the time of the launch of the WCG portal in 2004, the following critical success factors were in place (Levin and Dingley, 2003):

- *Top-level support:* The overall online strategy was supported by a Minister as well as the Premier;
- *Stakeholder consultation:* The project recognised the importance of stakeholder consultation to ensure buy-in and participation for the process. Stakeholders were consulted at different levels of the provincial government and included top and senior management; the centralised Communications group; the IT Department (especially the team responsible for the website) and various other communications or role players in provincial departments that had their own websites;
- *Competent hybrid project team:* A strong team with a range of core competencies was required for such a forward-thinking and technologically-innovative project as the Cape Gateway Project. The core competencies that assisted the project team included deep, extensive skill sets and wide experience in: leadership, business knowledge, ICTs, usability and Web content. The project was purposely designed to be user-centric and usability-led, i.e. the overall team leader was the Usability Team Leader.

The WCG portal in addition faced the following challenges (Levin and Dingley, 2003):

- *Resistance:* In particular, there was resistance from departments which had invested resources in developing their own websites and infrastructure. Many public servants resisted change or were resistant and apathetic to providing information to the project. A possible solution was a content management system and supporting policy that prescribed minimum content requirements for content input, workflow and reporting;
- *Implementation gaps:* Despite broad consultation and the formation of a representative Portal Task Team, decisions within the team were not implemented effectively at lower levels within the departments. For example, although top management agreed to provide a basic set of minimum content, the project team struggled to obtain the agreed minimum content requirements from individuals tasked with this responsibility at lower levels;
- *Content issues:* The majority of the information content was written in "government speak" and had to be rewritten first in common English and then translated into simple language versions in Afrikaans and Xhosa.

The UX of government websites often does not compare well with the online experiences that citizens have in the private sector, as government does not keep up with the Web technology curve (Straub and Gerrol, 2008). The WCG website utilised old technologies, such as an old content

management system, for the Internet. The Intranet website also offers limited opportunity for improvement because of old technology.

After the launch of the WCG portal, the following recommendations for the long-term were made (Levin and Dingley, 2003):

- *Find a champion:* The project must be steered by a champion or champions at the highest political and administrative level;
- *Run awareness and change programmes:* In order to ensure that there is a smooth transition towards e-enabled government information provision and service delivery, there must be concurrent programmes of change management for senior government officials and for internal awareness creation programmes;
- *Obtain the right skills:* Specialised skills sets are required to undertake e-transparency information provision projects. The relatively high cost of these skills must not be underestimated. The following skills are recommended: open systems, content and standards development; business; leadership; usability; data modelling; multimedia design; project management; government content; online writing and systems engineering.

A phase two strategy document for the WCG e-Government website highlights the staffing requirements for the e-Government website component (Higgo, 2004). The staffing requirements are illustrated in Figure 6.2. The main groupings listed are usability and design, content and technology. It is important to observe that a Design and Usability Manager is recommended; however, this is only one person, without a team. This does not correspond to the number of UX roles required as described in the proposed IUXG methodology (Chapter 4). The recommended roles in the IUXG methodology were: an information architect, user researcher, interaction designer and graphic designer.

Higgo (2004) cautions against the implementation of the portal requirements without full staff capacity, as a risk. In government, possible staffing problems include posts that are not institutionalised in government (Higgo, 2004). This could have a major impact on UX staff, as UX is a relatively unfamiliar field in South African government (with the maturity survey listing few current UX positions in PGs). Other possible staffing problems include low remuneration and the fact that posts are not permanent, but on contract (Higgo, 2004). UX in the WCG are discussed in further detail in Section 6.3. The follow-up survey with WCG officials is discussed next.

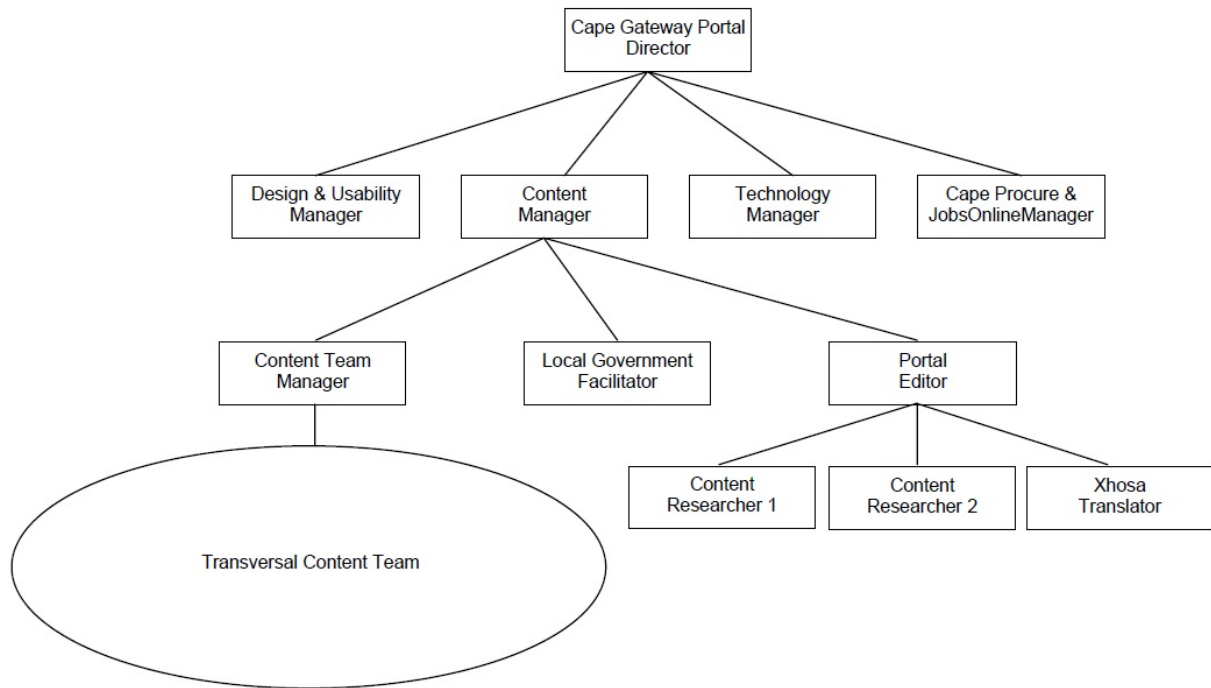


Figure 6.2: WCG Portal Phase 2 Staff Requirements

Source: Higgs, 2004: 40.

6.3 Follow-up Survey with Western Cape Government Officials

The goal of Chapter 5 was to conduct a survey regarding the UX maturity level of South African PGs. The WCG was selected as the case study for this research. The goal of this section is to conduct a follow-up survey with more WCG officials to examine UX in the WCG in more detail.

6.3.1 The Follow-up Survey

The goal of the follow-up survey is to analyse the maturity level of UX in the WCG in more detail with more participants. The follow-up survey will consist of:

- *Nielsen's (2006) maturity model*: Discussed in Chapter 3, Section 3.4;
- *Schaffer's (2004) maturity model*: Discussed in Chapter 3, Section 3.4;
- *Feijo's (2010) maturity model*: Discussed in Chapter 3, Section 3.4;
- *UX Generic questions categorised into the proposed methodology (Chapter 4) main steps*: The questions are taken from the original UX generic question listed in Chapter 5, the survey results from Chapter 5, the literature in Section 6.2 and the main steps of the proposed IUXG methodology (Chapter 4).

6.3.2 Participant Profile and Data Collection Method

The participant profile of this study was aimed at key WCG officials working closely with the website. The participants included:

- *Director:* The Director manages the e-G4C Directorate and is responsible for the WCG Internet websites;
- *Technical Team Leader:* The Technical Team Leader manages the development of the WCG Internet websites;
- *Internet Programme Manager:* The Internet Programme Manager manages the approval and development of citizen-facing websites and online presences for the WCG;
- *Managing Editor:* The Managing Editor is overall responsible for ensuring high-quality online content produced by the WCG;
- *Project Manager:* The Project Manager is an external consultant and project manager of WCG Internet website projects.

The five officials listed above are the staff closely involved with the WCG website. These officials are all senior officials who would be able to answer the questions in the survey. No more senior officials are available who are as closely involved with the website. Available junior officials were not used as they may not be able to answer many of the questions (such as strategy and staff requirements).

The first survey (Chapter 5) was answered by one of the officials listed above. The follow-up survey was answered by the five officials listed above. Each official was approached in person and informed of the follow-up survey and the need for it. The follow-up survey was conducted by means of a personal interview with each WCG official.

The data analysis of the follow-up survey was completed by grouping results into categories. The categories of the proposed IUXG methodology were used. Patterns and relationships were identified in the data in order to reach conclusions. The data is presented in a narrative summary (Table 6.1). The next sub-section describes the results and findings of the follow-up survey.

6.3.3 Results and Findings

The results of the follow-up survey are listed in Table 6.1. The table provides the results for:

- 2009-2010: The timeline before the institutionalisation exercise had started. The Usability Team Leader joined the website team in July 2010. One participant did not comment on 2009-2010 as the participant had not yet joined the WCG at that time;
- It is important to note that the results for the WCG as explained in Chapter 5 are not listed in Table 6.1. The results for the WCG and other PGs discussed in Chapter 5 relate to findings of 2011. The 2011 WCG results are discussed in more detail in Chapter 7, together with the results from 2012.

The results listed in Table 6.1 are discussed in Sub-section 6.3.4.

Table 6.1: Follow-up Survey Results for the WCG (2009-2010)		
Questions		2009-2010 Results
1.	Nielsen MM (Stage 1 – 8)	Stage 1: n=1; Stage 2: n=1; Stage 4: n=2; N/A: n=1.
2.	Schaffer MM (Level 0 – 5)	Level 0: n=2; Level 1: n=1; Level 2: n=1; N/A: n=1.
3.	Feijo MM (Step 1 – 6)	Level 1: n=1; Level 2: n=3; N/A: n=1.
STARTUP		
4.	Do you have executive support?	Yes: n=2; No: n=1; N/A: n=2.
5.	Are usability and UX Design recognised as unique and valued skills?	Yes: n=4 (emerging awareness); N/A: n=1.
6.	When the portal was launched, the following challenges were faced: resistance; implementation gaps; technology issues and content issues (Levin and Dingley, 2003). What challenges are you facing?	<ul style="list-style-type: none"> • Lack of understanding of usability; • No awareness that usability needs to be part of the development process; • No budget; • No Usability Team Leader; • No UX posts; • Need to be more citizen-centric; • No direct feedback from users; • Procurement issues; • Licensing of the content management system (CMS); • Legacy systems were a barrier to improvements to usability; • The UX work that was outsourced had problems with project delivery issues and implementation delays.
7.	Are there any usability wake-up calls? (train wreck projects, executive insights; new staff; education; expert reviews; usability testing and new technologies)	<ul style="list-style-type: none"> • There was an opportunity to restructure the organisation and there was a realisation that the website has to be more user-centric; • Web 2.0 forced WCG to change business processes to involve users; • Top level staff asking for the site to be “<i>user-friendly</i>”;

Table 6.1: Follow-up Survey Results for the WCG (2009-2010)		
Questions		2009-2010 Results
		<ul style="list-style-type: none"> • Training of staff on the existing legacy system was very challenging as the CMS was unusable; • Homepage was a catastrophe; information could not be found; • There were more wake-up calls when the Usability Team Leader arrived in July 2010. The Usability Team Leader evangelised UX; • People (internal and external) were not using the website; • Internal standard of usability outside e-G4C was extremely low. There was no recognition of usability outside of e-G4C.
SETUP		
8.	Do you have a usability/UX strategy?	No: n=4; N/A: n=1.
9.	What policies, strategies or guidelines are in place?	Nothing: n=1; N/A: n=1; Items listed below: n=2: <ul style="list-style-type: none"> • Technology-related policies; • New CMS research and standard; • Old content guidelines; • Old visual guidelines.
10.	What policies, strategies or guidelines need to be in place? (overall question – not year specific)	<ul style="list-style-type: none"> • Content policy, strategy and guidelines; • UX policy, strategy and guidelines; • Branding policy, strategy and guidelines; • Wireframe and design templates; • Clear workflows; • Content ownership; • Training guidelines: including training on CMS, principles for writing for the Web, optimising media for the Web; • E-Government strategy; • Website strategy; • Mobile policy and strategy; • Social media policy and strategy; • Web development and maintenance policy.
11.	Are usability and UX a part of your development lifecycle (website)?	Yes: n=2 (started); No: n=1; N/A: n=2.
12.	Are usability and UX exposure / training available to UX employees?	Yes: n=1; No: n=2; N/A: n=2.

Table 6.1: Follow-up Survey Results for the WCG (2009-2010)		
Questions		2009-2010 Results
13.	Are usability and UX exposure / training available to other employees?	Yes: n=1; No: n=2; N/A: n=2.
14.	Are UX methods used?	Yes: n=2 (started); No: n=1 (not formally); N/A: n=2.
ORGANISATION		
15.	What type of organisational structure is used (matrix, centralised, decentralised)?	N/A: n=3; Only consultants in place: n=1; Decentralised: n=1.
16.	Do you have usability and UX employees in your organisation? If so, how many team members are there and what are their roles?	No: n=3 (However, Usability Team Leader arrived in mid-2010); N/A: n=2.
17.	What overall skills and staff need to be in place? (overall question – not year specific)	<ul style="list-style-type: none"> • UX: <ul style="list-style-type: none"> ○ Information Architect, Web Designer, Usability Team Leader; • Content: <ul style="list-style-type: none"> ○ Managing Editor/Senior Content Manager (someone senior enough to get buy-in from other areas); ○ Content Strategist; ○ Online Editors; ○ Social Media Managers; ○ Translators; ○ Online Content Managers for each unit that has an online presence; • Technology: <ul style="list-style-type: none"> ○ Versatile Tech team (social, mobile, Web, different CMS standards, infrastructure and hosting); ○ Testing (test manager, test engineers); ○ Tech manager, Application Development Managers, Team Leaders, Solution Architects, Developers (mobile, Customer Relationship Management (CRM), SharePoint, Microsoft), System Administrators, Scrum Master; • Project management; • Business Analysts; • Change management; • Stakeholder management; • Training; • Communications; • Website Manager;

Table 6.1: Follow-up Survey Results for the WCG (2009-2010)		
Questions		2009-2010 Results
		<ul style="list-style-type: none"> • Procurement Specialists; • Executive support.
METHOD		
18.	Are there projects where a need for UX has been identified?	Yes: n=3 (Portal needs to be “ <i>user-friendly</i> ”); N/A: n=2.
19.	What type of websites exists?	<ul style="list-style-type: none"> • e-Government; • Informational.
20.	Is there a project agreement/proposal?	Yes: n=2; No: n=1; N/A: n=2.
21.	Is there project planning?	Yes: n=2; No: n=1; N/A: n=2.
22.	Are business requirements implemented?	Yes: n=2 (need improvement); No: n=1; N/A: n=2.
23.	Is user research conducted?	Yes: n=2 (not all stakeholders; need improvement); No: n=1; N/A: n=2.
STANDARDS		
24.	Do you make use of templates?	No: n=3; N/A: n=2.
25.	Do you have a usability testing facility?	No: n=3; N/A: n=2.
26.	Is UCD a standard?	No: n=3; N/A: n=2.
27.	Do you follow UX best practices and guidelines?	No: n=2; N/A: n=3.
LONG-TERM		
28.	Are there any specific laws and regulations that need to be considered?	<ul style="list-style-type: none"> • The Constitution (national and provincial); • Promotion of Access to Information Act (PAIA); • Promotion of Administrative Justice Act (PAJA); • Public Servant Code of Conduct; • Batho Pele Principles; • Provincial Government values; • Provincial Strategic Objectives; • Consumer Protection Act; • Government Communication and Information System (GCIS) editorial guidelines; • Minimum Information Security Act; • Public Finance Management Act (PFMA); • State Information Technology Agency (SITA) Act; • Electronic Communications and Transactions Act; • Nothing for UX (unlike the USA which has an

Table 6.1: Follow-up Survey Results for the WCG (2009-2010)		
Questions		2009-2010 Results
		accessibility law).
29.	What current trends are being looked at and should be looked at in the future? (overall question – not year specific)	<ul style="list-style-type: none"> • Mobile and responsive design; • Social media (changing the way users interact with government); • Semantic Web (Web 3.0); • CRM (become far more familiar with your clients, proactive to deal with their needs); • Transactional (not all financial) (more services, back-office integration); • Integrate usability into the SDLC; • User generated content (Web 2.0); • Application Programme Interface (API) and open data; • Multimedia (video, audio, infographics); • Online Reputation management; • Open source (national policy, international recommendation); • Agile development; • IT governance.
30.	What recommendations can you make for the success of the WCG website in the long-term? (overall question – not year specific)	<ul style="list-style-type: none"> • Strongly governed. Sound policy base, supported at the highest level; • Strong executive support; • Integrate usability into SDLC. Have a consistent, clear and repeatable website development lifecycle. User-centred design; • Institute mechanisms for QA; • Change management; • Invest in good business requirements (business does not always understand itself); User requirements; • Good business processes; • Vision; • Content ownership; • Properly resourced (people, financial, equipment, facilities). Permanent posts established to ensure long-term maintenance of websites; • Adequate funding; • Content strategy: COPE (create once publish everywhere; Separate content from presentation); • Semantic Web; • Must be easy to use; • Have a flexible development platform; • Create better digital inclusion; • Plan and prioritise projects.

6.3.4 Discussion of the Results

The previous sub-section listed the results of the UX maturity model and questions for the WCG (2009-2010) in Table 6.1. This sub-section discusses these results. The maturity model results were as follows (the number of participants indicated in brackets):

- **Nielsen (2006) maturity model (consists of eight stages):**
 - 2009-2010:
 - Stage 1: Hostility towards usability (n=1);
 - Stage 2: Developer-centred usability (n=1);
 - Stage 4: Dedicated usability budget (n=2);
- **Schaffer (2004) maturity model (consists of six stages):**
 - 2009-2010:
 - Level 0: Clueless (n=2);
 - Level 1: Piecemeal usability (n=1);
 - Level 2: Managed usability (n=1);
- **Feijo (2010) maturity model (consists of six stages):**
 - 2009-2010:
 - Level 1: Unrecognised (n=1);
 - Level 2: Interested (n=3).

The 2009 to 2010 results show that participants do not all agree on the level of UX maturity. The Nielsen maturity model listed three different stages, the Schaffer maturity model three different levels and the Feijo maturity model two different levels. Despite the fact that not all answers are the same, the levels of UX maturity indicated by participants are still low. Each model, for the participants who scored the highest, had between three and four more stages/levels to reach the final stage/level. Each maturity model had participants scoring the level of UX maturity at the lowest possible level.

A solution to inconsistent answers from participants is for a UX consultant to complete the maturity level analysis in consultation with the stakeholders (listed in the updated IUXG methodology). The maturity level scores given by the WCG Usability Team Leader will be included in the 2012 survey (Chapter 8). The 2009 to 2010 maturity level scores given by the WCG Usability Team Leader are listed in Chapter 7.

The startup phase results included:

- The majority of participants said that there was executive support;
- UX started to emerge as a recognised, unique and valued skill;
- Challenges during this time were identified and included a lack of understanding of usability, UX and UCD and a lack of UX staff and leadership.

The setup phase results included:

- There was no UX strategy;
- Policies, strategies and guidelines that need to be in place were identified in the survey. UX and content policies, strategies and guidelines were included;
- One participant stated that UX was not part of the development lifecycle, while two participants stated that UX was starting to be used. The WCG SDLC will be examined in more detail in Chapter 7.

The organisation phase results included:

- There were no UX employees in the organisation; the Usability Team Leader only arrived in mid-2010;
- Skilled staff that were identified in the survey had to be appointed throughout the organisation. These included UX, content and technology staff, as well as project managers, business analysts and change managers.

The method phase results included:

- A need for UX was identified for the WCG website: *“The website needs to be user-friendly”*;
- The website is an e-Government website that is mostly informational;
- The majority of participants said that project planning is conducted and that there is a project proposal. Business requirements are being developed, but need improvement. User research is conducted, but not with all stakeholders and thus needs improvement.

The standards phase results included:

- Templates or UX best practices and guidelines were not used;
- There was no usability testing facility;
- UCD was not a standard.

The long-term phase results were as follows:

- Laws and regulations were identified in the survey that need to be considered when building an e-Government website;
- Current and future trends were identified in the survey. These included trends in mobile and in social media;
- Finally, recommendations for the future success of the WCG website were given.

Table 6.2 addresses the topics or challenges discussed above and how they will be addressed in the updated IUXG methodology. The table columns indicate:

- The topics or challenges identified in the WCG literature or in the WCG follow-up survey;
- The reference(s);
- If the current IUXG methodology (1.0) addresses the topic or issue;
- What will be included in the updated IUXG methodology.

The table is divided into the relevant IUXG methodology sections, as was the case in Table 6.1. Certain topics or issues may have an overlap; in those cases, the most relevant section was selected.

Table 6.2: Follow-up Survey Topics and Challenges to be Addressed in the Updated IUXG Methodology			
Topics or challenges	Reference	Already Addressed in the Methodology?	Not Addressed in the methodology, new step
STARTUP			
Top-level support: find a champion. Strong executive support.	Levin and Dingley, 2003; Survey	<i>Phase A: Startup:</i> Acquire an executive champion.	-
Awareness. Lack of understanding of usability. No awareness that usability needs to be part of the development process. Resistance.	Levin and Dingley, 2003; Survey	<i>Phase A: Startup:</i> Obtain buy-in. <i>Phase B: Setup:</i> Define general UCD approach.	-
Maturity model results: inconsistency.	Survey	-	Update <i>Phase A: Startup:</i> Measure UX maturity level. A UX consultant should conduct the survey.
SETUP			
Integrate usability into the SDLC.	Survey	<i>Phase B: Setup:</i> Define general UCD approach. <i>Phase E: Standards:</i> Standardise processes.	-
Direct user input. Need to be more citizen-centric. No direct feedback from users.	Survey	<i>Phase B: Setup:</i> Define general UCD approach. <i>Phase E: Standards:</i> Standardise processes.	-
Budget. Lack of funding and investment. Adequate funding.	Blessing and NtombovKlass, 2009; Survey	<i>Phase A: Startup:</i> Obtain buy-in. Obtaining buy-in will make it easier to obtain a budget for UX.	Update <i>Phase B: Setup.</i> Include a budget step.

Table 6.2: Follow-up Survey Topics and Challenges to be Addressed in the Updated IUXG Methodology			
Topics or challenges	Reference	Already Addressed in the Methodology?	Not Addressed in the methodology, new step
Procurement challenges.	Survey	-	Update <i>Phase B: Setup</i> . Include a procurement step.
Policies, strategies and guidelines.	Survey	<i>Phase B: Setup</i> : Create a strategy.	Update <i>Phase B: Setup</i> : Create a strategy. Include: UX policy, strategy and guidelines. Include a new step in <i>Phase B: Setup</i> to list overall supporting policies, strategies and guidelines: <ul style="list-style-type: none"> • Content policy, strategy and guidelines; • Branding policy, strategy and guidelines; • CMS training guidelines; • Website strategy; • Mobile policy and strategy; • Social media policy and strategy; • Web development and maintenance policy.
Lack of clearly defined governance process. Clear workflows are needed. Strong governance.	Blessing and NtombovKlass, 2009; Survey	<i>Phase B: Setup</i> : Define general UCD approach. <i>Phase E: Standards</i> : Standardise processes.	-
ORGANISATION			
Staff: UX. No usability team leader. No UX posts.	Levin and Dingley, 2003; Higgo, 2004; Survey	<i>Phase C: Organisation</i> : Define and recruit UX staff.	<i>Phase C: Organisation</i> : Define and recruit UX staff. Add additional post: UX team leader.
Staff: other.	Levin and Dingley, 2003; Higgo, 2004; Survey	<i>Phase C: Organisation</i> : Support required from other staff.	<i>Phase C: Organisation</i> : Support required from other staff. Update the list according to roles identified in Table 6.1.

Table 6.2: Follow-up Survey Topics and Challenges to be Addressed in the Updated IUXG Methodology			
Topics or challenges	Reference	Already Addressed in the Methodology?	Not Addressed in the methodology, new step
Sufficient staff resources. Retaining staff: low remuneration and posts not being permanent, but on contract.	Levin and Dingley, 2003; Higgo, 2004; Survey	<i>Phase A: Startup:</i> Obtain buy-in. <i>Phase A: Startup:</i> Acquire an executive champion. <i>Phase C: Organisation:</i> Define and recruit UX staff.	-
Problems with contractors.	Survey	<i>Phase C: Organisation:</i> Using contractors.	-
METHOD			
Content ownership. Lack of ownership.	Levin and Dingley, 2003; Blessing and NtombovKlass, 2009; Survey	<i>Phase D: Method:</i> Create a proposal: Ownership.	Update <i>Phase D: Method.</i> Plan the project. Include a sub-step to define roles and responsibilities.
Stakeholder consultation. Lack of cross agency coordination and collaboration.	Levin and Dingley, 2003; Blessing and NtombovKlass, 2009	<i>Phase A: Startup:</i> Obtain buy-in. <i>Phase D: Method:</i> Develop business requirements.	-
Plan and prioritise projects.	Survey	<i>Phase D: Method:</i> Plan the project.	Update <i>Phase D: Method:</i> Plan the project. Include a prioritisation sub-step.
Better business requirements.	Survey	<i>Phase D: Method:</i> Develop business requirements.	-
Change management. Run change programmes.	Levin and Dingley, 2003; Survey	<i>Phase D: Method:</i> Deliver support after the launch: Implement change management.	-
Technical issues: <ul style="list-style-type: none"> • Implementation gaps; • Licensing of the content management system; • Legacy systems were a 	Levin and Dingley, 2003; Survey	-	The technical development of the website is not the focus of the study. However, with the issues listed, development needs more attention than in the current IUXG methodology.

Table 6.2: Follow-up Survey Topics and Challenges to be Addressed in the Updated IUXG Methodology			
Topics or challenges	Reference	Already Addressed in the Methodology?	Not Addressed in the methodology, new step
barrier to improvements in usability; <ul style="list-style-type: none"> • Have a flexible development platform; • Institute mechanisms for QA. 			Update <i>Phase D: Method</i> . Include “ <i>Develop the site</i> ” as a main step in the method phase.
STANDARDS			
Wireframe and design templates.	Survey	<i>Phase E: Standards:</i> Create templates.	-
LONG-TERM			
Laws and regulations.	Survey	<i>Phase F: Long-term:</i> Adhere to laws and regulations.	Also include in <i>Phase F: Long-term:</i> Adhere to laws and regulations. Update the list to include laws and regulations identified in Table 6.1.
Run awareness programmes.	Levin and Dingley, 2003	<i>Phase A: Startup:</i> Obtain buy-in.	Update <i>Phase F: Long-term</i> . Include a new step specifying that UX awareness should be on-going.
e-Government strategy.	Blessing and NtombovKlass, 2009; Western Cape Government, 2011a; Survey	<i>Phase A: Startup:</i> Obtain buy-in. Focus on e-Government act.	Also include in <i>Phase F: Long-term:</i> Adhere to laws and regulations. Include e-Government strategy.
Mobile. Create better digital inclusion.	Western Cape Government, 2011a; Survey	-	Include in <i>Phase F: Long-term:</i> Stay up to date with latest trends and research. Include mobile as a trend. Mobile devices and applications can bridge the digital divide (Macharia, 2011).

Table 6.2: Follow-up Survey Topics and Challenges to be Addressed in the Updated IUXG Methodology			
Topics or challenges	Reference	Already Addressed in the Methodology?	Not Addressed in the methodology, new step
Social media.	Western Cape Government, 2011a	<i>Phase D: Method:</i> Launch the site: Create social media accounts.	Include in <i>Phase F: Long-term:</i> Stay up to date with latest trends and research. Include social media as a trend. Social media can also assist in bridging the digital divide (Goldstuck, 2012).
More trends (list identified in Table 6.1).	Survey	Include in <i>Phase F: Long-term:</i> Stay up to date with latest trends and research.	Include in <i>Phase F: Long-term:</i> Stay up to date with latest trends and research. Include a list with more trends that should be considered (as in Table 6.1).

6.4 IUXG Methodology 1.1

Table 6.2 listed the topics and challenges resulting from the WCG literature and the follow-up survey conducted with WCG officials. These topics and challenges were considered for the IUXG methodology. Table 6.2 recommended the steps that should be included. This section highlights the changes and updates the steps in the IUXG methodology phases. The IUXG methodology process is explained in terms of phases, steps and sub-steps. For example:

- **Phase A: Startup.** The main components (Phase A, Phase B, etc.) are referred to as phases;
- Phase A: Startup: **Measure UX maturity level.** These components are referred to as steps;
- Phase A: Startup: Measure UX maturity level: **Select a maturity model.** These components are referred to as sub-steps.

Sub-section 6.4.7 provides the updated overall IUXG methodology.

6.4.1 Phase A: Startup

The following updates were made to Phase A, Startup:

- Update step A1: *measure UX maturity level*:
 - The maturity model results showed inconsistent results between officials. The maturity model levels can be measured by officials, working closely with the website, to get an idea of where they are and where they need to be. However, for an accurate score, the maturity level results should be conducted by a UX consultant in discussion with government officials;
- Update step A2: *measure usability of current site*:
 - A UX consultant should also be used to measure the usability of the current site.

Figure 6.3 illustrates the updated Phase A, Startup as discussed above.

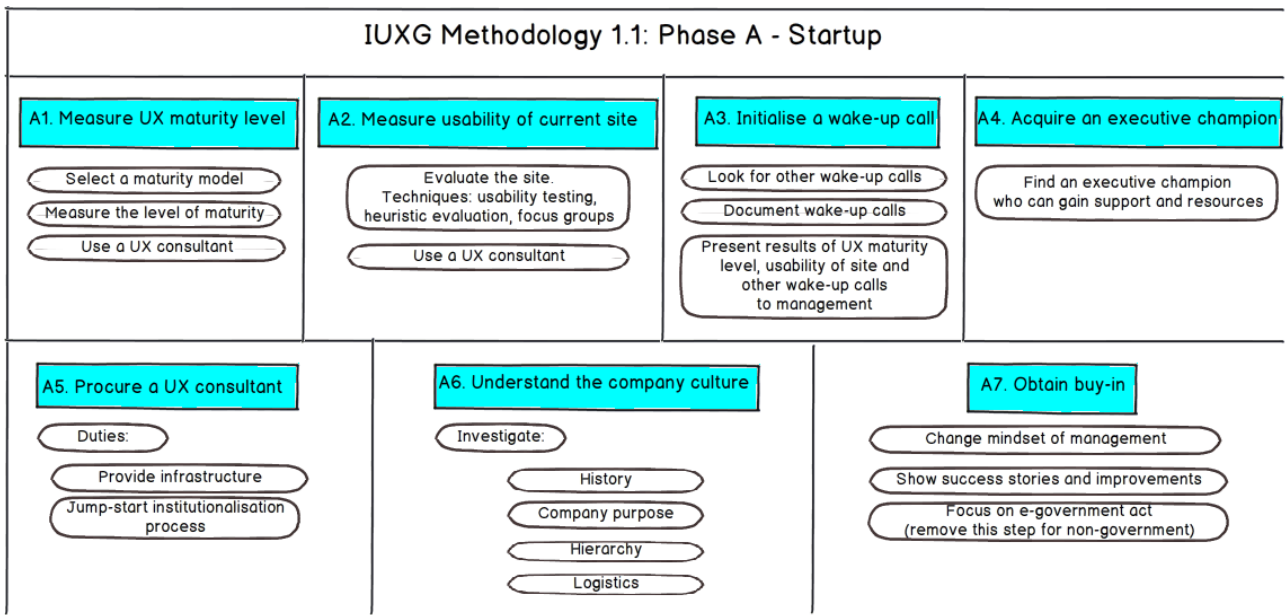


Figure 6.3: IUXG Methodology 1.1: Phase A - Startup

6.4.2 Phase B: Setup

The following new steps and updates were made to Phase B, Setup:

- Update step B1: *create a strategy*. Include UX policy, strategy and guidelines:
 - The previous IUXG methodology only mentioned “*create a strategy*”. This step is updated to be UX specific and to include policy and guidelines. E-G4C uses the following descriptions for policy and strategy: *a policy states what we do; a strategy states how we do it*;
- New step: include *overall supporting policies, strategies and guidelines* step (B2):
 - The follow-up survey results indicated that several other policies, strategies and guidelines are required in order to make a website successful. A new step is included to list these policies, strategies and guidelines. They are not the focus of this study, but it is important for a UX practitioner to take note of them, as they may influence UX work. There is a lack of policies and strategies in South African PGs with regard to content, mobile and social media (Levy, 2012c);
- New step: include a *budget* step (B4):
 - The WCG literature and follow-up survey results indicated that a lack of adequate budget was a problem. One of the first steps of the IUXG methodology “*Phase A: Startup: Obtain buy-in*” is significant for executives to realise that UX is important and hence requires a budget. The goal of this step is to create a formalised budget for UX;

- New step: include a *procurement* step (B4):
 - The follow-up survey results indicated that procurement is a problem within the government. A step is created in the IUXG methodology where the team, using the IUXG methodology, needs to understand the procurement process in government. The case study results (Chapter 7) will provide more information on how this step can be expanded. The budget and procurement steps are combined as one step in Figure 6.4.

Figure 6.4 illustrates the updated Phase B, Setup as discussed above.

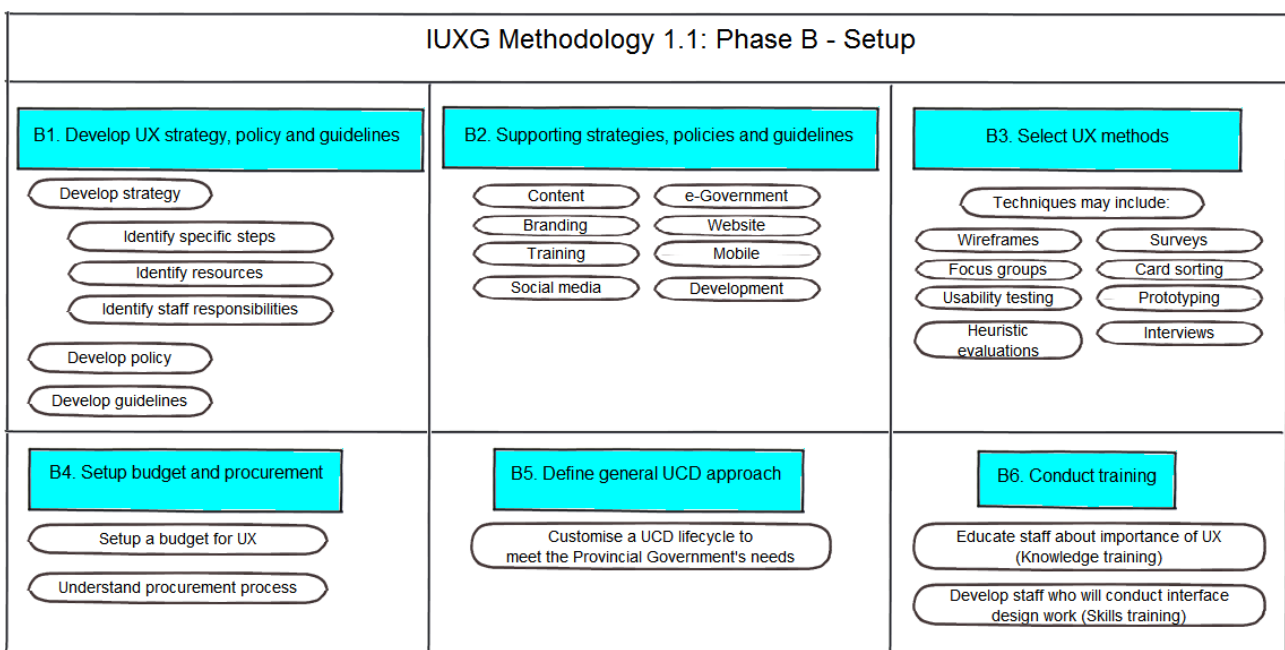


Figure 6.4: IUXG Methodology 1.1: Phase B - Setup

6.4.3 Phase C: Organisation

The following updates were made to Phase C, Organisation:

- Update step C2: *define and recruit UX staff*. Add an additional post: UX team leader:
 - The WCG literature and follow-up survey results indicated that a leader is required to manage the UX team;
- Update step C3: *support required from other staff (other roles)*:
 - The WCG literature and follow-up survey results identified several staff roles that need to be in place in order for the e-Government website to be successful. These roles are not the focus of this study, but it is important for a UX practitioner to take

note of them, as these staff members will work closely with the UX team. The UX team is also dependent on the support provided by other staff. Figure 6.5 illustrates the other, identified, staff roles.

Figure 6.5 illustrates the updated Phase C, Organisation as discussed above.

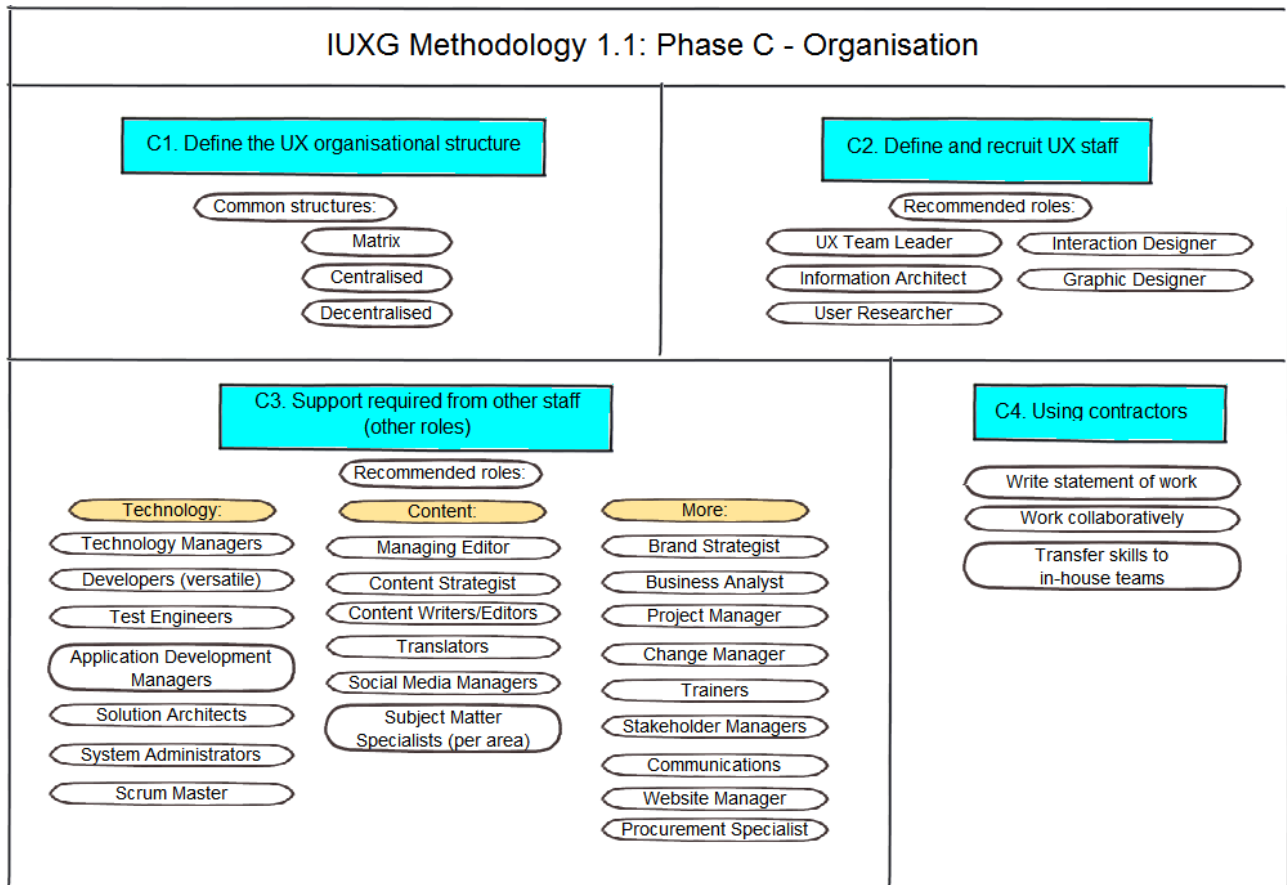


Figure 6.5: IUXG Methodology 1.1: Phase C - Organisation

6.4.4 Phase D: Method

The following updates were made to Phase D, Method:

- Update step D4: *plan the project*.
 - Include a sub-step to define roles and responsibilities: The WCG literature and the follow-up survey results showed that a lack of ownership, specifically in the content area, was a problem. Defining the roles and responsibilities at the start of a project will address this problem;

- Include a prioritisation sub-step: The follow-up survey results recommended that “*plan and prioritise projects*” are important. Determining the priority of a project is especially important when many projects need to be delivered;
- Update the sub-step: *develop the site* as a main step (D8) in the method process:
 - The technical development of the site is not the focus of the study; however, with the issues listed in the follow-up survey, development needs more attention than in the current IUXG methodology. It is therefore included as a main step in the method phase.

Figure 6.6 illustrates the updated Phase D, Method as discussed above.

6.4.5 Phase E: Standards

Figure 6.7 illustrates the Standards phase of the IUXG methodology. Based on the WCG literature and follow-up survey results, no changes were made to this phase.

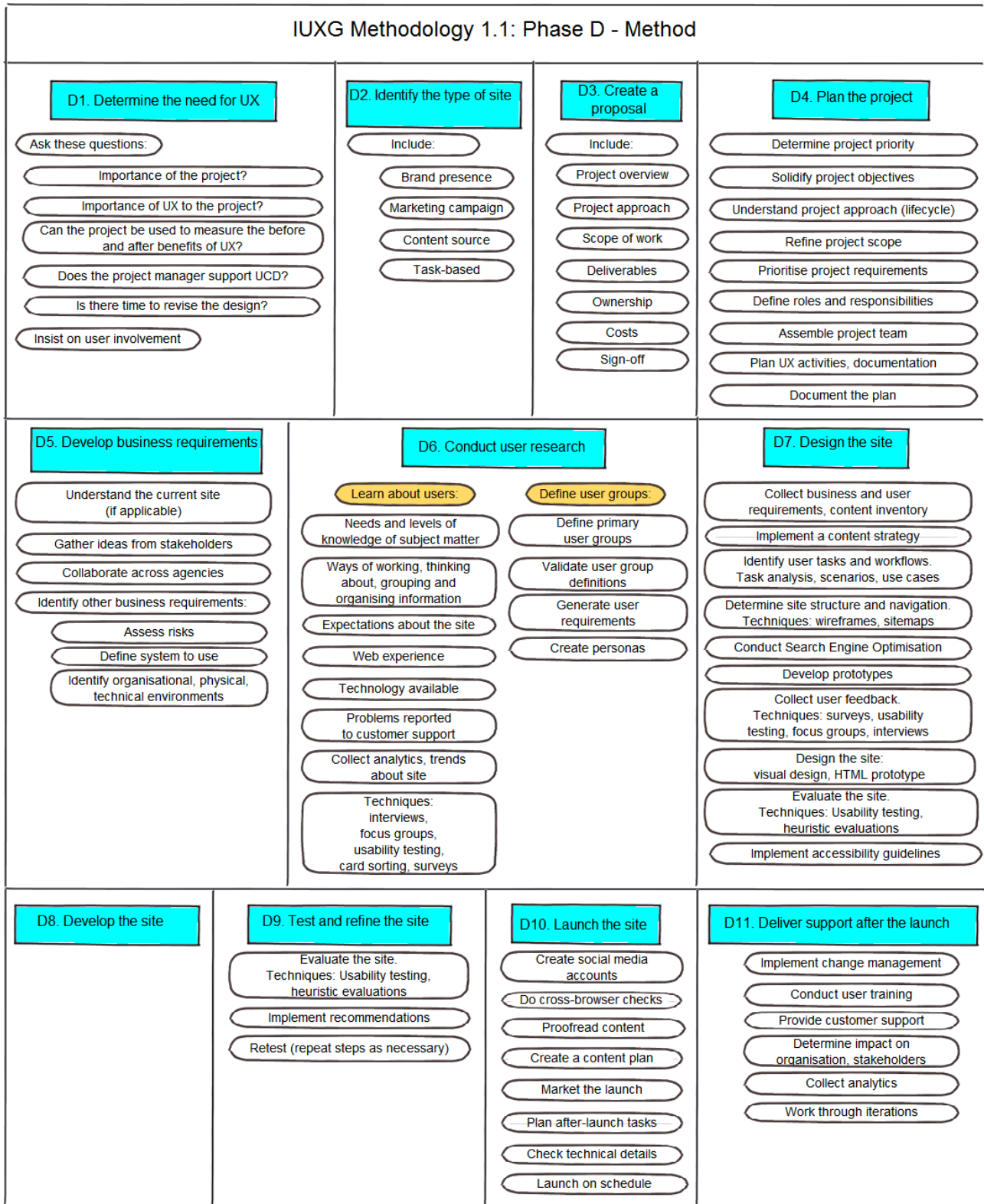


Figure 6.6: IUXG Methodology 1.1: Phase D - Method

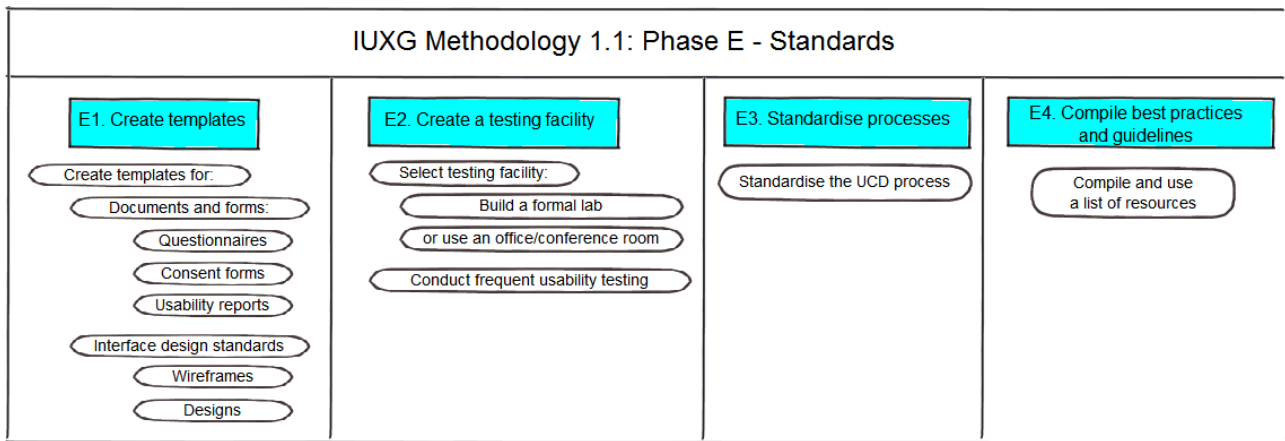


Figure 6.7: IUXG Methodology 1.1: Phase E - Standards

6.4.6 Phase F: Long-term

The following new steps and updates were made to Phase F, Long-term:

- New step: include a new step (F2) to *maintain UX awareness*:
 - Creating UX awareness should be an on-going practice;
- Update step F4: *adhere to laws and regulations*:
 - The WCG has provincial strategic objectives (such as PSO12, discussed in Sub-section 6.2.2) that drive the deliverables of the PG. PGs need to consider their provincial strategic objectives;
 - The e-Government act is listed in Phase A: Startup in the IUXG methodology 1.0. The reason it was listed in Phase A was to leverage the e-Government act in order to obtain buy-in. The WCG has an e-Government strategy that will be launched in 2013 (Western Cape Government, 2011a). It is therefore important to include the e-Government strategy in this step of Phase F of the proposed IUXG methodology;
 - Include laws and regulations identified in Table 6.1;
- Update step F5: *Stay up to date with latest trends and research*:
 - The WCG literature (Sub-section 6.2.2) and the follow-up survey results (Sub-section 6.3.4) showed that mobile (devices and applications) and social media need to be included as latest trends. Government can be expected to start using social networking techniques extensively in the future (Murray and Renaud, 2012). Mobile (devices and applications) and social media can also be used to bridge the digital divide (Macharia, 2011; Goldstuck, 2012);
 - The survey results listed several trends that have to be considered; they are illustrated in Figure 6.8. The items listed here may not be considered a trend

internationally anymore, but are all areas in which South African PG websites are lacking.

Figure 6.8 illustrates the updated Phase F, Long-term as discussed above.

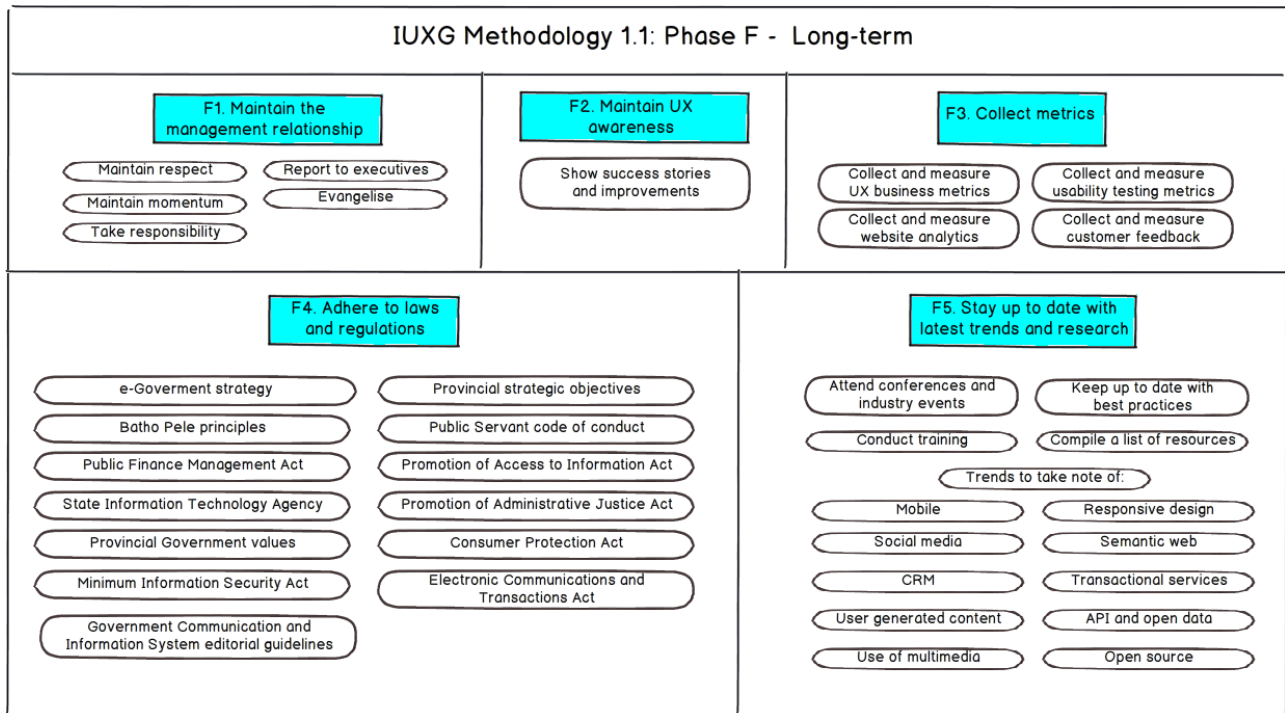


Figure 6.8: IUXG Methodology 1.1: Phase F - Long-term

6.4.7 The Updated IUXG Overall Methodology

Figure 6.9, uses the information from Sub-section 6.4.1 to Sub-section 6.4.6 to provide the updated IUXG methodology. This methodology is the second deliverable of this chapter and answers RQ4b (see Section 6.5: Summary). Figure 6.9 provides the main phases of the IUXG methodology, as well as the next high-level steps. Figure 6.3 to Figure 6.8 provided more detailed sub-steps for each of the main steps.

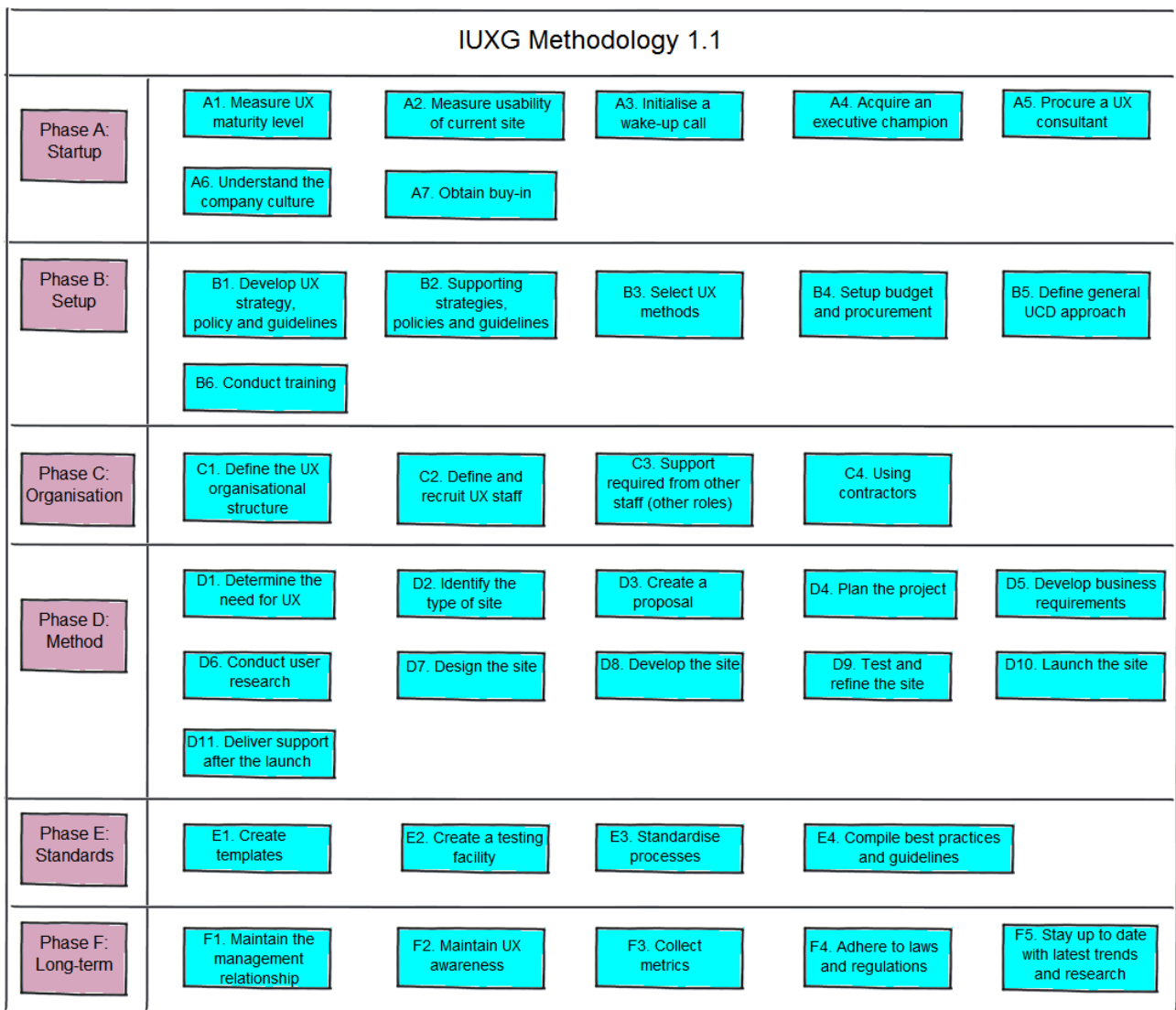


Figure 6.9: IUXG Methodology 1.1

6.5 Summary

Chapter 5 identified a number of resources for guidelines for e-Government website design. Chapter 5 also indicated that these guidelines are not being applied by South African PGs and that the UX maturity of South African PGs were low. Guidelines cannot be implemented if there is a lack of executive support, no adequately trained staff, a limited or no budget, and if UX methodologies and UCD processes are not being used.

The focus of this chapter was on the WCG, identified as the case study for this research (Sub-section 6.2.1). Many great strides have been made in implementing e-Government in Western Cape, but many challenges still lie ahead (Blessing and NtombovKlass, 2009). The UX maturity survey and follow-up survey results, demonstrate that UX is one of these challenges.

The first research objective addressed in this chapter was:

RO4a. Re-evaluate the maturity model level of UX in the WCG.

The first research question addressed in this chapter was:

RQ4a. What is the current maturity model level of UX in the WCG?

A follow-up survey was conducted with key WCG officials closely involved with the WCG website. The maturity model results showed that the WCG was at a low level of maturity between 2009 and 2010. There was no UX strategy, a lack of understanding of usability, UX and UCD and a lack of UX staff and leadership.

A usability facility did not exist and UX best practices or guidelines were not in place in 2010. UX did however start to emerge as a recognised, unique and valued skill; an executive champion started to emerge and budget was made available to employ a UX team leader. The first deliverable of this chapter, the results of the follow-up survey of the UX maturity level of the selected South African PG (WCG), answers RQ4a. The results were listed in Table 6.1.

The second research objective addressed in this chapter was:

RO4b. Propose an updated methodology to institutionalise UX in a South African PG (IUXG 1.1).

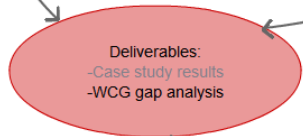
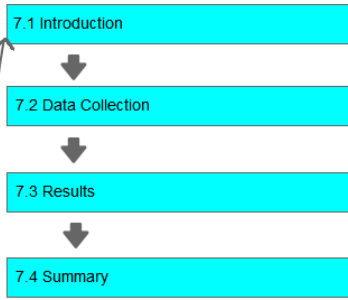
The second research question addressed in this chapter was:

RQ4b. What updated methodology should be proposed to institutionalise UX in a South African Provincial Government (IUXG 1.1)?

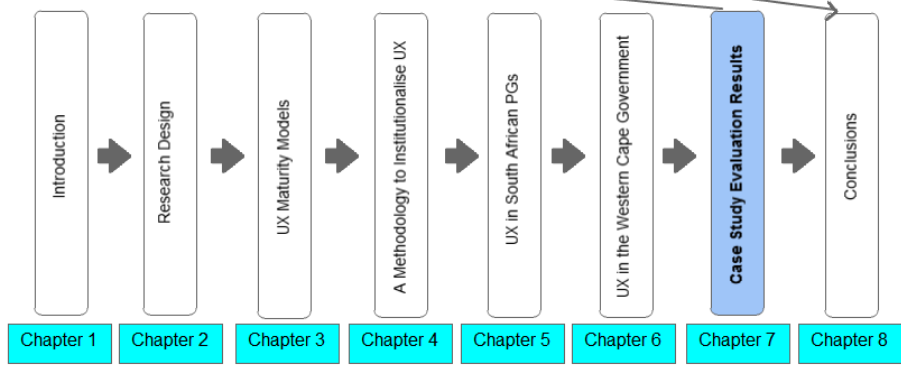
The results of the literature study (Section 6.2) and the follow-up survey (Section 6.3) were summarised in Table 6.2. The results were used to update the IUXG methodology proposed in Chapter 4. Each phase of the IUXG methodology was updated, except for the “Standards” phase. The second deliverable of this chapter, an updated proposed IUXG methodology to institutionalise UX in a South African PG (IUXG methodology 1.1) answers RQ4b.

The next chapter uses the WCG as a case study to test the updated IUXG methodology. The results of the case study are discussed and the IUXG methodology will be updated one final time, based on the results (Chapter 8).

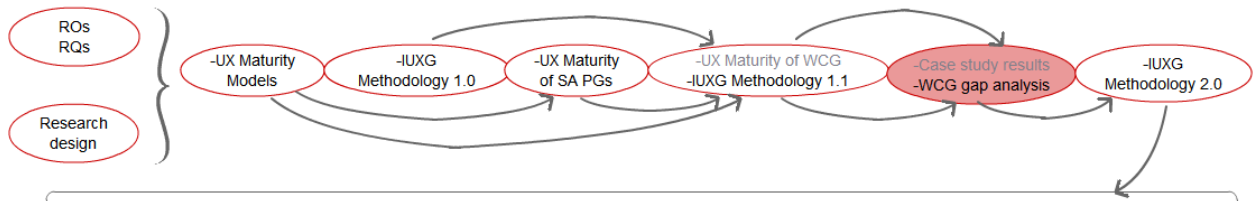
Chapter 7: Case Study Evaluation Results



- 7.3.1 Phase A: Startup
 - 7.3.1.1 A1: Measure UX Maturity Level
 - 7.3.1.2 A2: Measure Usability of Current Site
 - 7.3.1.3 A3: Initialise a Wake-up Call
 - 7.3.1.4 A4: Acquire an Executive Champion
 - 7.3.1.5 A5: Procure a UX Consultant
 - 7.3.1.6 A6: Understand the Company Culture
 - 7.3.1.7 A7: Obtain Buy-in
- 7.3.2 Phase B: Setup
 - 7.3.2.1 B1: Create UX Strategy, Policy and Guidelines
 - 7.3.2.2 B2: Supporting Strategies, Policies and Guidelines
 - 7.3.2.3 B3: Select UX Methods
 - 7.3.2.4 B4: Setup Budget and Procurement
 - 7.3.2.5 B5: Define General UCD Approach
 - 7.3.2.6 B6: Conduct Training
- 7.3.3 Phase C: Organisation
 - 7.3.3.1 C1: Define the UX Organisational Structure
 - 7.3.3.2 C2: Define and Recruit UX Staff
 - 7.3.3.3 C3: Support Required from Other Staff
 - 7.3.3.4 C4: Using Contractors
- 7.3.4 Phase D: Method
 - 7.3.4.1 D1: Determine the Need for UX
 - 7.3.4.2 D2: Identify the Type of Site
 - 7.3.4.3 D3: Create a Proposal
 - 7.3.4.4 D4: Plan the Project
 - 7.3.4.5 D5: Develop Business Requirements
 - 7.3.4.6 D6: Conduct User Research
 - 7.3.4.7 D7: Design the Site
 - 7.3.4.8 D8: Develop the Site
 - 7.3.4.9 D9: Test and Refine the Site
 - 7.3.4.10 D10: Launch the Site
 - 7.3.4.11 D11: Deliver Support After the Launch
- 7.3.5 Phase E: Standards
 - 7.3.5.1 E1: Create Templates
 - 7.3.5.2 E2: Create a Testing Facility
 - 7.3.5.3 E3: Standardise Processes
 - 7.3.5.4 E4: Compile Best Practices and Guidelines
- 7.3.6 Phase F: Long-term
 - 7.3.6.1 F1: Maintain the Management Relationship
 - 7.3.6.2 F2: Maintain UX Awareness
 - 7.3.6.3 F3: Collect Metrics
 - 7.3.6.4 F4: Adhere to Laws and Regulations
 - 7.3.6.5 F5: Stay Up to Date with Latest Trends and Research



Deliverables



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 7: Case Study Evaluation Results

7.1 Introduction

Chapter 4 proposed the Institutionalise User Experience in Government (IUXG) methodology (1.0). The IUXG methodology (1.1) was updated in Chapter 6 subsequent to the follow-up survey with Western Cape Government (WCG) officials. The objective of this chapter is to evaluate the updated IUXG methodology by means of a case study in the Western Cape (Provincial) Government, as identified in Chapter 6. The case study strategy was identified in the research design (Chapter 2) to collect and analyse data and to address the aims of the study. The results of the case study are used to update the IUXG methodology in the final chapter (Chapter 8).

The research objective addressed in this chapter is:

RO5. Evaluate the IUXG methodology (IUXG 1.1) using the Western Cape Government as a case study.

The research question addressed in this chapter is:

RQ5. Does the IUXG methodology (IUXG 1.1) institutionalise UX in the Western Cape Government?

The main deliverable of this chapter is the results of the case study. Additionally, a gap analysis of the WCG was delivered in Appendix I. Section 7.2 describes the data collection for the case study. The results of the case study are discussed in Section 7.3 and Section 7.4 summarises the findings of this chapter.

7.2 Data Collection

The WCG was selected as the case study for this research as the author is employed as the Usability Team Leader (UTL) in this Provincial Government (PG) in July 2010. One of the main responsibilities of the UTL was to institutionalise UX in the WCG, in the component, e-Government for Citizens (e-G4C). UX was institutionalised by implementing the IUXG methodology developed under the guidance of the Nelson Mandela Metropolitan University (NMMU) Computing Sciences promoter. The focus of the case study results was in the e-G4C component in the WCG.

The case study results revolved around using the UTL in the proposed IUXG methodology in the WCG. Figure 7.1 illustrates the case study data collection process. The data was collected by following the specific phases and steps of the IUXG in the e-G4C component. Official WCG procedures and professional protocols were followed to obtain the case study results of this study. The results were analysed, documented and filed as e-G4C official documents or minutes as they were collected. The official WCG documents will be referred to in the results. The results were grouped and refined for the purpose of this research study.

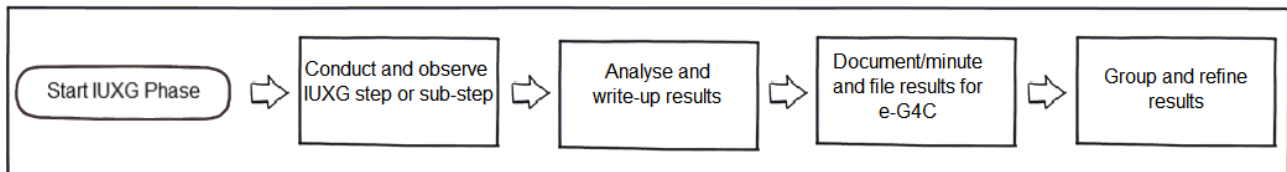


Figure 7.1: Case Study Data Collection

The period of data collection spanned from July 2010 to November 2012. Several WCG website projects were conducted in this period. The results and lessons learnt from these projects were formally documented and analysed. The WCG granted permission for the results of the research study to be published (Chapter 2, Section 2.3). The results are reported in the next section.

7.3 Results

The results of the IUXG methodology applied in the WCG (selected case study), are discussed in this section. The IUXG methodology has the following six main phases:

- Phase A: Startup: start the UX initiative;
- Phase B: Setup: establish the infrastructure;
- Phase C: Organisation: develop the UX team;
- Phase D: Method: the required steps for conducting a UX project;
- Phase E: Standards: minimise rework and enforce consistency;
- Phase F: Long-term: long-term considerations in order to keep UX institutionalised in government.

The results of each of the main phases of the IUXG methodology are discussed in this section. The IUXG methodology process is explained in terms of phases, steps and sub-steps. For example:

- **Phase A: Startup.** The main components (Phase A, Phase B, etc.) are referred to as phases;

- Phase A: Startup: **Measure UX maturity level.** These components are referred to as steps;
- Phase A: Startup: Measure UX maturity level: **Select a maturity model.** These components are referred to as sub-steps.

The results of Phase A: Startup, is discussed next.

7.3.1 Phase A: Startup

The focus of the startup phase is to highlight UX in order to start a UX initiative.

7.3.1.1 A1: Measure UX Maturity Level

UX maturity models allow the assessment of the degree of capability reached by a PG and its ability to perform human-centred design activities (Earthy, 1999). This step required the selection of UX maturity models. UX maturity models were identified and recommended in Chapter 3 (Sub-section 3.4.1). The recommended maturity models were those of:

- Schaffer (2004);
- Nielsen (2006);
- Feijo (2010).

Next, the level of UX maturity for the PG had to be measured. Table 7.1 lists the results of the UX maturity models as illustrated in Chapter 6 for the 2009 to 2010 period. The participants (indicated by “*n*” in Table 7.1) included key WCG officials (Chapter 6, Sub-section 6.3.2) working closely with the website. Further, the IUXG methodology recommended that a UX consultant conducted the evaluation with the appropriate PG team. Table 7.1 also lists the results as specified by the UX consultant (in this case the author of this research). The results of the UX consultant were calculated, based on the follow-up survey results from the WCG officials.

The lowest, highest and UTL maturity model ratings by participants were as follows (Table 7.1):

- Nielsen: Lowest rating: **stage 1**; Highest rating: **stage 4**; UTL rating: **stage 4**;
- Schaffer: Lowest rating: **level 0**; Highest rating: **level 2**; UTL rating: **level 1**;
- Feijo: Lowest rating: **level 1**; Highest rating: **level 2**; UTL rating: **level 2**.

The results indicated low maturity model ratings for the WCG for the 2009 to 2010 period. The UX maturity level for the WCG will be measured again in the following chapter to determine if the UX

maturity level improved since the implementation of the IUXG methodology. The next sub-section measures the usability of the current site.

Table 7.1: User Experience Maturity Models Results for the Western Cape Government		
Model	2009-2010 Results	
	WCG Officials	UX Consultant
Nielsen (Stage 1 - 8)	Stage 1: n=1: <ul style="list-style-type: none"> • Hostility towards usability. Stage 2: n=1: <ul style="list-style-type: none"> • Developer-centred usability. Stage 4: n=2: <ul style="list-style-type: none"> • Dedicated usability budget. 	Stage 4: Dedicated usability budget: <ul style="list-style-type: none"> • The organisation starts to invest more in usability: a usability team leader position was created; • A dedicated budget for usability exists: a limited budget exists, including a budget to fund the usability team leader post; • The main usability method is user testing late in the development process: this description of stage 4 was not met. The stage 3 description “<i>all usability activities are ad hoc</i>” was more applicable for this stage.
Schaffer (Level 0 - 5)	Level 0: n=2: <ul style="list-style-type: none"> • Clueless. Level 1: n=1: <ul style="list-style-type: none"> • Piecemeal usability. Level 2: n=1: <ul style="list-style-type: none"> • Managed usability. 	Level 1: Piecemeal usability: <ul style="list-style-type: none"> • Individuals are trying to apply usability techniques to some projects but there is no commitment by the organisation. Usability is not managed as part of an overall strategy; • The UX effort is not integrated or accepted in the design process; • Good work can happen at this level, but usability is immature and not correctly institutionalised.
Feijo (Level 1 - 6)	Level 1: n=1: <ul style="list-style-type: none"> • Unrecognised. Level 2: n=3: <ul style="list-style-type: none"> • Interested. 	Level 2: Interested: <ul style="list-style-type: none"> • UX is important but receives limited funding.

7.3.1.2 A2: Measure Usability of Current Site

The goal of this step was to “*evaluate the site*” using usability testing methods, such as usability testing with users, interviews and focus groups. The IUXG methodology recommended that a UX consultant should conduct the usability evaluation of the PG e-Government website. Focus groups were conducted by the UTL to obtain an early measurement of usability of the WCG website. A focus group is defined as a moderated discussion amongst a group of people who discuss a topic

under the direction of a facilitator whose role is to promote interaction and keep the discussion on the topic of interest (Stewart, Shamdasani and Rook, 2007).

The goals of the focus groups were as follows (Pretorius and Saunders, 2011; Pretorius and Calitz, 2011a):

1. Obtain insights into the thoughts of typical users and stakeholders of the WCG website for improvements to the current site;
2. Input into the development of a new/future site;
3. Learn about the needs and requirements of typical users and stakeholders;
4. Obtain a sense of the usability of the website through the eyes of the users;
5. Start creating UX awareness in the organisation;
6. Understand the WCG e-Government website. The UTL started only a short time before the focus groups commenced. The focus group guided the UTL to understand the WCG website through the eyes of the users.

The following groups participated in the focus groups:

- E-G4C internal staff (the staff managing the portal);
- WCG Call Centre staff;
- WCG Contact Centre staff;
- Red Door Advice Centre's staff (provide administrative support to small, medium and micro enterprises (SMMEs));
- Red Door Advice Centre's small business clients;
- Head of Communications of the WCG Departments and citizens of the Western Cape.

This was the first time focus groups were used in e-G4C (Pretorius and Saunders, 2011; Pretorius and Calitz, 2011a). The complete set of results can be viewed in the paper by Pretorius and Calitz (2011a) entitled: *The Use of Focus Groups to Improve an e-Government Website* (Appendix J).

Important extracts from the results of the focus group included:

- The most important issue highlighted was that the content of the website was out-dated. Content strategies and guidelines were developed (Sub-section 7.3.2.2) to assist in achieving improved and regularly updated content;

- Users described the homepage as “*old, static and boring*”. A carousel was implemented on the homepage where several news stories are shown. There is movement on the website and new content/stories are provided regularly;
- Public participation documents were not prominent enough. The content team now includes such items as top stories in the carousel;
- Navigation was a major issue and had to be addressed. The current version now has drop-down menus, allowing the user to see exactly what options are available as a part of each main menu item. Several words used on the WCG website were renamed to improve navigation and the comprehension of words;
- Participants could not identify the meaning of the icons on the homepage (Chapter 1, Figure 1.1). The icons were replaced with photos with a clear meaning (Figure 7.2);
- The Western Cape aspect of the portal is not clearly emphasised. Participants were commenting on the name of the website (Cape gateway at the time) as not being effective. Participants stated that users were confusing the website with the Cape Gateway housing project and Cape Gate mall in the Western Cape, South Africa.

The focus groups proved to be a success as results led to recommendations and, in turn, to enhancements of the WCG e-Government website (Pretorius and Garlick, 2011). Figure 7.2 illustrates the improved website, implemented in 2011, after changes were made as a result of the focus groups. The focus group results were also used as input in the follow-up improvement of the website illustrated in Chapter 8 (Figure 8.8).

Organising focus groups within an organisation can be useful to obtain buy-in to a project from within that organisation (WebCredible, 2006). Buy-in was achieved from these focus groups as internal stakeholders, specifically, appreciated being engaged in the exercise of improving the WCG website. The focus group results were used to initialise a wake-up call (Sub-section 7.3.1.3) and they also assisted in obtaining buy-in for UX (Sub-section 7.3.1.7). Initialising a wake-up call is discussed next.

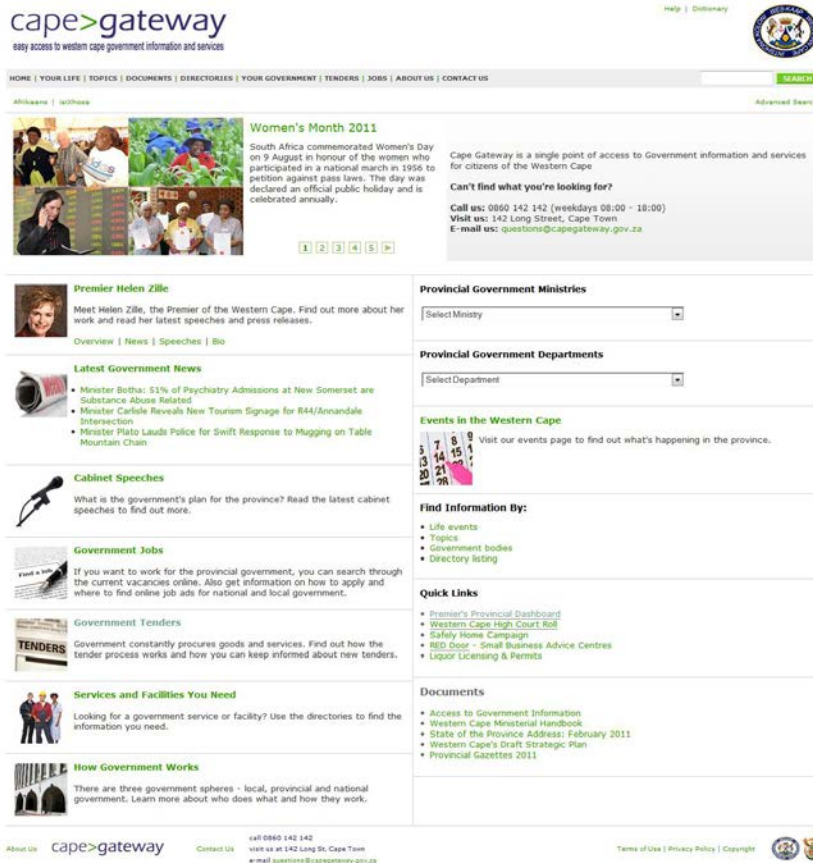


Figure 7.2: WCG Website between 21 January 2011 and 20 October 2011

7.3.1.3 A3: Initialise a Wake-up Call

Organisational changes toward usability can be attained by critical incidents - “wake-up calls” (Schaffer, 2004). The UX maturity of the WCG (Sub-section 7.3.1.1), as well as the usability of the WCG e-Government website (Sub-section 7.3.1.2) were measured. These results contributed to the wake-up call for the WCG. This step required finding and documenting more wake-up calls. The following is a list of additional wake-up calls that were found and documented in the WCG:

- Website analytics in 2009 showed that visits to the website were declining (follow-up survey result, Chapter 6). There were few citizens and staff using the website. The number of unique visitors (number of unduplicated visitors to the website over the course of a specified time period) increased from 1 829 930 in 2010/2011 to 3 019 828 in 2011/2012 due to UX, content and technical improvements (Table 7.5);
- During 2011, a WCG website could not be loaded in the Chrome browser (Google browser) during a parliamentary seating in Cape Town (Cape Argus, 2011). This prompted the inclusion of cross-browser testing in the revised Systems Development Lifecycle (SDLC) (Pretorius, 2012c);

- The UX of the internal performance evaluation system (not developed by e-G4C) was a companywide wake-up call in 2011, showing that UX was required. After an increasing number of complaints to management and the helpdesk, the development of a new version was commissioned. There was a request for UX to be involved; however, the UX team was involved only at the end of the project. The user-centred design (UCD) process recommends that UX activities are conducted throughout the system lifecycle; not only at the end (Chapter 3, Section 3.3). Most of the documented recommendations made by the UX team (Pretorius, 2012b) were not implemented, as limited time remained to meet an internal deadline. Stakeholder involvement was limited and development was done from the developer's perspective. The new version of the system, launched in 2012, again received a number of complaints. Senior management realised that UX was required not only for the citizen facing website (e-Government website), but for other websites and systems as well. This prompted the review of the SDLC (Pretorius, 2012c).

Finally, the third sub-step was to “*present results of UX maturity level, usability of site and other wake-up calls to management*”. The following key presentations were made to management:

- The focus group results (Sub-section 7.3.1.1) were presented to e-G4C management. The results were compiled into a formal WCG document (Pretorius and Saunders, 2011) and signed off by management. The document also included guidelines on how to conduct focus groups (Pretorius and Saunders, 2011; Pretorius and Calitz, 2011a). The results of the focus groups led to management's approving recommendations implemented on the WCG website (Pretorius and Garlick, 2011). The improvements on the website assisted in achieving UX buy-in throughout the e-G4C team;
- The results of the maturity model level (Sub-section 7.3.1.2) from the first survey with South African PGs (Chapter 5) were documented in a research paper for an international e-Government conference (Pretorius and Calitz, 2012) (Appendix L). The research paper was presented to the overall WCG senior IT management group (Centre for e-Innovation). The presentation was well received and prompted management to approve an investigation into the overall WCG SDLC to include UX methods (Pretorius, 2012a; Pretorius, 2012c);
- Sub-section 7.3.1.7, obtain buy-in, lists several presentations that were delivered to advocate the topic of UX.

7.3.1.4 A4: Acquire an Executive Champion

The goal of this step is to find an executive champion who can gain support and resources. The Director of e-G4C was identified as the executive champion. The executive champion assisted the cause of UX by (WebCredible, 2012):

- *Raising awareness of a UCD approach with the senior management team:* An exercise was conducted to revise the SDLC to incorporate UCD within the wider organisation (Sub-section 7.3.5.3) (Pretorius, 2012c). The executive champion and UTL raised heightened awareness of the senior management and a decision was made to revise the SDLC;
- *Requesting budget to resource usability projects with skilled professionals:* The executive champion made budget available to employ/contract more UX staff (Sub-section 7.3.3.2);
- *Promoting usability success stories across the company:* The executive champion reported on UX at senior management meetings. He also called upon the UTL to present success stories (Sub-section 7.3.1.7) at senior management meetings;
- *Supporting organisation change to help institutionalise usability:* The executive champion helped to support change in the organisation by: supporting revisions to the SDLC (Pretorius, 2012c); supporting UX methods; making budget available; supporting the work of the UX team and by promoting their work.

Additionally, the Director of e-G4C allocated a budget to employ a UTL. The procurement of a UX consultant (UTL) is discussed next.

7.3.1.5 A5: Procure a UX Consultant

Assistance is required to start the UX institutionalisation process. A qualified UX consultant is invaluable in helping an organisation to transition to an efficient and thorough UCD process (Schaffer, 2004). A UX consultant guides strategy, sets up infrastructure, helps to develop staff and smoothly transitions to a role that supports the internal group (Schaffer, 2004). Sub-section 7.3.1.4 noted that the executive champion made the required budget available for the UTL to be appointed. The UTL was the appointed UX consultant.

The IUXG recommends that the UX consultant must “*provide infrastructure*” and “*jump-start the institutionalisation process*”. The steps identified in the IUXG methodology, such as developing UX strategy, policy and guidelines; creating templates and standardising the UCD process help the UX consultant to achieve these goals.

7.3.1.6 A6: Understand the Company Culture

An organisation's culture may not be the same across all business units and departments; however, key characteristics can usually be identified that will affect a specific project (Unger and Chandler, 2009). The IUXG methodology recommended the investigation of the PG's history, company purpose, hierarchy and logistics. The impact of these areas on e-G4C in the WCG was as follows:

- *History*: The goal is to understand how a team reached its current state in order to be aware of potential challenges that might be faced. This sub-step was addressed by means of a follow-up survey (Chapter 6). The follow-up survey listed several challenges faced by WCG officials before the UX institutionalisation exercise started. These challenges were addressed by updating the IUXG methodology in Chapter 6. The challenges and steps included:
 - Lack of understanding of usability: This challenge was addressed through steps *A7: Obtain buy-in* (Sub-section 7.3.1.7) and *F2: Maintain UX awareness* (Sub-section 7.3.6.2);
 - No or limited awareness that usability needs to be part of the development process: This challenge was addressed through steps *A7: Obtain buy-in* (Sub-section 7.3.1.7), *B5: Define general UCD approach* (Sub-section 7.3.2.5), *E3: Standardise processes* (Sub-section 7.3.5.3) and *F2: Maintain UX awareness* (Sub-section 7.3.6.2);
 - No or limited budget: This challenge was addressed by steps *A4: Acquire an executive champion* (Sub-section 7.3.1.4), *A7: Obtain buy-in* (Sub-section 7.3.1.7) and *B4: Setup budget and procurement* (Sub-section 7.3.2.4);
 - No usability team leader was appointed: This challenge was addressed through step *A5: Procure a UX Consultant* (Sub-section 7.3.1.5);
 - No UX posts exist: This challenge was addressed through step *C2: Define and recruit UX staff* (Sub-section 7.3.3.2);
 - Need to be more citizen-centric and there was no direct feedback from users: This challenge was addressed through steps *B3: Select UX methods* (Sub-section 7.3.2.3), *B5: Define general UCD approach* (Sub-section 7.3.2.5) and *E3: Standardise processes* (Sub-section 7.3.5.3);
 - Procurement issues: This challenge was addressed through steps *A4: Acquire an executive champion* (Sub-section 7.3.1.4), *A7: Obtain buy-in* (Sub-section 7.3.1.7) and *B4: Setup budget and procurement* (Sub-section 7.3.2.4);

- Licensing of the content management system (CMS): This was a procurement issue that was addressed through step *B4: Setup budget and procurement* (Sub-section 7.3.2.4);
- Legacy systems were a barrier to improvements to usability: This issue was addressed through step *D8: Develop the site* (Sub-section 7.3.4.8). Development is not the focus of this study; however, it is important to consider and select an appropriate platform for development;
- The UX work that was outsourced had problems with project delivery issues and implementation delays: This issue was addressed through step *C4: Using contractors* (Sub-section 7.3.3.4);
- *Company purpose*: The company in this case study is a South African PG (WCG). The WCG was explained in detail in Chapter 6 (Section 6.2). The focus of this research study is on the WCG e-Government website. The WCG website is a single point of access to government information and services for citizens of the Western Cape (Western Cape Government, 2012a). The website is managed by e-G4C. The core function of e-G4C is to provide support for the WCG e-Government website, Intranet, Cape Access and the contact centre (discussed in Sub-section 6.2.3);
- *Hierarchy*: Power distance will have an impact in the government sphere. Power distance is the extent to which members of a society (in this case, staff in government) understand and accept the distance between people of different levels of power (Unger and Chandler, 2009). Understanding of reporting relationships is important before meetings such as stakeholder interviews can be scheduled;
 - E-G4C forms a part of the Centre for e-Innovation (Ce-I) in the WCG, which has the following management order:
 - Deputy Director Generals (DDG): head of Ce-I;
 - Chief Directors: heads of different Ce-I components;
 - Directors : heads of different directorates in each Ce-I component;
 - Deputy Directors: heads of different sub-directorates in each Directorate;
 - Assistant Directors: assist deputy directors in each sub-directorate;
 - The hierarchy in PG is that an official communicates, directly, to only one management level above his/her level. If communication is required with a manager above that level, the manager of the official (managers between levels) has to be informed and that manager often has to facilitate the conversation. Ce-I has frequent

- meetings where various levels of management are represented to facilitate effective communication;
- New Web projects typically originate from representatives in the different WCG departments. Requests from senior management can also initiate projects. The Programme manager (in e-G4C) for the WCG website is typically the first line of communications with stakeholders and clients of new projects;
- The current political party leading the WCG can also have an impact on the hierarchy and projects conducted. The WCG has seen a change of political power in the past. An example of the impact of such a power change is the PG branding (Western Cape Government, 2011b). The branding of the WCG changed with the new political power and therefore all WCG websites and systems have to be updated to accommodate the new brand;
- *Logistics*: It is important to understand current work methods in order to introduce change in a thoughtful way (Unger and Chandler, 2009). The methods and tools of communication and the paper culture of the organisation need to be understood (Unger and Chandler, 2009);
 - E-mail communications (Microsoft Outlook) and meetings are the most commonly used communication method in the WCG. Any decision in the working environment has to be documented and approved;
 - Electronic media is generally used in meetings; therefore, projectors and an Internet connection should be arranged.

This section investigated the history, company purpose, hierarchy and logistics of the WCG. Obtaining buy-in for UX is discussed next.

7.3.1.7 A7: Obtain Buy-in

Organisation and staff buy-in is required to truly institutionalise UX into an organisation and to ensure that it is not an afterthought. The first sub-step of this step of the IUXG methodology was to “*change the mindset of management*” from considering usability as an extra step, to understanding the return on investment (ROI). The WCG achieved this by “*showing success stories and improvements*” by means of accounts of success and by presentations.

Several presentations were delivered to evangelise the concepts of usability and UX in e-G4C and the WCG. Key presentations included the following (the audience is listed in brackets):

- *E-G4C* (Director, Deputy Directors and non-management members of staff):
 - The concept of UX and usability testing was presented on the arrival of the UTL (Pretorius, 2010). Usability testing videos of previous studies that the author conducted were demonstrated. This presentation helped to create UX awareness in the team;
 - E-G4C hosts monthly “*Friday learning sessions*” where various Web trends and technologies are presented to the entire e-G4C team. Usability results of WCG website studies as well as UX activities and information are presented. The UTL used these session to provide on-going UX awareness to the internal team;
 - New and updated wireframes and designs of the WCG website were continuously presented to the internal team for feedback. These sessions assisted the entire team in comprehending the benefits that UX offers;
- *Senior Ce-I management* (Deputy-Director General, Chief Directors and Directors):
 - The concept of UX and usability testing were presented to senior Ce-I management (Pretorius, 2011a). Usability testing videos of previous studies that the author conducted were demonstrated. This presentation helped to create UX awareness in management. Further, support was given to include UX activities in e-G4C;
 - The maturity model level results (Sub-section 7.3.1.2) from the first survey with South African PGs (Chapter 5) were documented in a research paper for an international e-Government conference (Pretorius and Calitz, 2012). Management realised that UX activities had to be included in the wider Ce-I. This prompted an investigation into the WCG SDLC (Pretorius, 2012a; Pretorius, 2012c);
 - Several presentations were conducted regarding the inclusion of UCD and UX activities in the SDLC. A revised SDLC draft (Appendix F; Pretorius, 2012c), including UX activities, is currently being tested in a proof of concept project. Sub-section 7.3.2.5 discusses the SDLC;
 - Usability results of a WCG online bursary website were presented (Pretorius, 2012d). The results were significant as several internal systems used the same look and feel. Support was given for the creation of wireframe and design templates for WCG websites and systems with the approval of a business analyst staff position (Sub-section 7.3.3.2);

- *Developers in Ce-I*: The concept of UX and usability testing (Pretorius, 2010), UCD in the SDLC (Pretorius, 2012e) and the usability results of the online bursary website (Pretorius, 2012d), as described above, were presented in order to create UX awareness and buy-in;
- *Departments*: The concepts of UX and usability testing (Pretorius, 2010) and specific project usability results (Pretorius, 2012d) were presented in order to create UX awareness and buy-in;
- *National Department of Government Communication and Information Systems (GCIS)*: The concepts of UX and usability testing were presented in order to create UX awareness nationally (Levy, Pretorius and Bevan, 2012);
- *Conferences and seminars*:
 - Presenting UX topics at local and international conferences and seminars helped senior management to take note of the impact of UX. The following includes key conferences and seminars at which the UTL presented:
 - European Conference on e-Government: the results of the UX maturity of South African PGs were presented (Pretorius and Calitz, 2012);
 - International Business Conference: usability methodologies and eye tracking were presented (Pretorius and Calitz, 2010; Pretorius and Calitz, 2011b);
 - Symposium of Web Society: the use of focus groups to improve the e-Government website was presented (Pretorius and Calitz, 2011a);
 - Unisa eye tracking seminar: the use of eye tracking in usability was presented (Pretorius, 2012f);
 - E-Skill Summit: this was a conference organised by the WCG. The importance of usability testing, by using users with different e-skills was presented (Pretorius and Van Biljon, 2010);
 - University presentation: A UX presentation was done at the Nelson Mandela Metropolitan University at an industry collaboration event (Pretorius, 2011b).

The presentations listed above assisted in evangelising the concepts of usability and UX in e-G4C and the WCG. Additional important success stories and improvements that were showcased (not discussed in the presentation section above) included:

- New WCG website homepage (Pretorius and Garlick, 2011): This activity helped to create UX buy-in from senior managers;

- Second revision of the WCG homepage and the application of the new WCG branding (Pretorius and Essa, 2011);
- Wireframes and designs were presented to stakeholders, including:
 - WCG website (Saunders, 2011);
 - Safely Home campaign (westerncape.gov.za/safelyhome) (Pretorius, 2011c);
 - New tenders website (still to be implemented) (Pretorius, 2012g);
- “*Fix-it Fridays*”: Sessions with departments were held to improve their presence on the WCG website. These sessions were called “*Fix-it Fridays*” as they occurred on selected Fridays and the goal was to identify areas that could easily be improved. This idea was based on the Howto.gov (2012a) First Fridays Product Testing Programme where these sessions helped to create UX awareness and buy-in from several departments.

The final sub-step was to “*focus on the e-Government act*”. This step was not applicable to the WCG during the course of this research, as there was no official strategy in place. The WCG made a draft e-Government strategy available for public comment in September 2012 (Western Cape Government, 2012d) and will be signed off in 2013.

7.3.2 Phase B: Setup

The focus of the setup phase is to establish the infrastructure required to conduct efficient and professional UX work. The results of implementing the steps in the setup phase in the WCG are discussed next.

7.3.2.1 B1: Create UX Strategy, Policy and Guidelines

The initial IUXG methodology (1.0) only recommended a UX strategy. After consultation with WCG officials, this step was updated to include policy and guidelines (Chapter 6). E-G4C uses the following descriptions for policy and strategy: *a policy states what we do; a strategy states how we do it.*

During 2010 and 2011, informal policy, strategy and guidelines were used. An experimental approach was used to test the policy, strategy and guidelines. These documents were not officially approved in the 2010 to 2011 period. The policy (what we do) was based on the first implementation of an updated SDLC for e-G4C (Sub-section 7.3.2.5). UX activities included focus groups, wireframing, design and heuristic evaluations and were implemented on various WCG

website projects (Sub-section 7.3.4). The strategy (how we do it) was formalised as UX activities were conducted. The focus groups (Sub-section 7.3.1.2), for example, were one of the first UX activities conducted. After the completion of the focus groups, strategy and guidelines for focus groups were formally documented and signed off (Pretorius and Saunders, 2011).

The e-G4C team used UX guidelines based on best international practice such as government website guidelines (Chapter 5, Section 5.4) from countries such as the United States, UK, Canada and Australia (Mifsud, 2011). Additionally, guidelines from Jakob Nielsen, a renowned expert in the UX field were implemented (Nielsen and Loranger, 2006). The guidelines used are available on the Web, in books and in academic research articles; however, the use of these guidelines proved to be problematic in the WCG environment as certain departments would not accept UX recommendations (based on best practice) for their department websites. Generally, these departments were of the opinion that there is no official policy or guidelines that obligate them to accept the UX recommendations, despite the guidelines being international best practice. Further, development teams outside of e-G4C were not aware of UX guidelines. These problems led to the need to document official UX guidelines, to be approved by the Director-General.

During 2012, a first draft document of official WCG UX policy, strategy and guidelines was released (Pretorius, 2012h). The goal of this document was to provide a list of usability, design and UX guidelines to be applied to WCG websites and systems. UX guidelines were provided in terms of: fundamental UX principles; overall UX guidelines; branding; design, images and graphics; navigation and links; uniform recourse locators (URLs) and window titles; usability guidelines for content writing; accessibility; homepage guidelines; about and contact guidelines; downtime of websites or systems; login and registration on websites and systems; search functionality; forms; forbidden items and validator tools.

The document also provided policy for UX in the WCG (Pretorius, 2012h):

- A new WCG website or system is generally developed internally or purchased from an organisation;
 - The policy for internally developed websites and systems was:
 - UX activities, as per the e-G4C SDLC (wireframes, use of templates, Web design, heuristic evaluations, usability testing) need to be conducted;
 - The UX guidelines need to be adhered to;

- The policy for purchased websites and systems was:
 - The website or system needs to be customised to adhere to the UX guidelines;
- Projects exist in the wider WCG where the UX team is not directly involved; where external development teams or private contractors are generally commissioned for development. When this is the case, the UTL needs to review wireframes and designs during the design process and the UTL has to approve final wireframes and designs (to confirm that UX guidelines are satisfied) before development can start;
- A website or systems can only be accepted for launch if UX policy and guidelines have been satisfied;
- Usability testing recommendations or heuristic evaluations recommendations must be implemented.

Policy and strategy for the UX team in e-G4C were provided additionally (Pretorius, 2012h). The services that the UX team in e-G4C offer were described and descriptions were also given how to conduct these services. The services included: user research (focus groups, surveys), designing a website or system (wireframes and templates, Web design) and usability testing of a website or system (heuristic evaluations, usability laboratory testing). Sub-section 7.3.2.3, Select UX Methods, will describe these services in greater detail. The next section lists strategies, policies and guidelines that will support the institutionalisation of UX.

7.3.2.2 B2: Supporting Strategies, Policies and Guidelines

Chapter 6 identified that the UX team has to be supported by strategies, policies and guidelines from other components (such as content and technology) of the website development process. The supporting policies, strategies and guidelines that were identified were:

- *Content*: A 2004 version of content policy and guidelines was in place up to 2012. A new WCG content policy (Bevan, 2012a) and guidelines (Bevan, 2012b) were released in 2012;
- *Branding*: The WCG Corporate Communications team, responsible for the WCG brand, released updated branding policy and guidelines (named the Corporate Identity Guidelines) in 2011 (Western Cape Government, 2011b);
- *Training*: No specific training policy, strategy or guidelines were in place at the time of publishing this research;

- *Social media*: The development of policy, strategy and implementation guidelines for social media started and is expected to be completed by the end of 2012;
- *E-Government*: A first draft of the e-Government strategy was released for public comment in 2012 (Western Cape Government, 2012d) and the approved version is expected to be released in 2013;
- *Website*: A new WCG website policy and strategy document was planned and budgeted for in 2012; however, it is only expected to be released in 2013;
- *Mobile*: A mobile policy and strategy document was planned and budgeted for in 2012; however, it is only expected to be released in 2013;
- *Development*: A new Technology Manager, joining e-G4C in 2012, started with an official project to formalise e-G4C development policies and strategies.

The list above illustrates that progress of implementing supporting policies has been made, as the majority of these policies did not exist before 2010. Many of the policies are still in draft form and are expected to be completed in 2013. The next sub-section discusses the UX methods selected for the WCG.

7.3.2.3 B3: Select UX Methods

The goal of this step was to select UX methods to improve the WCG e-Government website. Figure 7.3 illustrates the UX methods that were selected for the WCG. These methods are the services that the e-G4C UX team offer to e-G4C and the wider WCG. Appendix D defines and describes the services offered by the e-G4C UX team. The services are grouped into three categories:

- *User research* (user analysis and input): focus groups and surveys;
- *Design* (the process of designing a website or system): wireframes, Web design and templates;
- *Usability testing* (testing if the website or system meets user and organisational needs, as well as adherence to UX guidelines): heuristic evaluations and usability laboratory testing.

The next section discusses the setup of budget and procurement in order to institutionalise UX.

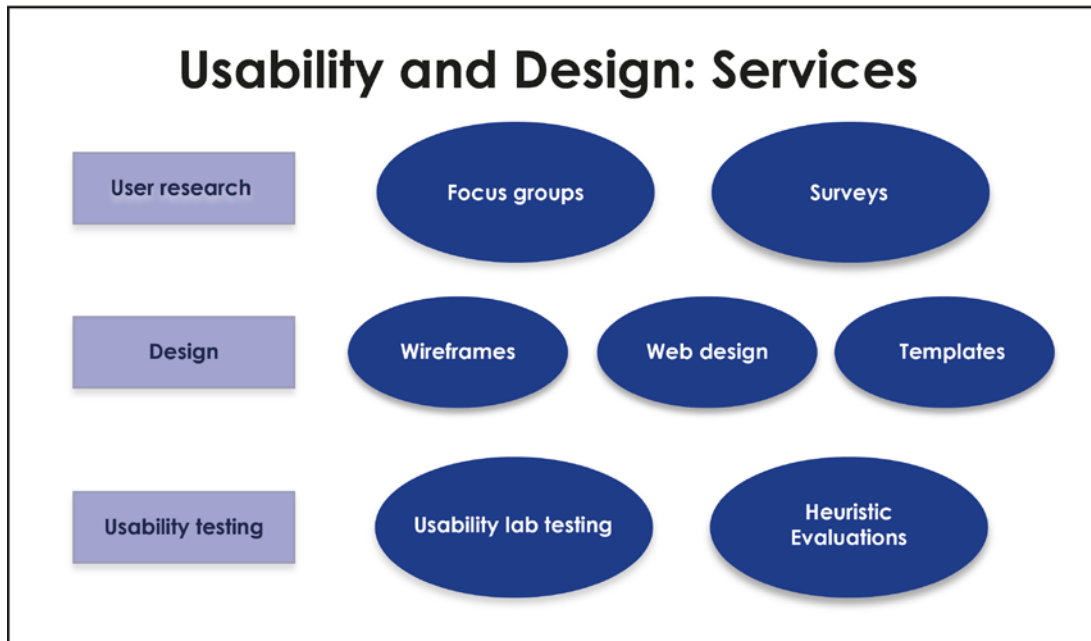


Figure 7.3: Selected UX Methods (Services) for the WCG

7.3.2.4 B4: Setup Budget and Procurement

The first goal of this step was to set up a formalised budget for UX. A dedicated UX budget is required to recruit UX staff. E-G4C has an available budget for UX employees (staff forming part of the e-G4C establishment). Further, a dedicated UX budget is required to conduct UX activities; to recruit UX contractors; to build a testing facility; to procure UX software and hardware; to recruit usability testing participants; to provide incentives to usability testing participants and to provide training. The budget of the WCG e-Government website programme is used to fund the activities described above.

Next, the procurement process had to be understood. Chapter 6 indicated that procurement is a problem in government. The following procurement challenges were faced:

- The procurement of developer staff and contractors was the biggest procurement issue faced by e-G4C. At the start of this research study, e-G4C had only one Web developer. *“It took us a more than a full year to employ one more website developer”* (Levy, 2012c: 1). A number of challenges had to be faced in completing the procurement process, including, what was the correct process to follow. Procurement is still a challenge at e-G4C, as pitfalls still exist in recruiting website developers;
- Conducting procurement towards the end of the financial year was a challenge. The finance component only allows emergency procurement during this time and has this to be approved

by senior management. A lesson learnt to avoid this issue is to plan that procurement must be completed before the end of the financial year. This issue also affects usability testing, where incentives may be provided to participants. Usability testing should be avoided in the last month of the financial year and in the first month of the new financial year (March and April in the WCG) as funds may not be available;

- The procurement process is generally long in duration. A hardware item that was required for the usability laboratory took a year to procure. The lesson is to plan procurement as far ahead as possible before the item is required.

The general lesson for procurement is to consult with supply chain management experts in the PG and to understand the delegations (rules) around procurement. The next sub-sections define the general UCD approach.

7.3.2.5 B5: Define General UCD Approach

The goal of this step was to specify how the UX methods (Sub-section 7.3.2.3) are included in the system's lifecycle process. An approach was taken to include wireframing, Web design and heuristic evaluations at first and gradually to incorporate the other identified UX methods (focus groups, surveys, usability testing and templates). The SDLC was developed in consultation with the e-G4C stakeholders: Internet Programme Manager, Project Manager and three works streams were used; UX (named usability and design internally), content and technology (Parks, 2011). Appendix E demonstrates the steps that were agreed upon for the first iteration of the e-G4C SDLC. This iteration was used on a WCG tenders website project. The SDLC illustrated in Appendix E is grouped into six main activities, namely (Parks, 2011):

- Requirements: Approve stakeholder and user requirements;
- UX: Approve wireframes and design;
- Content: Approve content for the website;
- Technology: Approve the implementation of the website;
- Change management: Conduct the required training;
- Deliver the website: Sign off and launch the website.

The initial SDLC (Appendix E) was updated as lessons were learnt throughout project iterations. Sub-section 7.3.5.3, standardise processes, will elaborate on the improved SDLC, incorporating all the UX activities (Sub-section 7.3.2.3). The next section discusses training requirements.

7.3.2.6 B6: Conduct Training

The IUXG methodology required two types of training to be conducted (Schaffer, 2004):

- Knowledge training: educate staff members about the importance of the process of usability;
- Skills training: Develop staff members (including UX certifications) who will be conducting interface design work.

Knowledge training was conducted by presenting UX topics to make staff aware of UX and the importance thereof. Sub-section 7.3.1.7 provided a list of UX presentations that were delivered to several WCG stakeholders. UX staff members in e-G4C received opportunities for skills training. There are very few UX short courses offered in South Africa. The UX employees of the WCG found the Human Factors International (HFI) short courses to be valuable as they offer international UX certification. HFI is the world's largest UCD firm, offering short courses that provide skills training on UX processes, activities and trends. HFI offers two main tracks for their courses (Human Factors International, 2012c):

- *Certified Usability Analyst (CUA)*: CUA's pass an examination demonstrating their mastery of the fundamental principles of UCD. The courses include:
 - User-centred Analysis and Conceptual Design;
 - The Science and Art of Effective Web and Application Design;
 - Practical Usability Testing;
 - Putting Research into Practice;
- *Certified User Experience Analyst (CXA)*: CXA certification documents a UX practitioner's grasp of advanced UX design skills beyond classic usability. The courses include:
 - How to Design for Persuasion, Emotion and Trust (PET);
 - The PET Architect;
 - How to Design for The Big – User-Centric Innovation and Strategy;
 - How to Support Institutionalisation of a Mature UX Practice (listed in Chapter 3).

UX employees of the WCG completed several of the courses listed above. The next sub-section lists the results of the organisation phase of the IUXG methodology.

7.3.3 Phase C: Organisation

The focus of the organisation phase is to develop a UX team. The results of the steps in the organisation phase are discussed next.

7.3.3.1 C1: Define the UX Organisational Structure

The goal of this section was to define the UX organisational structure. Three types of organisational structures are commonly considered for a permanent UX team (Schaffer, 2004):

- *Matrix:* The central group (not conducting all the work) which supports UX practitioners working with different project teams (medium and large organisations);
- *Centralised:* All UX staff members are in a single team and are assigned temporarily to help on specific projects as required (small organisations);
- *Decentralised:* UX staff members are allocated to specific projects and report up through the various lines of business.

The organisation structure that best describes the current UX team in e-G4C is a centralised structure. All UX staff members are in one team (Wakeford, 2012) and generally work on e-G4C and WCG projects. The UX staff members are temporarily assigned to assist on projects that occur outside of the e-G4C team in the wider WCG. The long-term goal for the WCG is to have a matrix organisational structure. The matrix structure is recommended for large organisations (Schaffer, 2004) such as the WCG. The matrix structure will allow improved UX support for other development teams not part of e-G4C.

In order to have a UX team, an e-Government website team needs to be in place. This research assumed that a PG already has an established general organisational structure to support a website, such as staff (owner/manager; developers; etc.). A separate methodology may be required for PGs on how to institutionalise a website team in a PG and this is identified as future research in Chapter 8. A problem that was identified at the 2012 GCIS Content workshop was that South African PGs exist where established e-Government website teams do not exist and where it was not uncommon to find national departmental websites or PG websites maintained by only one or two people (Levy, 2012c). The next sub-section defines the UX staff recruited for the WCG.

7.3.3.2 C2: Define and Recruit UX Staff

The goal of this step of the IUXG methodology was to define the UX staff needs and to recruit UX staff. The IUXG methodology recommended the following roles (Chapter 4, Sub-section 4.4.3; Chapter 6, Sub-section 6.4.3): UX team leader; Information architect; Interaction designer; User researcher and Graphic designer. Table 7.2 lists the UX staff positions in the WCG between 2010 and 2012. The number of staff has grown from one member in 2010 (later joined by a contract

information architect for six months) to five members in 2012. As UX became more known in the organisation, the number of UX projects increased. The current number of staff (five in 2012) is an improvement since 2010; however, it is still not sufficient for the number of projects requested. A challenge for the WCG is to increase the number of UX staff. More information architects and Web designers are required.

Table 7.2: WCG UX Staff 2010 to 2011		
2010	2011	2012
<ul style="list-style-type: none"> • Usability Team Leader; • Contract Information Architect. 	<ul style="list-style-type: none"> • Usability Team Leader; • Web Designer; • Information Architect. 	<ul style="list-style-type: none"> • Usability Team Leader; • Web Designer; • Information Architect; • Contract Business Analyst (to produce wireframe templates); • User Researcher.
Total: 2	Total: 3	Total: 5

A new UX staff structure has been defined for the e-G4C UX team (Wakeford, 2012) and is expected to be implemented in 2013. The staff structure endured several iterations to accommodate factors such as budget. The UX staff structure was developed in consultation with UX specialist, Prof Darelle van Greunen (LinkedIn, 2012). The UX staff structure is currently being consulted with WCG management and organisational development. The following UX staff structure, together with descriptions of the expected roles, was recommended (Wakeford, 2012):

- *UX Manager* (previously the usability team leader): Manages the UX team, including policy, strategy, projects, research and UX staff. The UX Manager needs to be the lead evangelist of UX. This position was recommended by the IUXG methodology;
- *Information Architect*: Produces prototypes, sitemaps, information architecture and wireframes of websites and systems. This position was recommended by the IUXG methodology. The interaction designer position recommended by the IUXG methodology has been combined into this position. The Information Architect is also responsible for delivering the wireframes;
- *Usability Engineer*: Conducts usability testing, including formal laboratory testing, eye tracking, informal testing, walkthroughs, expert evaluations and heuristic evaluations. The deliverable for this position, usability testing, was part of the user researcher role in the IUXG methodology. This position has been created in order for the specific staff member to focus only on usability testing. The goal of the WCG UX team is that the

usability laboratory (Sub-section 7.3.5.2) should be used almost every working day, making this a full-time position;

- *Senior Web Designer*: Designs concepts and prototypes, implements branding and delivers the full design of a website or system. This position is similar to the Graphic Designer recommended by the IUXG methodology;
- *Web Designer*: Supports the Senior Web Designer to produce design concepts, image and graphic enhancements and design, PSD files and CSS. This position is similar to the graphic designer recommended by the IUXG methodology. The Web Designer will provide support to the Senior Web Designer;
- *User Researcher*: Conducts surveys, questionnaires, interviews, focus groups, personas, user profiles and research. This position was recommended by the IUXG methodology. The User Researcher will not conduct usability testing; however, the User Researcher can support the Usability Engineer;
- *UX Designer*: Supports the Information Architect to produce information architecture and wireframes. The UX designer conducts research on usability and design best practices, current and new technologies (for example, mobile best practices) and assists the Usability Engineer in the usability laboratory. This position is similar to the Information Architect and Interaction Designer roles recommended by the IUXG methodology. The UX Designer will provide support to the Information Architect and Usability Engineer.

The UX staff described above needs support from other staff members in the website development team. These supporting roles are described next.

7.3.3.3 C3: Support Required from Other Staff

The UX team needs to be supported by staff members in the overall website team. The IUXG methodology recommended the support of technology staff, content staff, as well as other supporting staff (Chapter 6, Figure 6.5). It is beyond the scope of this research to define the roles and responsibilities of the supporting staff members; however, definitions of each role are listed in Appendix G. The focus of this sub-section is to describe challenges faced in the supporting roles:

- *Technology*:
 - Sub-section 7.3.2.4 described the challenge of procuring development resources. The lack of technology resources was the leading obstacle to the institutionalising of UX.

All the deliverables and recommendations that the UX team provides for the WCG website are meaningless if they cannot be implemented. Only one developer was present from 2010 to 2011; finally, during 2012, the technology team grew to four staff members.

- The additional developers have assisted in making progress with the WCG website; however, more developers are required to implement new wireframes and design recommendations for the WCG website.
- *Content:*
 - The main problem in the content area was ownership (Chapter 6, follow-up survey results). Poor content is an immediate negative reflection on the UX of the WCG e-Government website. E-G4C is responsible for transversal content on the WCG e-Government website where departments are responsible for the content in their areas of the websites and for content which is related to their business. These responsibilities are often deliberated but not understood by all stakeholders. The correct content owners do not always take responsibility for online content. The recommendation to overcome this challenge is to have an online content policy (Sub-section 7.3.2.2) that specifically states roles and responsibilities.
 - Improvements have been made in the content area in the WCG in the past two years (2011 and 2012). A managing editor was employed to manage the e-G4C content team. Online content policy and guidelines were developed and distributed to content stakeholders (Bevan, 2012a; Bevan, 2012b).

The list above described the challenges faced by the content and technical teams in e-G4C. Due to a limited number of developers, continuous technical resource procurement work is conducted; however, this area remains a challenge for the WCG. Content will remain a challenge for the WCG while stakeholders are not taking responsibility for their WCG website content. The use of contractors in e-Government website projects is discussed next.

7.3.3.4 C4: Using Contractors

The IUXG methodology recommended the following steps when contractors are used: write a statement of work; work collaboratively and transfer the skill to the in-house team. It is standard in the WCG to write a statement of work before any contractor can be procured. E-G4C has had both good and poor experiences with contractors. Poor experiences with contractors occurred when there

was a lack of buy-in from stakeholders, a lack of content ownership and a lack of collaborative work. The good experiences occurred when collaborative work occurred.

An example of a project where collaborative work was done was the Safely Home Project (www.westerncape.gov.za/safelyhome). The contracting company was procured to deliver the design of the website. The e-G4C team delivered the wireframes for the project (Pretorius, 2011c) and presented and discussed these with the contracting company. The contracting company used the wireframes to deliver the design (Western Cape Government, 2012e). The e-G4C Web designer worked in collaboration with the contracting company. Design skills were transferred and design templates were provided to the e-G4C Web designer.

Contractors can be used effectively if there is a statement of work, including roles and responsibilities, with buy-in from all stakeholders. If the work is done in a collaborative way, it maximises the chances of transferring skills to the in-house team. The method used to conduct UX work is discussed next.

7.3.4 Phase D: Method

The focus of the method phase is to demonstrate what steps are required when conducting a UX project. The results of the steps in the method phase are discussed next. The individual steps in the method phase were deemed successful if they were included in the updated SDLC (Appendix F; Sub-section 7.3.5.3).

7.3.4.1 D1: Determine the Need for UX

The IUGX methodology recommends that the following questions are asked when a new project is started to determine the need for UX:

- *Question 1: How important is the project within e-G4C and the WCG?*
 - Question 1 was covered in the e-G4C project brief (Sub-section 7.3.4.3) and assisted e-G4C in determining project prioritisation (Western Cape Government, 2012f).
- *Question 2: How important is UX to this project?*
 - Not all projects required UX involvement. If an incoming project was deemed as only a content or technology update, the UX team was not involved. The UX team were available for quality assurance or consultation on these projects as necessary.

- *Question 3:* How likely is it that the before and after benefits of UX can be measured in this project?
 - Heuristic evaluations, usability studies and website analytics could be conducted on websites that required improvements. This question proved not to be applicable for new projects (new websites).
- *Question 4:* How supportive is the project manager of UCD?
 - Support was always provided for UCD on WCG website work conducted by e-G4C. Resistance in areas of wider WCG projects still exists.

These questions proved to be important questions to ask during the planning of a project. This step was included in the updated SDLC (Sub-section 7.3.5.3). The next sub-section describes the type of sites in the WCG.

7.3.4.2 D2: Identify the Type of Site

The goal of this step was to identify the type of site for a new website project. The IUXG methodology listed a brand presence, marketing campaign, content source and task-based as the possible types of sites. The type of project requests received by e-G4C demonstrated that the following are typical WCG e-Government types of sites:

- *Informational:* The goal of this site is to provide information regarding a specific topic (for example, the WCG news and speeches page);
- *Transactional:* The goal of this site is for the user to complete a transaction, such as filling in a form (for example, the WCG online job application page);
- *Campaign:* The goal of this site is to promote a specific topic. A campaign can be informational and/or transactional (for example, the WCG Safely Home website);
- *Social media:* The goal is to have a social media presence in order to interact with citizens (for example, the 110% Green page on Facebook, www.facebook.com/110Green).

This step of the IUXG methodology will be updated to replace the current types of sites with those described above. This step was included in the updated SDLC (Sub-section 7.3.5.3). The next sub-section describes the proposal for a new website project.

7.3.4.3 D3: Create a Proposal

The IUXG methodology recommended the creation of a project proposal which included the following elements: project overview; project approach; scope of work; deliverables; ownership; costs and sign-off. E-G4C had challenges in this regard in 2010 and 2011 as many ad hoc projects were not properly defined. In 2012, a project brief was created and institutionalised (Western Cape Government, 2012f) and served as a project proposal. Any client had to complete the project brief in conjunction with the e-G4C team in order for work to be defined and conducted. The e-G4C project brief has the following elements (Western Cape Government, 2012f):

- General e-G4C policy on creating WCG websites;
- A high-level methodology listing SDLC activities that need to be conducted (project approach);
- Definition of roles and responsibilities (ownership);
- Situation analysis, including the project overview and alignment to WCG strategic objectives;
- Technical and infrastructure considerations;
- Content and UX considerations;
- Scope of work and deliverable;
- Project management agreement, including costs;
- Sign-off.

The recommended proposal elements of the IUXG methodology are present in the e-G4C project brief. The requirement to complete the e-G4C project brief was included in the updated SDLC (Sub-section 7.3.5.3). The next sub-section describes the planning of a project.

7.3.4.4 D4: Plan the Project

The goal of project planning is to start with clear project approach and objectives. The e-G4C project brief, as discussed in the previous section, assisted in project planning. The WCG website Programme Manager together with a project manager plans a new project with the UX, Content and Technology work streams in e-G4C after the completion of the project brief by a client. The IUXG methodology recommended the following elements for the project plan:

- Determine the project priority;
- Clarify project objectives;
- Understand the project approach (lifecycle);

- Refine the project scope;
- Define roles and responsibilities;
- Assemble a project team;
- Plan UX activities and documentation;
- Document the plan.

The recommended elements were included in the e-G4C project planning workshops. Additionally, these sub-steps were included in the updated SDLC (Sub-section 7.3.5.3). The next sub-section describes the business requirements of a project.

7.3.4.5 D5: Develop Business Requirements

Business requirements describe why a project is initiated, what the project will achieve and the metrics that will be used to measure its success. The WCG officials noted in the follow-up survey (Chapter 6, Section 6.3) that business requirements are developed, but that improvement is needed. During this research, a formal business requirements process was rarely conducted. Business requirements in the WCG are normally conducted by business analysts. E-G4C did not have business analysts in the staff structure during this research study.

The result of the lack of staff capacity was that business requirements are normally developed informally. Meetings were held with business owners and stakeholders to determine their requirements. The business requirements were not always agreed upon or captured in minutes. This procedure led to several miscommunications and misunderstandings between the business owners and e-G4C.

In order to improve business requirements for e-G4C projects, the following actions were taken:

- Business analyst positions were added to the future e-G4C staff structure (Wakeford, 2012). Dedicated staff members will be developing business requirements in the long-term. The staff structure is currently in the approval process;
- Contract business analysts were used for selected projects;
- The business requirements step was included in the updated SDLC (Sub-section 7.3.5.3).

The next sub-section describes user research in the method phase.

7.3.4.6 D6: Conduct User Research

Knowledge about the intended users of a website is required in order to design a website in a UX perspective. A UX process needs to consider user expectations and goals in order to be successful. At the start of this research study, limited WCG website user information or statistics were available. User research was conducted for the WCG website throughout this research study. The user research methods included the following:

- *Surveys*: Demographics and background information about the WCG website’s current (2010) users, listed in Table 7.3, were collected through an online survey (Western Cape Government, 2010). 1275 responses were collected, illustrating that 71.69% of the participants were based in Cape Town. The results indicated that the users of the portal speak Afrikaans, English and Xhosa, the official languages of the Western Cape;

Table 7.3: WCG Website User Profile as found by surveys	
Gender:	Male or Female
Education:	Grade 12, Diploma, Degree
Language:	Afrikaans, English, Xhosa
Ethnic grouping:	White, Coloured, Black
Age:	19-50
Location:	Cape Town

- *Focus groups*: The goal of the focus groups (conducted in 2010) was to engage with the typical users of the WCG website. Sub-section 7.3.1.2 discussed the results and user groups of the focus groups (Pretorius and Saunders, 2011);
 - E-G4C is currently (end of 2012) conducting research using focus groups with contact centre staff and citizens of the Western Cape. The goal of the focus groups is to learn more about the users and potential new users of the WCG website. E-G4C is conducting an exercise to optimise the WCG website for mobile devices. This will make the website available to more users, including users with fewer e-skills and less education;
- *Google Analytics*: A Google Analytics account was created (Google Analytics, 2012) in order to track detailed statistics about the visits to the WCG website (Sub-section 7.3.6.3).

User research activities are conducted as described above; however, they are not conducted for every website project. User research was included in the updated SDLC (Sub-section 7.3.5.3) in

order that research is conducted more frequently. The next sub-section describes the design of the site.

7.3.4.7 D7: Design the Site

After the requirements of the website have been gathered (business and user requirements) the website can be designed. The IUXG methodology recommended the following sub-steps:

- *Collect requirements:* Business requirements (Sub-section 7.3.4.5) and user requirements (Sub-section 7.3.4.6), as described in the sub-section above, are required to design the website. Furthermore, a content inventory (a list of all the content on a website) is required. Sub-section 7.3.4.5 described that business requirements were not formally developed in e-G4C. Business requirements were determined by meeting with stakeholders. A high-level content inventory was normally created in these meetings;
- *Implement a content strategy:*
 - A content strategy refers to the planning, development, and management of website content. The lack of content ownership by stakeholders proved to be a challenge for the e-G4C project team (Sub-section 7.3.3.3). Certain departments rarely had the capacity to take ownership of their WCG website content. A drug information website had a significant website traffic drop due to the lack of content and content ownership (Google Analytics, 2012). Correct draft content was absent during the wireframe and design process. The site was developed, implementing the wireframes and design; however, the envisioned content was never uploaded. The content was poor and the amount of traffic to the website demonstrated that the site was not being utilised;
 - Jeffrey Zeldman states that “*design in the absence of content is not design, it is decoration*” (Gócza, 2010: 1). Content is by far the most important element in user interface design (Gócza, 2010). The lesson learnt from this project was not to design or wireframe without draft content;
 - Content remains a challenge for the WCG, specifically for department websites. E-G4C contracted a content strategist in 2012 to provide a content strategy for the WCG e-Government website. The content strategy will be completed by the end of 2012 and will assist the wireframing process for future iterations of the website. Furthermore, the e-G4C project brief (Western Cape Government, 2012f) and

updated SDLC (Appendix F) state that draft content is required before wireframing and design can commence;

- *Identify and document user tasks and workflows:* Google Analytics was used to define the top tasks that users currently perform when visiting the WCG website (Sub-section 7.3.6.3). Additionally, Sub-section 7.3.4.6 described focus groups that were conducted in order to determine potential, new user tasks when the WCG website will be available for mobile device users;
- *Determine site structure and navigation:* Wireframes were used to describe the structure and navigation of a website (Pretorius, 2011c; Saunders, 2011). A wireframe represents the basic page layout structure and navigational scheme of a website, as well as major website components (Shorr, 2011). Balsamiq (www.balsamiq.com) was used as the official wireframing tool in the e-G4C team. Paper and Microsoft PowerPoint was used before Balsamiq was available. Wireframes were identified as an official WCG UX method in Sub-section 7.3.2.3;
- *Conduct search engine optimisation (SEO):*
 - The Western Cape Government website was listed as the top Google search result for the following keywords (as on 25 October 2012):
 - Western Cape Government;
 - Western Cape Provincial Government;
 - Western Cape;
 - The old WCG website CMS, still used for the majority of pages, provides challenges in tagging website content. The new CMS, Drupal, allows for tagging of content which will improve the SEO of the WCG website. The WCG website is currently being redesigned to provide an enhanced site structure and enriched page-naming to improve the WCG website SEO;
- *Develop prototypes:* A prototype, a draft version of a website, allows for the exploration of ideas before investing time and money into development. E-G4C used wireframes (described above) as prototypes (Pretorius, 2011c; Saunders, 2011). The wireframe prototypes were presented to stakeholders and reviewed before development commenced. Additionally, the Balsamiq wireframing tool allowed for wireframes to be used interactively by users;
- *Collect user feedback:* User feedback was collected by means of focus groups (Sub-section 7.3.1.2), usability testing (Sub-section 7.3.4.9) and surveys (Sub-section 7.3.2.3);

- *Design the site:*
 - Web design was identified as an official WCG UX method in Sub-section 7.3.2.3. Web design was included in the majority of e-G4C website projects. A professionally skilled Web designer is required for a successful Web design; therefore, e-G4C recruited a Web designer in early 2011. The following software is used by the Web designer:
 - Adobe Photoshop is image editing software used to create graphic designs and to enhance images and graphics;
 - Adobe Fireworks is used to design and to prototype website, mobile and application interfaces and to optimise Web graphics;
 - Adobe Dreamweaver is used for developing HTML websites;
 - E-G4C made use of a stock photography services in order to easily find images that can be used on the website. This had a positive impact on the design process as new and professional images were always available (for example, the WCG website homepage has a carousel where new images are constantly used);
- *Evaluate the site:*
 - Sub-section 7.3.2.3 identified usability laboratory testing and heuristic evaluations as the official WCG usability testing methods:
 - Usability laboratory testing: The WCG approved the construction of a usability laboratory in 2011. Planning and construction of the usability laboratory started in 2011 and was completed in 2012. Sub-section 7.3.5.2 describes the setup of the usability laboratory. The new laboratory allowed formal usability laboratory testing to be conducted on WCG website projects (Pretorius, 2012d). Sub-section 7.3.4.9 lists the usability results of the online bursary usability study;
 - Heuristic evaluations: Before the usability laboratory was completed, heuristic evaluations were conducted on WCG website projects (Pretorius, 2012b);
- *Implement accessibility guidelines:*
 - Accessibility guidelines, such as those recommended by the World Wide Web Consortium (1999), were not strictly implemented on the WCG e-Government website during this research. The WCG UX strategy, policy and guidelines (Pretorius, 2012h) (Sub-section 7.3.2.1) included accessibility guidelines from the

World Wide Web Consortium (1999). Moving the WCG e-Government website to the new Drupal CMS platform will allow for these accessibility guidelines to be implemented;

- E-G4C piloted text reading software in 2012 thus allowing an audio version of content on the website to be read to the user. The software allows a user to click a “*listen*” button. This is followed by the software reading the content of the page to the user (ReadSpeaker, 2012). The software improves the UX for users with visual impairments and dyslexia (ReadSpeaker, 2012). Furthermore, the software assists users whose native language is not that of the website. The pilot of the software was successful; therefore, e-G4C started an exercise to implement the reading software on the WCG e-Government website towards the end of 2012.

Each sub-step of the “*design the site*” step described above was included in the updated SDLC (Sub-section 7.3.5.3). Obtaining sign-off (approval) in this step of the IUXG methodology proved to be a challenge in certain projects as stakeholders can take much time to sign off. The lesson learnt for sign-off was that meetings are the most effective way to present wireframes and designs and to obtain sign-off. Presentations have to be scheduled far in advance. Stakeholders who cannot attend these presentations have to send representatives, who can sign off on their behalf. Further, draft content must be provided before the wireframe and design process starts.

The implementation of the WCG corporate brand needs to be added to this step of the IUXG methodology. The brand of the WCG has to be reflected on the WCG e-Government website. It is important to create flexible solutions for the website, as the branding can change every time a new political party is in control of the PG. The UX team worked closely with the Corporate Communication team (custodians of the WCG brand) to define the best solutions for Online implementation. The branding should not negatively affect the UX of the website; for example, if the logo is big, it needs to be resized for Online as it cannot take most of the area above the fold for a website.

Figure 7.4 and Figure 7.5 demonstrates the old and new branding in the top area of the WCG e-Government website. The old branding (Figure 7.4) includes the Cape Gateway name. The new branding (Figure 7.5) includes the new WCG logo and a stronger connection to the WCG.

Figure 7.4: Old Branding on the WCG Website



Figure 7.5: New Branding on the WCG Website

The creation of the domain name needs to be added to this step of the IUXG methodology. Citizens trust websites with a “.gov” extension (Human Factors International, 2012b). After the WCG brand change, the website name changed from *capegateway.gov.za* to *westerncape.gov.za*. Other extensions, such as “.co.za” and “.org” should not be used for WCG websites. After the website has been designed, development of the website can start. The development of the WCG e-Government website is discussed next.

7.3.4.8 D8: Develop the Site

The next step in the IUXG methodology is for development to commence, based on the wireframes and designs. The specific details of the development step are beyond the focus of this study; however, challenges faced are discussed next. The original CMS, Bee, on which the website was built is still being used after almost ten years and is becoming unstable (Levy, 2012b). The CMS enables government content-publishing teams to publish on the Web; however, in 2012, publishing and updating content on the CMS became difficult and time consuming. A decision was made to migrate to a new CMS, Drupal. Further, e-G4C lacked developer capacity to move to the new Drupal CMS standard (Levy, 2012b). A modern CMS and developer capacity are required in order to successfully develop a website. The next sub-section discusses the testing and refining of a site.

7.3.4.9 D9: Test and Refine the Site

The sub-step of Sub-section 7.3.4.7, “*evaluate the site*” is repeated in this step. This step recommends that the website should be evaluated, that recommendations are implemented and that the website is retested until the usability goals are achieved. Sub-section 7.3.5.2 elaborates on a usability laboratory that was built for e-G4C. Usability studies at e-G4C are conducted using the

usability and eye tracking methodology by Pretorius and Calitz (2010). The methodology (Pretorius and Calitz, 2010; Appendix L) is listed in Table 7.4.

Step 11 of Table 7.4 lists the recruitment of participants. It is important to select participants who are representative of the background and abilities of the intended users of the website (Pretorius and Calitz, 2010). It is important to consider both expert and non-expert participants when South Africans are the intended users, as well as participants with different first languages (Pretorius and Calitz, 2010; Pretorius and Van Biljon, 2010; Pretorius, Van Biljon and De Kock, 2010).

Table 7.4: Usability Testing Methodology	
Source: Pretorius and Calitz, 2010: 117.	
Step	Step description
1	Establish the team.
2	Define the product issues and audience.
3	Formulate the research hypothesis.
4	Set goals and define usability measurements.
5	Define eye tracking metrics.
6	Establish the user profile.
7	Select the tasks to include in the test.
8	Determine how to categorise/analyse results.
9	Develop and write the test plan.
10	Prepare the test materials, environment and team.
11	Recruit the test participants (experts and non-experts).
12	Conduct a pilot test.
13	Conduct the usability test.
14	Tabulate and analyse the data.
15	Recommend changes.
16	Report the results.

The first official usability study in the WCG usability laboratory was on the Department of Health bursary website. This website was not developed by e-G4C, but by a different department in the WCG. The website was developed without any UX methods being applied. A UX presentation that was conducted in the startup phase resulted in the owners of the website learning about UX and the usability laboratory. The owners of the health website requested usability testing on the website. It was clear that there would not be enough time to implement the usability study recommendations, because of a previously announced and agreed launch date of the website. The decision was however made by the UX team leader to continue with usability testing in order to evangelise the concept.

It is beyond the scope of this research to explain the detailed results of the study (Pretorius, 2012d); however, key results are demonstrated to feature the type of results that can be extracted from usability testing. The first key result showed that only 33% of participants managed to register successfully for a bursary online. The average task completion time was over 30 minutes. Participants had trouble using the bursary website.

The second key result showed that participants did not read big blocks of text on the website. An example is shown on a heat map in Figure 7.6. A heat map shows the fixations of a participant, where the “hot” colours indicate areas most fixated on by participants. Further, help instructions on the right (Figure 7.6) were ignored by participants. The help text was not located near the action item of the screen, a link to apply for a bursary. The screen was not designed in a 1024x768 resolution (an e-G4C standard) which forced users to scroll horizontally to access the help information. Horizontal scrolling is a major UX pitfall (Nielsen and Loranger, 2006).



Figure 7.6: Eye Tracking Heat Map

The results of this usability study were presented to key stakeholders and management of the website (Pretorius, 2012d). The stakeholders agreed that recommendations would be implemented before the next round of online bursary advertisements. The next sub-section discusses the launching of the site.

7.3.4.10 D10: Launch the Site

After the site has been designed, developed and tested it can be launched (accessible for the public). The IUXG methodology recommended the following sub-steps:

- *Create and set up the required social media accounts beforehand:* A Twitter account was created for the WCG (@westerncapegov). The WCG Twitter account provides WCG news and information and links back to the WCG e-Government website. Social media policy, strategy and implementation guidelines are required for social media accounts (Sub-section 7.3.2.2);
- *Do cross-browser checks:* Cross-browser checks were implemented for the WCG e-Government website and were included in the updated SDLC (Pretorius, 2012c);
- *Proofread existing content:* The role of Language Editors in the e-G4C content team is to proofread content before it is published;
- *Create a content plan:* The e-G4C content team has a three to six month content plan for the WCG e-Government website (Western Cape Government, 2012g);
- *Market the upcoming launch:* Comprehensive marketing campaigns were not prepared for WCG e-Government website during the years of this research. Citizens will not use a website if they are not aware that a service is available online or if they cannot find it (Eggers, 2005). Marketing of the WCG website is now required for more citizens to be aware of the WCG website;
 - A communication challenge was experienced during the Safely Home website launch where an incorrect link was provided in a press statement. The link of the site was “<http://safelyhome.westerncape.gov.za>” while the published link was “<http://www.safelyhome.westerncape.gov.za>.” It was also noted that, when the correct link was given to the press in a second launch in 2012, certain members of the press still included the “www”. The lesson learnt for e-G4C is to name websites with the “www” included, as it is assumed that a website has to have a “www” prefix. Additionally, if a website domain cannot be changed, the “www” prefix has to be registered also, with a redirect to the correct link;
- *Plan design and implementation tasks for after the launch:* The Programme Manager of the WCG website maintains a design and implementation plan for the WCG website;
- *Check the technical details before going live:* Quality checks, such as checking that all hyperlinks are working, were implemented at e-G4C;

- *Launch on schedule:* A lesson learnt during the launch of a new website was to plan the project to avoid development in the days approaching the launch. Development on the launch day is risky, as elements of the website can malfunction, thus causing a website that is not functioning correctly when citizen and media attention are focused on it.

The sub-steps described above were included in the updated SDLC (Sub-section 7.3.5.3). The next sub-section describes the support required after a website launch.

7.3.4.11 D11: Deliver Support After the Launch

After a website is launched, the following support is required:

- *Implement change management:* No formal change management process currently exists in e-G4C. Change management has been identified as a gap and has been included in the updated SDLC;
- *Conduct user training:* The E-G4C Content team has the responsibility to train back-end users to use the CMS to upload and update content;
- *Provide customer support:* The WCG has a contact centre that provides telephone and e-mail support (Western Cape Government, 2012h). The WCG walk-in centre also allows citizens to interact directly with contact centre officials;
- *Determine the impact on the organisation and stakeholders:* This sub-step should link to business requirements where the envisioned impact on the organisation and stakeholders would be identified. E-G4C measured the impact on the organisation by means of user feedback surveys and analytics (Sub-section 7.3.4.6);
- *Collect analytics:* Google Analytics was used to collect analytics about the WCG e-Government website. Table 7.5 lists WCG website statistics and is discussed in Sub-section 7.3.6.3;
- *Work through iterations:* Website projects (such as the home page, about us, contact us, news and speeches, tenders, jobs, Safely Home) were worked through, in iterations, to improve the websites.

After launch support was included in the updated SDLC (Sub-section 7.3.5.3). Phase E, standards, is discussed next.

7.3.5 Phase E: Standards

The focus of the standards phase is to minimise rework, enforce consistency and to take advantage of what is already known about best practices. The results of the steps in the standards phase are discussed in the following sub-sections.

7.3.5.1 E1: Create Templates

The use of templates assists in effective completion of the method phase. After using the method for initial projects, templates start to formalise and standardise. The IUXG methodology recommended templates for documents and forms, as well as for interface design standards. The following documents and form templates were created: informed consent form; usability testing planning document; screening questionnaire; post-test questionnaire; usability results report; focus group planning document and report and an online survey.

Initial interface design standards were created when the new WCG branding was released. A design template was created (Figure 7.5) including the WCG logo and blue progress line which should be visible as the top banner for any WCG website or system. Branding templates were also created for each department on the WCG e-Government website (Western Cape Government, 2012h). As the UX team conducted more projects, the wireframes and designs of previous projects were used as wireframe and design templates. These templates were customised according to each project's requirements.

The UX team is currently (end 2012) in the process of developing a template project to make wireframe templates available to the whole WCG (Pietersen, 2012). The exercise consists of identifying existing WCG applications and identifying common screens (such as login and registration). The wireframe templates for these screens would then be placed in a dedicated space on the Intranet, available to all WCG developers (Pietersen, 2012). The long-term goal for this template project is to include development code templates as well. The next sub-section discusses the usability laboratory of the WCG.

7.3.5.2 E2: Create a Testing Facility

The goal of this step was to create a usability testing facility. E-G4C initiated a project to build a usability laboratory, a state-of-the-art facility designed to support the observation of human-computer interaction (Van Greunen, 2002). Users are brought into a controlled environment, in

which they are asked to do specific tasks within specific timeframes. Evaluators observe the problem(s) the participant might have, videotape the participant and then analyse the observational logs and videotapes.

The construction plan for the usability laboratory is illustrated in Figure 7.7. The usability laboratory consists of two rooms, an observer room and a participant room divided by a one-way mirror. The observer room allows usability analysts and other observers to view the study. The participant room provides a place for the participant to perform the tasks required for the usability study. Both rooms have an air-conditioner and are soundproof. Two doors were installed, one providing access to the usability laboratory (observer room) and a door between the observer and participant room.

The observer room (Figure 7.8, top-left and bottom) consists of the following elements:

- One personal computer (PC) to facilitate observations;
- Three monitors to display the participant's screen and actions;
- Software: Tobii Studio Observer;
- Speakers;
- Table and chairs;
- Bookshelf;
- Adjustable lighting.

The participant room (Figure 7.8, top-right) consists of the following elements:

- One PC to facilitate recording of usability data;
- One Tobii T60 eye tracker, allowing the eye movements of participants on the screen to be recorded;
- Software: Tobii Studio;
- Speakers and microphone;
- Table and chairs.

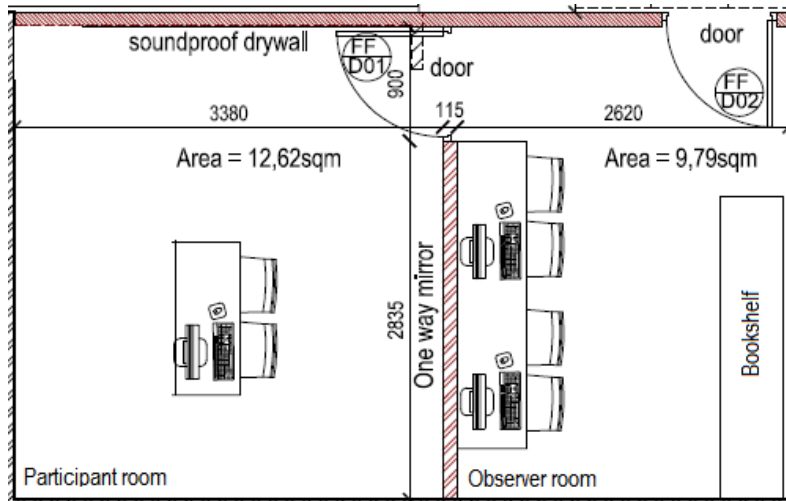


Figure 7.7: WCG Usability Laboratory Construction Plan

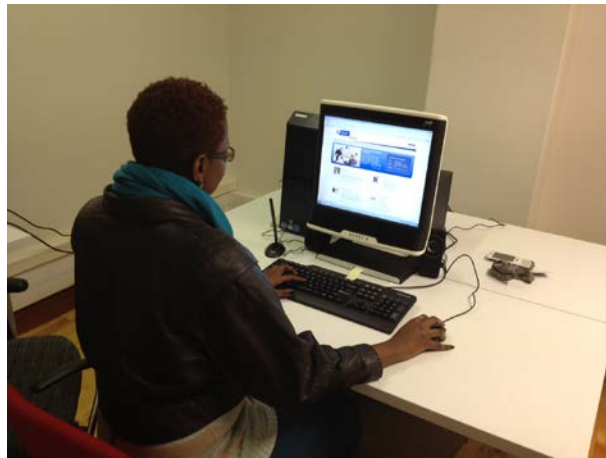
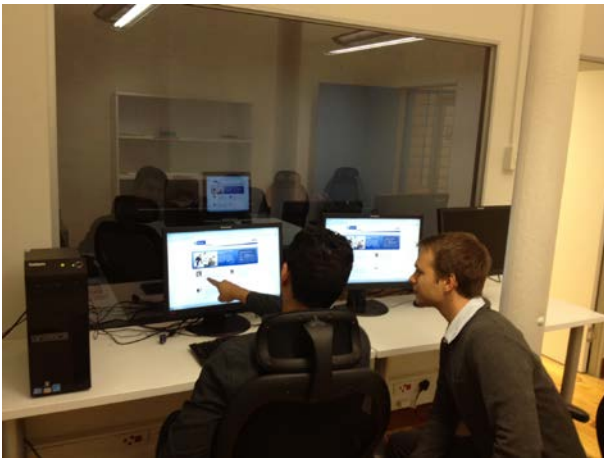


Figure 7.8: WCG Usability Laboratory: Observer Room and Participant Room

The usability laboratory was completed in 2012 and was the first usability laboratory for a South African PG. A dedicated usability testing facility shows a commitment to testing within the organisation (Schaffer, 2004). PGs that cannot afford a usability testing facility can use a conference room to run tests. It is critical, however, that the room must be reasonably quiet and free of interruptions (Schaffer, 2004; Usability.gov, 2012b). A user's home or work space can even be used, without recording equipment, as long as the user is observed and notes are taken (Usability.gov, 2012b). The next sub-section discusses the standardisation of the SDLC, including usability testing as a step.

7.3.5.3 E3: Standardise Processes

The goal of this step was to standardise the UCD process in the SDLC. Sub-section 7.3.2.5 identified the initial SDLC process that was used by e-G4C which incorporated UX activities. The proposed SDLC was refined after every WCG e-Government website project and became standard practice in the e-G4C environment.

The follow-up survey results (Chapter 6) showed that UCD is not applied in the broader WCG SDLC. The WCG has an internal SDLC document providing a framework to be used for software acquisition, enhancement and development (Hofmeester, 2011). Based on the follow-up survey results, an internal investigation was completed to investigate if the SDLC adequately includes UX, applied through UCD (Pretorius, 2012a).

The findings concluded that UX and UCD were not adequately covered in the SDLC (Pretorius, 2012a). The following were highlights of the findings (Pretorius, 2012a):

- The words "*usability*", "*UX*" or "*UCD*" were not mentioned in the SDLC document;
- Usability and UX roles were not included in the roles and responsibilities listed in the document;
- Direct user (actual user) involvement was not discussed in the document;
- UX methods such as usability testing, wireframing and heuristic evaluations were not cited in the document;
- The responsible person for the design of the graphical user interface was identified as the developer.

A revised SDLC was proposed to senior management to include UCD (Pretorius, 2012c). The proposed SDLC was reviewed by e-G4C staff and the WCG Corporate Governance team. The proposed SDLC (Pretorius, 2012c), illustrated in Appendix F, is currently in a pilot phase to demonstrate the before and after benefits. The next sub-section discusses the compilation of best practices and guidelines.

7.3.5.4 E4: Compile Best Practices and Guidelines

The goal of this step is to compile UX best practices and guidelines. During 2012, a first draft document of official WCG UX policy, strategy and guidelines was released (Pretorius, 2012h). This document provided a list of usability, design and UX guidelines to be applied to WCG websites and systems. Additionally, a list of UX resources was compiled listing the popular UX resources used by the UX team. The list consists of website links, books and Twitter users and is available in Appendix H. The next sub-section describes the results of the long-term phase.

7.3.6 Phase F: Long-term

The long-term phase focuses on the management and long-term considerations to keep UX institutionalised in government. The results of the steps in the long-term phase are discussed next. Every step in the long-term phase is an on-going exercise which should be revisited continuously.

7.3.6.1 F1: Maintain the Management Relationship

The goal of this step was to maintain the management relationship by keeping UX effective and respected. The sub-steps included:

- *Maintain respect:* The UX team needs to maintain enough respect for users' needs to be fulfilled without being marginalised, ignored or overrun, because technology takes precedence over usability. This goal was achieved through continuous UX presentations to WCG senior management and by showcasing UX work conducted (Sub-section 7.3.1.7). Further, the work on the updated SDLC (Sub-section 7.3.5.3) and the establishment of UX strategy, policy and guidelines (Sub-section 7.3.2.1) kept management involved in UX projects;
- *Maintain momentum:* The IUXG methodology will be updated to combine this sub-step with the sub-step, maintain respect, above. Maintaining momentum was achieved through the same methods as those listed above;

- *Take responsibility:* The UX team leader took responsibility for usability throughout the organisation by taking ownership and by delivering UX strategy, policy and guidelines (Sub-section 7.3.2.1) that must be adhered to by all WCG websites and systems. Responsibility and ownership were also taken by means of the updated SDLC project (Sub-section 7.3.5.3) and the wider WCG template project (Sub-section 7.3.5.1);
- *Report to executives:* Progress and achievements were reported to the Director of e-G4C. UX presentations to WCG senior management were conducted to showcase UX work completed (Sub-section 7.3.1.7);
- *Evangelise:* This sub-step is discussed in the next sub-section.

The list above described the activities required to maintain relationship with WCG management. The next sub-section discusses the maintaining of UX awareness.

7.3.6.2 F2: Maintain UX Awareness

Maintaining UX awareness should be an on-going practice. UX was evangelised as follows:

- UX presentations were conducted to evangelise the concepts of usability and UX in e-G4C and the WCG (Sub-section 7.3.1.7);
- UX success stories and improvements were showcased (Sub-section 7.3.1.7);
- “*Fix-it Fridays*” sessions with departments were held in order to improve their presence on the WCG website (Sub-section 7.3.1.7);
- Findings from UX methods, such as focus groups and usability testing, were documented as official WCG documents.

This step is strongly correlated with the *obtain buy-in* step in phase A, startup. The next sub-section describes the collection of metrics.

7.3.6.3 F3: Collect Metrics

The goal of this step was to collect metrics to demonstrate that the investment in UX is providing results:

- *Collect and measure UX business metrics:* The main purpose of these metrics is to validate that UX work is actually being conducted and to show the growth and stability of UX in the organisation. The number of staff hired and trained and the number of staff working on UX issues and projects was tracked. The UX maturity of the WCG was measured before and

after this research study (Sub-section 7.3.1.1; Chapter 6; Chapter 7) to demonstrate the growth of UX in the WCG;

- *Collect and measure website analytics:* A Google Analytics (www.google.com/analytics) account was created to track detailed statistics about the visits to the WCG website. Table 7.5 illustrates the key website analytics for the financial years of 2010/2011 and 2011/2012. The number of unique visitors (defined below) increased from 1 829 930 in 2010/2011 to 3 019 828 in 2011/2012. The complete statistics (results) of 2012/2013 are not yet available; however, in the first six months (1 April 2012 to 30 September 2012), the number of unique visitors was 2 034 095, more than the number for the full 2010/2011 year. Table 7.5 shows the number of visits, unique visitors and page views for the WCG e-Government website. The definitions of the metrics used in Table 7.5 are as follows (Google Analytics, 2012):
 - *Visits:* The number of visits to the website;
 - *Unique visitors:* The number of unduplicated (counted only once) visitors to the website over the course of a specified time period;
 - *Pageviews:* The total number of pages viewed. Repeated views of a single page are counted;

Table 7.5: WCG Website Statistics			
Year	Visits	Unique visitors	Pageviews
2010/2011	3 154 799	1 829 930	11 214 312
2011/2012	4 623 221	3 019 828	15 272 805

- *Collect and measure usability testing metrics:* Usability testing metrics, such as task completion time, number and percentage of tasks completed correctly with and without assistance and the number of errors, were collected in the usability laboratory (Pretorius, 2012d);
- *Collect and measure customer feedback:* Customer feedback was collected through surveys and focus groups with the e-G4C contact centre (e-mail, call, walk-in centres) (Sub-section 7.3.1.2).

The list above described the collection of required metrics for the UX team. Metrics should be collected on a continuous basis and compared with previous metrics to measure improvement. The next sub-section discusses adherence to laws and regulations.

7.3.6.4 F4: Adhere to Laws and Regulations

Chapter 6 (Table 6.1: Long-term) listed the laws and regulations that a PG should consider when developing an e-Government website. The analysis of each law and regulation is beyond the scope of this study; however, it must be noted that there is no current law or regulation in South Africa that addresses UX directly (such as accessibility laws in the United States). The WCG will release the official WCG e-Government strategy in 2013 (Western Cape Government, 2012d), which will have an impact on the WCG e-Government website.

Further, the provincial strategic objectives (PSOs) in the WCG (Chapter 6), specifically PSO12 provide for a call for UX with an outcome of PSO12 being the “*implementation of the citizen-centric philosophy by continuously improving citizens’ experience in their interaction with the Western Cape Government*” (Western Cape Government, 2011a: 2). The next sub-section discusses the WCG’s implementation of latest trends and research.

7.3.6.5 F5: Stay Up to Date with Latest Trends and Research

The goal of this step was to stay current with latest research, trends and best practices. The IUXG methodology recommended the following sub-steps:

- *Conduct training*: Knowledge and skills training was conducted (Sub-section 7.3.2.6);
- *Attend conferences and industry events*: The UX team leader attended conferences where academic research papers were submitted, including the European Conference on e-Government (Pretorius and Calitz, 2012) and the e-Skills Summit (Pretorius and Van Biljon, 2010). Industry events included the Nelson Mandela Metropolitan University Industry Day (Pretorius, 2011b) and the Unisa eye tracking industry event (Pretorius, 2012f);
- *Keep up to date with best practices*: Sub-section 7.3.5.4 (Appendix H) identified UX resources that were put into use to keep abreast of best practices;
- *Compile a list of resources*: Sub-section 7.3.5.4, as stated above, identified a list of UX resources;
- Chapter 6 identified a list of trends that should be considered. Table 7.6 lists the trends and relevant WCG actions that were taken. The trends included: mobile; responsive design; social media; semantic Web; Customer Relationship Management (CRM); transactional services; user generated content; Application Programme Interface (API) and open data; the use of multimedia and open source. Figure 7.9 illustrates how responsive design (described in Table 7.6) can work for the current WCG e-Government website layout. The layout on

the far left shows the current layout on a desktop. This layout is customised as the device screen becomes smaller (tablet, smart phone, mobile device).

The results discussed in Section 7.3 for the WCG allows for the compilation of a gap analysis. A gap analysis is a technique for determining the steps to be taken in moving from a current state to a desired future state (BusinessDictionary.com, 2012). Appendix I illustrates the gap analysis for the WCG based on the case study results for the proposed IUXG methodology.

The gap analysis identified 23 steps that were implemented successfully; 12 steps that required more work and two steps that have shown limited implementation. The major challenges for the WCG to institutionalise UX (as indicated by the red steps in Appendix I), include:

- A lack of content ownership by departments;
- A lack of development resources;
- A legacy and unstable CMS platform used for WCG e-government website. The website is being migrated to the new Drupal CMS, but much work is still required.

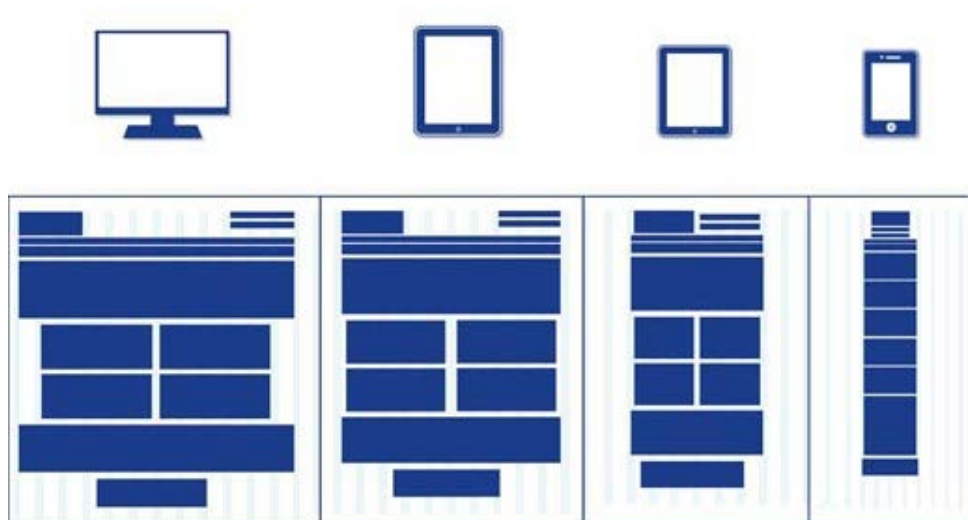


Figure 7.9: Responsive Design Layout for the WCG e-Government Website

Table 7.6: Internet Trends and WCG Actions	
Trend	Action
Mobile	The WCG launched its first mobile website in 2012 (http://m.safelyhome.westerncape.gov.za/). This was the first mobile website developed by a South African PG (according to the author's knowledge). The site was designed for basic feature phones to promote digital inclusion (Levy, 2012a).
Responsive design	Responsive design wireframes were started in 2012. The future WCG e-Government website (full Drupal website) will be developed in order to be responsive to any device. Figure 7.9 illustrates the possible responsive design layout for the WCG website on different devices.
Social media	The WCG started its first official Twitter account (@westerncapegov) in 2012 (Levy, 2012a). Social media policy, strategy and implementation guidelines development started in the last quarter of 2012.
Semantic Web	The vision of the future WCG e-Government website (full Drupal website) is for all content to be tagged and to include sufficient metadata.
Customer Relationship Management (CRM)	CRM workshops were conducted with industry in order to understand the CRM possibilities. CRM policy development started towards the end of 2012.
Transactional services	An e-Government website must evolve into a transaction website, where citizens would be able to conduct services online. This trend is included in the WCG e-Government strategy draft document (Western Cape Government, 2012d).
User generated content	The long-term vision of the WCG e-Government website is for citizens to be able to generate content such as reporting potholes or broken traffic lights. This trend is included in the WCG e-Government strategy draft document (Western Cape Government, 2012d).
Application Programme Interface (API) and open data	The e-G4C team began research into their future Web API and enabling the digital industry (Levy, 2012a). API and open data policy development started towards the end of 2012.
Use of multimedia	The content team included a multimedia specialist in the new e-G4C structure in order for more multimedia content to be created.
Open source	The new Drupal CMS for the WCG e-Government website is an open source product.

The next section summarises the results of this chapter.

7.4 Summary

Chapter 6 proposed the IUXG methodology (1.1) evaluated in this chapter. The research objective addressed in this chapter was:

RO5. Evaluate the IUXG methodology (IUXG 1.1) using the Western Cape Government as a case study.

The WCG was the South African PG identified as the case study for this research. The research question addressed in this chapter was:

RQ5. Does the IUXG methodology (IUXG 1.1) institutionalise UX in the Western Cape Government?

The first deliverable of this chapter was the results of the case study. The IUXG methodology was applied by the usability team leader (the author) in the e-G4C component in the WCG. IUXG methodology phases and steps together with WCG website projects were conducted and documented.

Phase A, startup, identified the Schaffer (2004), Nielsen (2006) and Feijo (2010) UX maturity models (Sub-section 7.3.2.1). The measured UX maturity level for the WCG before this study was: Nielsen, stage 4, *dedicated usability budget*; Schaffer, level 1, *piecemeal usability* and Feijo, level 2, *interested*. The following chapter measures the success of the IUXG methodology in terms of the increase in the UX maturity levels achieved. The UX maturity model levels, as described above, were used as a wake-up call together with the usability results of the WCG website determined by focus group results (Sub-section 7.3.1.2). An executive champion and UX consultant created buy-in for UX in the WCG.

The setup phase (B) of the IUXG methodology delivered a UX policy, strategy and guidelines for the WCG (Sub-section 7.3.2.1). The goal of the WCG is to make the UX guidelines available to all South African PGs after it is formalised. UX methods were selected for the WCG (Sub-section 7.3.2.3), including user research (focus groups, surveys), designing a website or system (wireframes and templates, Web design) and usability testing of a website or system (heuristic evaluations, usability laboratory testing). These UX methods were incorporated into the e-G4C SDLC process (Sub-section 7.3.2.5) in order to accommodate UCD. A budget was successfully set up for the UX team of the WCG (Sub-section 7.2.3.4). UX skills and knowledge training were conducted in the WCG (Sub-section 7.3.2.6).

Phase C (organisation) of the IUXG methodology helped to develop the UX team. The UX team was established as a centralised UX structure (Sub-section 7.3.3.1). The UX team developed from one staff member in 2010 to five staff members in 2012 (Sub-section 7.3.3.2). The staff members included the Usability Team Leader (UTL), Web Designer, Information Architect, contract Business Analyst (to produce wireframe templates) and User Researcher.

Phase D (method) of the IUXG methodology described the required steps to conduct a UX project. The types of sites in the WCG were identified as informational, transactional, campaign and social media (Sub-section 7.3.4.2). An e-G4C project brief document was created that served as the project proposal for new projects and assisted with project planning (Sub-sections 7.3.4.3 and 7.3.4.4). Surveys, focus groups and Google Analytics provided early, valuable user research (Sub-section 7.3.4.6). All steps of Phase D, including designing, developing, testing and refining WCG websites (Sub-section 7.3.4.7 to 7.3.4.9) were included in the updated SDLC (Appendix F).

The standards phase (E) assisted in minimising rework, enforcing consistency and taking advantage of what is already known about best practices. Wireframe and design templates were created for the WCG website (Sub-section 7.3.5.1). The first usability laboratory for a South African PG was built (Sub-section 7.3.5.2). A draft SDLC for the wider WCG (Sub-section 7.3.5.3; Appendix F), including UCD and UX activities was developed and was a deliverable of this research. The proposed SDLC is currently in a pilot project phase in the WCG.

Phase F (long-term) focused on the management and long-term considerations in order to keep UX institutionalised in government. WCG management was continuously involved through UX presentations and as stakeholders in the UX policy, strategy and guidelines document and updated SDLC project (Sub-section 7.3.6.1) to maintain the management relationship and UX awareness (Sub-section 7.3.6.2). The IUXG methodology recommends the collection of metrics to demonstrate that the UX investment is providing results. The number of visits to the WCG website improved by 1 468 422 between 2010/2011 and 2011/2012 due to UX, content and technical improvements. Latest trends, including social media, mobile and responsive design were identified and are currently in progress in the WCG (Sub-section 7.3.6.5).

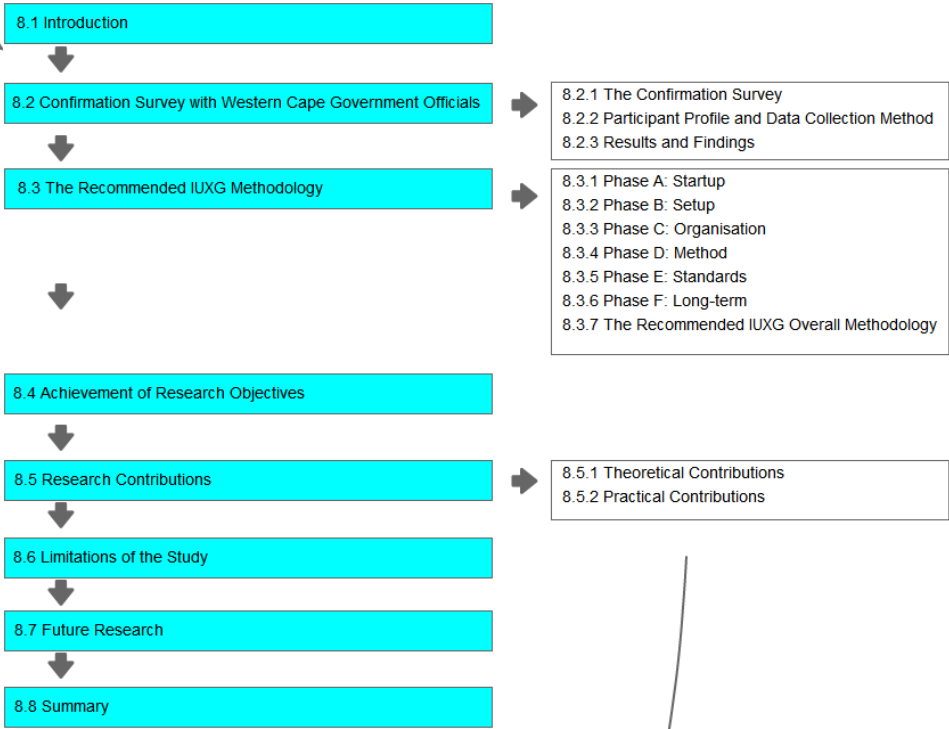
The IUXG methodology will be updated in the following chapter according to the case study results. South African Provincial Governments will be able to apply the IUXG methodology in their environments in order to institutionalise UX. (Other) South African PGs should take cognisance of the results of the WCG case study to learn lessons for their implementation of the IUXG methodology.

The results of the case study provided a second deliverable of this chapter, a gap analysis of the WCG (Appendix I). The gap analysis identified that 23 steps of the IUXG methodology were being

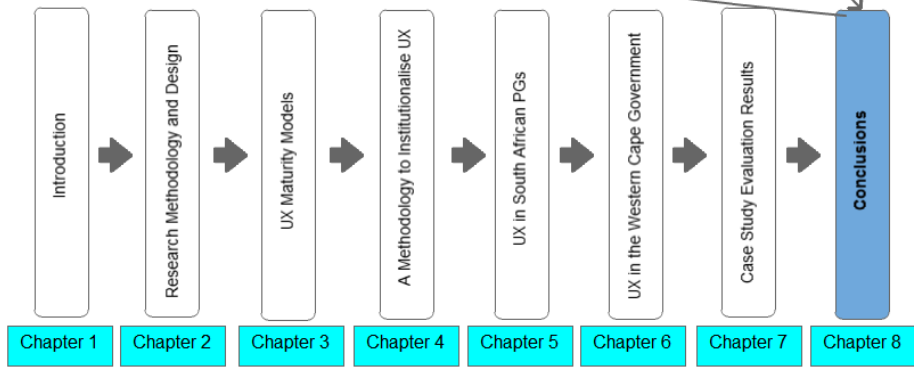
implemented successfully; 12 steps required additional work and two steps required major work. The major challenges facing the WCG to institutionalise UX include: a lack of content ownership by departments and stakeholders; a lack of development resources and an unstable, legacy CMS, currently used for the WCG e-government website.

In the following and last chapter, the IUXG methodology used in this chapter will be updated based on the results of the case study. The following chapter will also demonstrate if the UX maturity level in the WCG increased, based on a confirmation survey with WCG officials. Additionally, the research study will be summarised, future research areas identified and specific recommendations made, which were derived from the results obtained in this chapter.

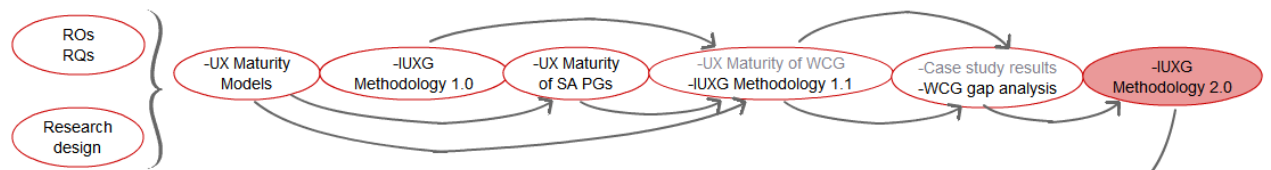
Chapter 8: Conclusions



Deliverable:
IUXG Methodology 2.0



Deliverables



A Methodology to Institutionalise User Experience in a South African Provincial Government

Chapter 8: Conclusions

8.1 Introduction

The importance of usability in e-Government has been highlighted by several studies (Bernado, 2005; Korsten and Bothma, 2005; Yeratziotis, 2008). A number of studies have listed guidelines that e-Government websites should satisfy for them to be a usable design (Bernardo, 2005; Korsten and Bothma, 2005; Yeratziotis, 2008; Mifsud, 2011). Despite the highlighted importance of usability, usability guidelines and standards, usability and user experience (UX) are rarely adopted in South African e-Government websites (Chapter 5). The Institutionalise UX in Government (IUXG) methodology was proposed (Chapter 6) to assist South African Provincial Governments (PGs) to establish UX practice as a norm: to institutionalise UX.

The IUXG methodology was implemented in a South African PG with the Western Cape Government (WCG) as the case study. Chapter 7 illustrated the results of the case study with the implementation of the six phases of the IUXG methodology: startup, setup, organisation, method, standards and long-term. A gap analysis for the WCG was identified (Appendix I), illustrating a need for content ownership by departments and stakeholders; a need for more development resources and a need to move from the old content management system (CMS) to the new CMS. The UX maturity level of the WCG, after the implementation of the IUXG methodology, will be measured in this chapter. The results will demonstrate if the implementation of the IUXG methodology was successful.

The main research objective and question of this research is addressed in this chapter:

RO_M. *To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).*

RQ_M. *Can a methodology be proposed and evaluated to institutionalise UX in a South African PG (IUXG 2.0)?*

The deliverable of this chapter is the recommended IUXG methodology (2.0). The chapter will conclude the findings of this research study. Section 8.2 discusses the results of the confirmation survey with WCG officials. This is followed by a final update of this research study of the IUXG methodology based on the results of the case study (Section 8.3). The achievement of the research objectives of the study is discussed (Section 8.4) and is followed by the theoretical and practical

contributions of this study (Section 8.5). Limitations of the study (Section 8.6) and future research (Section 8.7) are identified. Section 8.8 summarises the research study and highlights the contribution of this research to the body of knowledge.

8.2 Confirmation Survey with Western Cape Government Officials

A survey (follow-up) was conducted with WCG officials in Chapter 6 to measure the level of UX maturity before this research study commenced. UX maturity models allow an assessment of the degree of capability reached by an organisation and its ability to perform UX activities (Earthy, 1999). The goal of this section is to conduct a confirmation survey with the identical group of WCG officials to examine the level of UX maturity in the WCG after the implementation of the IUXG methodology (Chapter 7). The survey details, participant profile, data collection method, data results and findings are discussed next.

8.2.1 The Confirmation Survey

The goal of the confirmation survey is to analyse the maturity level of UX in the WCG after the implementation of the IUXG methodology. The confirmation survey consisted of:

- *Schaffer's (2004) maturity model* (Discussed in Chapter 3, Section 3.4);
- *Nielsen's (2006) maturity model* (Discussed in Chapter 3, Section 3.4);
- *Feijo's (2010) maturity model* (Discussed in Chapter 3, Section 3.4);
- *UX Generic questions categorised into the IUXG methodology (Chapter 6) main steps*: The questions are selected from the questions listed in the follow-up survey. The full list of questions from the confirmation survey is not included as the purpose of the confirmation survey is to compare the before and after situation. The follow-up survey had questions that informed the development of the IUXG methodology; these questions are not included in the confirmation survey.

8.2.2 Participant Profile and Data Collection Method

The participant profile of the confirmation survey was identical to the participant profile of the follow-up survey (Chapter 6). The participants included:

- *Director*: The Director manages the e-G4C Directorate and is responsible for the WCG Internet websites;

- *Technical Team Leader*: The Technical Team Leader manages the development of the WCG Internet websites;
- *Internet Programme Manager*: The Internet Programme Manager manages the approval and development of citizen-facing websites and online presences for the WCG;
- *Managing Editor*: The Managing Editor is overall responsible for ensuring high-quality online content produced by the WCG;
- *Project Manager*: The Project Manager is an external consultant and project manager of WCG Internet website projects.

Data collection commenced with the same procedure as in the follow-up survey. Each official was approached in person and informed of the confirmation survey and the need for it. The confirmation survey was conducted by means of a personal interview with each WCG official. The data analysis of the confirmation survey was completed by grouping results into categories. The categories of the proposed IUXG methodology were used. Patterns and relationships were identified in the data to reach conclusions. The data is presented in a narrative summary (Table 8.1). The next sub-section describes the results and findings of the confirmation survey.

8.2.3 Results and Findings

The results of the confirmation survey are listed in Table 8.1 (participants indicated by “n”). The table provides the results for:

- 2009-2010: The timeline before the institutionalisation exercise had started. The Usability Team Leader joined the website team in July 2010. One participant did not comment on 2009-2010 as the participant had not yet joined the WCG at that time;
- 2012: The confirmation survey results are included in the 2012 column. The improvements from 2009-2010 to 2012 are discussed after Table 8.1.

Table 8.1: Confirmation Survey Results for the WCG			
Questions		2009-2010 Results (Chapter 6)	2012 Results
1.	Nielsen MM (Stage 1 – 8)	Stage 1: n=1; Stage 2: n=1; Stage 4: n=2; N/A: n=1; UTL: Stage 4.	Stage 5: n=2 (participants stated that there were elements of stage 6); Stage 6: n=3; UTL: Stage 6.

Table 8.1: Confirmation Survey Results for the WCG			
Questions		2009-2010 Results (Chapter 6)	2012 Results
2.	Schaffer MM (Level 0 – 5)	Level 0: n=2; Level 1: n=1; Level 2: n=1; N/A: n=1; UTL: Level 1.	Level 2: n=2 (participants noted that level 3 foundation work were in place); Level 3: n=2; Level 4: n=1; UTL: Level 3.
3.	Feijo MM (Level 1 – 6)	Level 1: n=1; Level 2: n=3; N/A: n=1; UTL: Level 2.	Level 3: n=2; Level 4: n=3; UTL: Level 3 (starting to reach level 4).
STARTUP			
4.	Do you have executive support?	Yes: n=2; No: n=1; N/A: n=2.	Yes: n=5.
5.	Are usability and UX Design recognised as unique and valued skills?	Yes: n=4; (emerging awareness) N/A: n=1.	Yes: n=5.
SETUP			
6.	Do you have a usability/UX policy, strategy and guidelines?	No: n=4; N/A: n=1.	Yes: n=5.
7.	Are usability and UX a part of your development lifecycle (website)?	Yes: n=2 (started); No: n=1; N/A: n=2.	Yes: n=5.
8.	Are usability and UX exposure / training available to UX employees?	Yes: n=1; No: n=2; N/A: n=2.	Yes: n=5.
9.	Are usability and UX exposure / training available to other employees?	Yes: n=1; No: n=2; N/A: n=2.	Yes: n=5.
10.	Are UX methods used?	Yes: n=2 (started); No: n=1 (not formally); N/A: n=2.	Yes: n=5.
ORGANISATION			
11.	Do you have usability and UX employees in your organisation?	No: n=3 (However, Usability Team Leader arrived in mid-2010); N/A: n=2.	Yes: n=5.
METHOD			
12.	Is user research conducted?	Yes: n=2; (not all stakeholders; need improvement) No: n=1; N/A: n=2.	Yes: n=5.

Table 8.1: Confirmation Survey Results for the WCG			
Questions		2009-2010 Results (Chapter 6)	2012 Results
STANDARDS			
13.	Do you make use of templates?	No: n=3; N/A: n=2.	Yes: n=5.
14.	Do you have a usability testing facility?	No: n=3; N/A: n=2.	Yes: n=5.
15.	Is UCD a standard?	No: n=3; N/A: n=2.	Yes: n=5 (in e-G4C).
16.	Do you follow UX best practices and guidelines?	No: n=2; N/A: n=3.	Yes: n=5.
LONG-TERM			
No questions from the long-term section were carried through to the confirmation survey.			

The improvements of the UX maturity levels after the implementation of the IUXG methodology were as follows:

- Nielsen:
 - 2009-2010 Lowest rating: **stage 1**; 2012 Lowest rating: **stage 5**;
 - 2009-2010 Highest rating: **stage 4**; 2012 Highest rating: **stage 6**;
 - 2009-2010 UTL rating: **stage 4**; 2012 UTL rating: **stage 6**;
 - All participants, including the UTL, rated an improvement of maturity on the Nielsen maturity model;
- Schaffer:
 - 2009-2010 Lowest rating: **level 0**; 2012 Lowest rating: **level 2**;
 - 2009-2010 Highest rating: **level 2**; 2012 Highest rating: **level 4**;
 - 2009-2010 UTL rating: **level 1**; 2012 UTL rating: **level 3**;
 - All participants, including the UTL, rated an improvement of maturity on the Schaffer maturity model;
- Feijo:
 - 2009-2010 Lowest rating: **level 1**; 2012 Lowest rating: **level 3**;
 - 2009-2010 Highest rating: **level 2**; 2012 Highest rating: **level 4**;
 - 2009-2010 UTL rating: **level 2**; 2012 UTL rating: **level 3** (starting to see level 4);
 - All participants, including the UTL, rated an improvement of maturity on the Feijo maturity model.

All participants indicated an improvement on all UX maturity models of UX maturity after the implementation of the IUXG methodology. The 2012 confirmation survey results, as happened with the 2009 to 2010 follow-up survey results (Chapter 6) showed that participants do not all agree on the level of usability maturity. The UTL (UX consultant) score is therefore also listed, as recommended by the IUXG methodology.

Additionally, participants' comments regarding the usability and UX maturity status included:

- Nielsen maturity model: *“More early user research is required”*. The statement illustrates how participants are becoming aware of the need for UX;
- Schaffer maturity model: *“In order to move to level 4 we need more resources”*. Level 4 requires sufficient staff to handle the full set of projects executed by the WCG;
- Feijo maturity model: *“It will be difficult to obtain level 5 as decisions and timeframes can be politically motivated”*. A possible solution to address this comment is to achieve buy-in (IUXG methodology step A7: Obtain buy-in) in higher and political levels of government;
- *“The wider WCG needs to follow the SDLC as well”*. The next step for the researcher (outside of the scope of this study) is to impose the adoption of the new SDLC in the wider WCG in order for non-e-Government systems to be included.

The comparison between the follow-up survey and the confirmation survey results demonstrated the following important improvements after the implementation of the IUXG methodology (from Table 8.1):

- UX activities and UCD are part of the SDLC and are used and standard in e-G4C;
- The UX policy, strategy and guidelines document was approved by the Centre Top Management members and will apply to the wider WCG. The document allows for UX best practices to be followed;
- The UX team started with one staff member and now has five;
- UX training is available to UX and non-UX e-G4C employees;
- UX methods are used and user research is conducted;
- Templates are used for wireframes, design and usability testing projects;
- A usability testing facility, the first for a South African PG, was established.

Institutionalising UX provides tools, methods and resources, including staff (Israelski, 2004). The confirmation survey illustrated that the implementation of the IUXG methodology institutionalised

UX in the WCG. The next section updates the IUXG methodology according to the case study results (Chapter 7).

8.3 The Recommended IUXG Methodology

The goal of this section is to update the IUXG methodology, where applicable, based on the case study results provided in Chapter 7. The IUXG methodology has the following six main phases:

- Phase A: Startup: start the UX initiative;
- Phase B: Setup: establish the infrastructure;
- Phase C: Organisation: develop the UX team;
- Phase D: Method: the required steps for conducting a UX project;
- Phase E: Standards: minimise rework and enforce consistency;
- Phase F: Long-term: long-term considerations in order to keep UX institutionalised in government.

Sub-section 8.3.7 provides the recommended overall IUXG methodology. Figure 8.7, uses the information from Sub-section 8.2.1 to Sub-section 8.2.6 to provide the final, updated IUXG methodology (2.0) for this research study.

8.3.1 Phase A: Startup

Phase A, Startup, did not require any updates to the IUXG methodology. Figure 8.1 illustrates the recommended Phase A, startup, for this research study.

8.3.2 Phase B: Setup

Phase B, Setup, required one update for the step *B4: Setup budget and procurement*. “*Consult supply chain management*” and “*understand procurement delegations*” were added to “*understand the procurement process*”. Figure 8.2 illustrates the recommended Phase B, setup, for this research study.

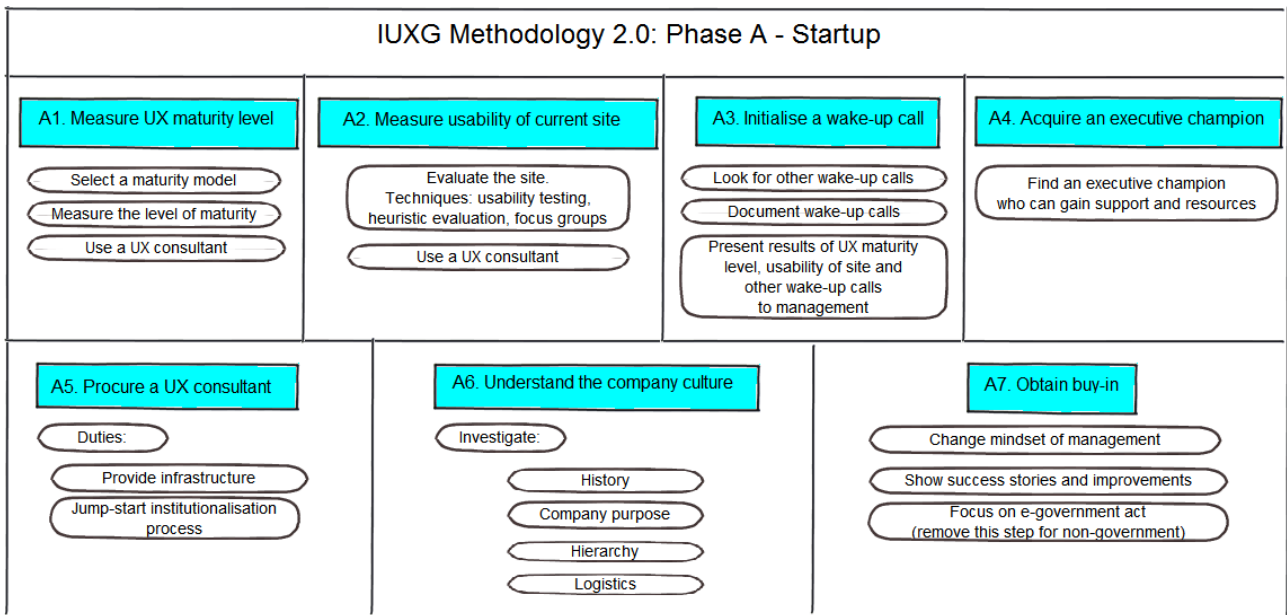


Figure 8.1: IUXG Methodology 2.0: Phase A - Startup

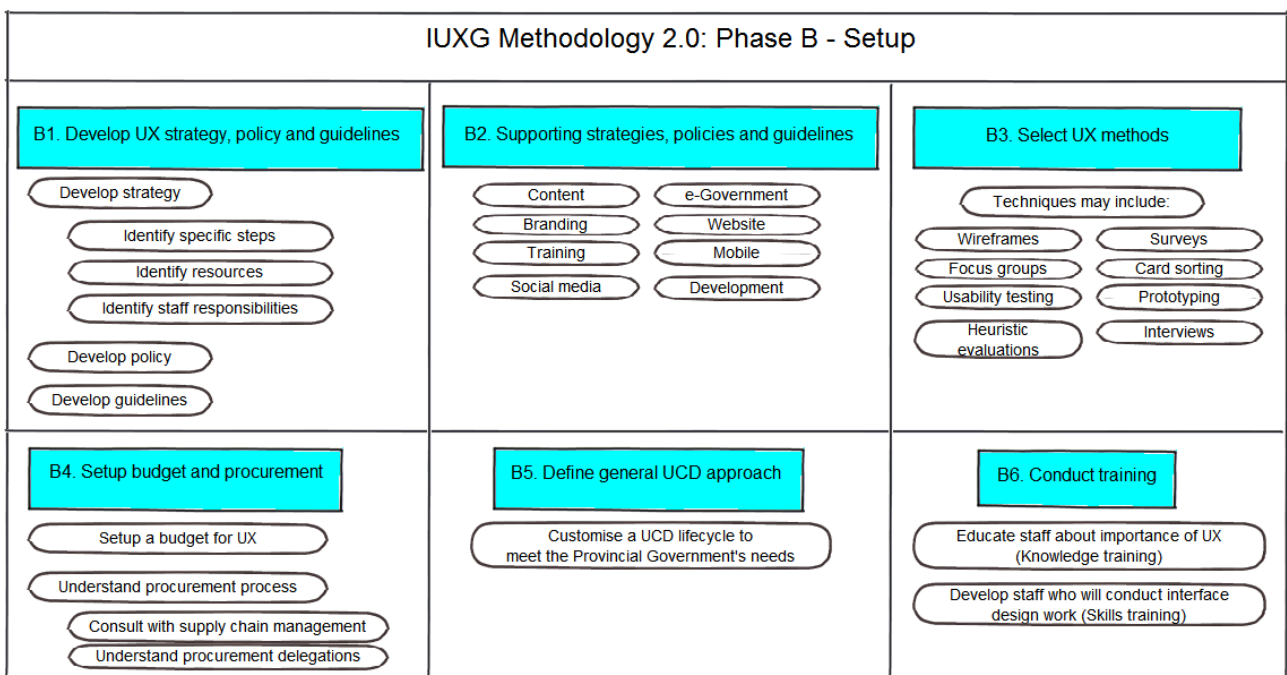


Figure 8.2: IUXG Methodology 2.0: Phase B – Setup

8.3.3 Phase C: Organisation

The roles of the UX staff in Phase C, Organisation (C2: Define and recruit UX staff) were updated to include the UX roles identified in the case study results (Chapter 7, Sub-section 7.3.2.2). The updated UX roles included: UX Manager; Information Architect; User Researcher; Usability

Engineer; Senior Web Designer; Web Designer and UX Designer. Figure 8.3 illustrates the recommended Phase C, organisation, for this research study.

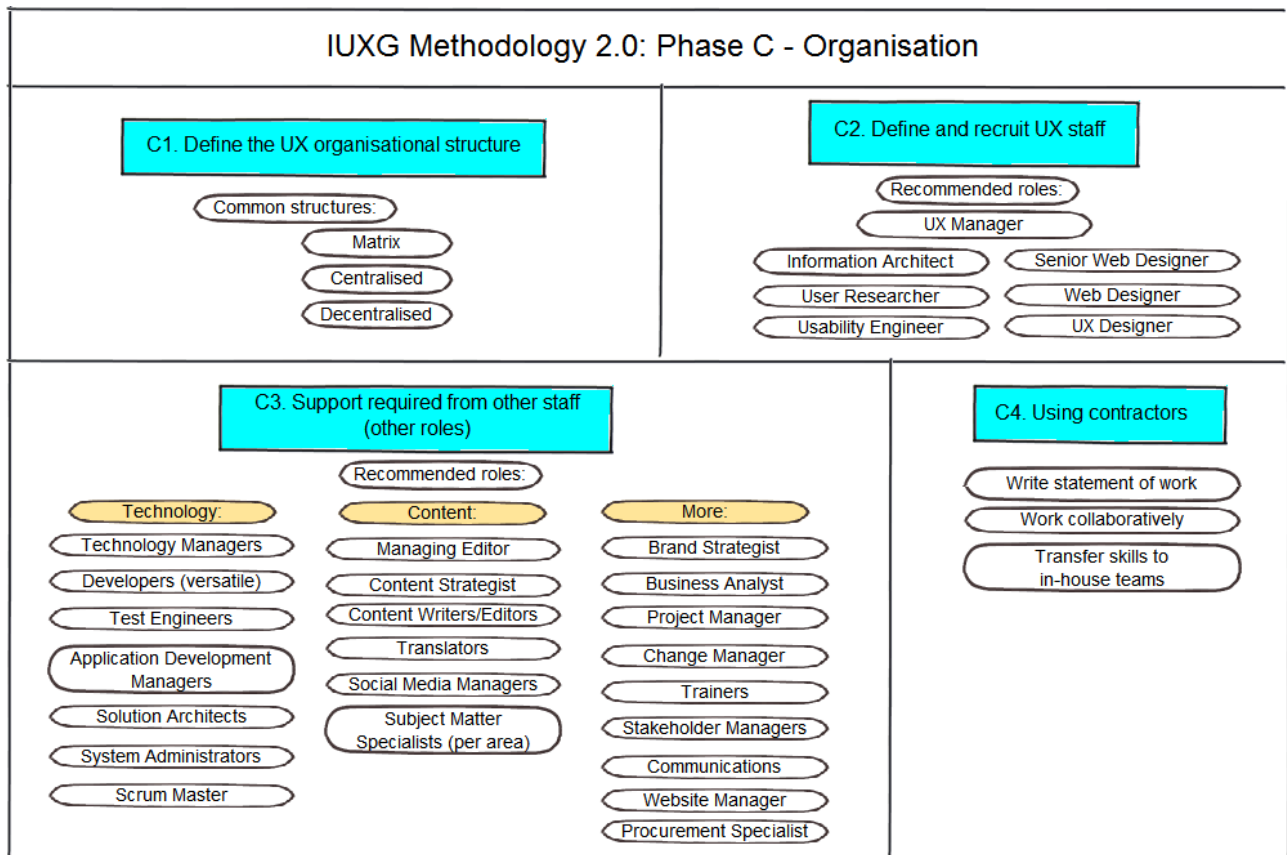


Figure 8.3: IUXG Methodology 2.0: Phase C - Organisation

8.3.4 Phase D: Method

The following updates were made to Phase D, Method:

- Update step: *D2. Identify the type of site:*
 - The case study results identified four typical types of pages in the WCG: informational; transactional; campaign and social media;
- Update step: *D7. Design the site:*
 - Chapter 7 noted that the implementation of the WCG corporate brand should be added to this step of the IUXG methodology;
 - The creation and registration of “.gov” domain names was recommended from the results in Chapter 7.

Figure 8.4 illustrates the recommended Phase D, method, for this research study.

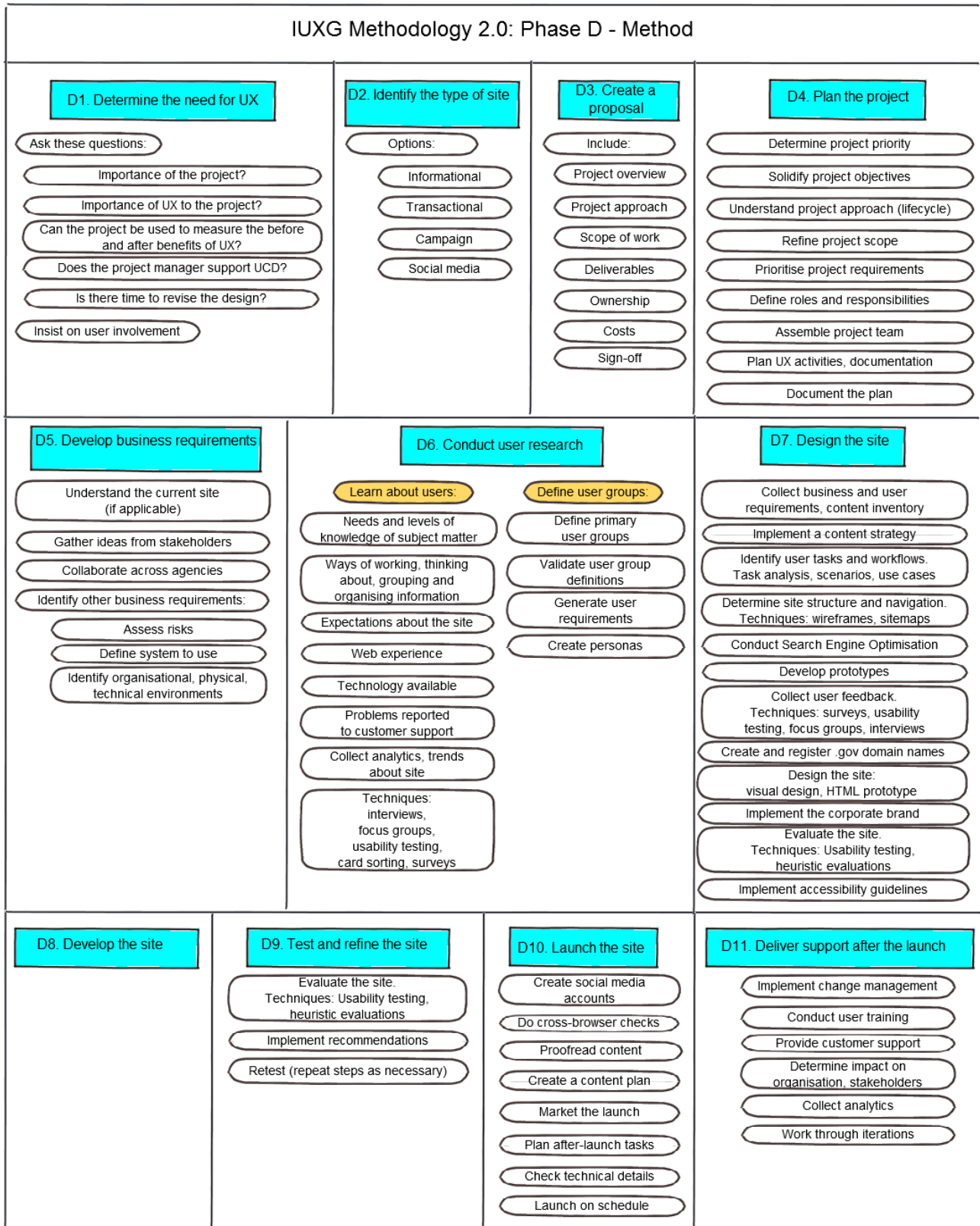


Figure 8.4: IUXG Methodology 2.0: Phase D - Method

8.3.5 Phase E: Standards

Phase E, Standards, did not require any updates to the IUXG methodology. Figure 8.5 illustrates the recommended Phase E, standards, for this research study.

8.3.6 Phase F: Long-term

Phase F, Long-term was updated to include a new step to conduct on-going measurements of the level of UX maturity in the PG. The level of UX maturity in the WCG was measured three times during this research study: before the IUXG methodology was implemented; during implementation (not reported in this research study) and towards the end of this research study. The continuous measurement of UX maturity will assist the UX team to understand the current situation and to determine what still needs to be achieved.

Additionally, the “*maintain respect*” and “*maintain momentum*” sub-steps were combined as recommended in the results chapter. Figure 8.6 illustrates the recommended Phase F, *long-term*, for this research study.

8.3.7 The Recommended IUXG Overall Methodology

Figure 8.7 uses the information from Sub-section 8.2.1 to Sub-section 8.2.6 to provide the final updated IUXG methodology (2.0) for this research study. The IUXG methodology is the deliverable of this chapter and answers RQ_M (discussed in the next section). Figure 8.1 to Figure 8.6 provided more detailed sub-steps for each of the main steps. Figure 8.7 provides the recommended main phases of the IUXG methodology, as well as the next high-level steps.

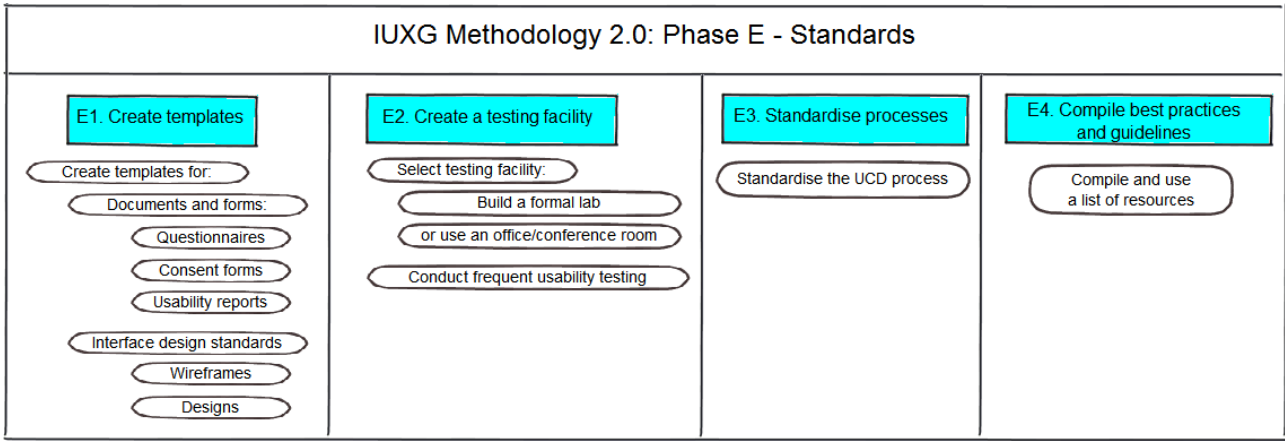


Figure 8.5: IUXG Methodology 2.0: Phase E - Standards

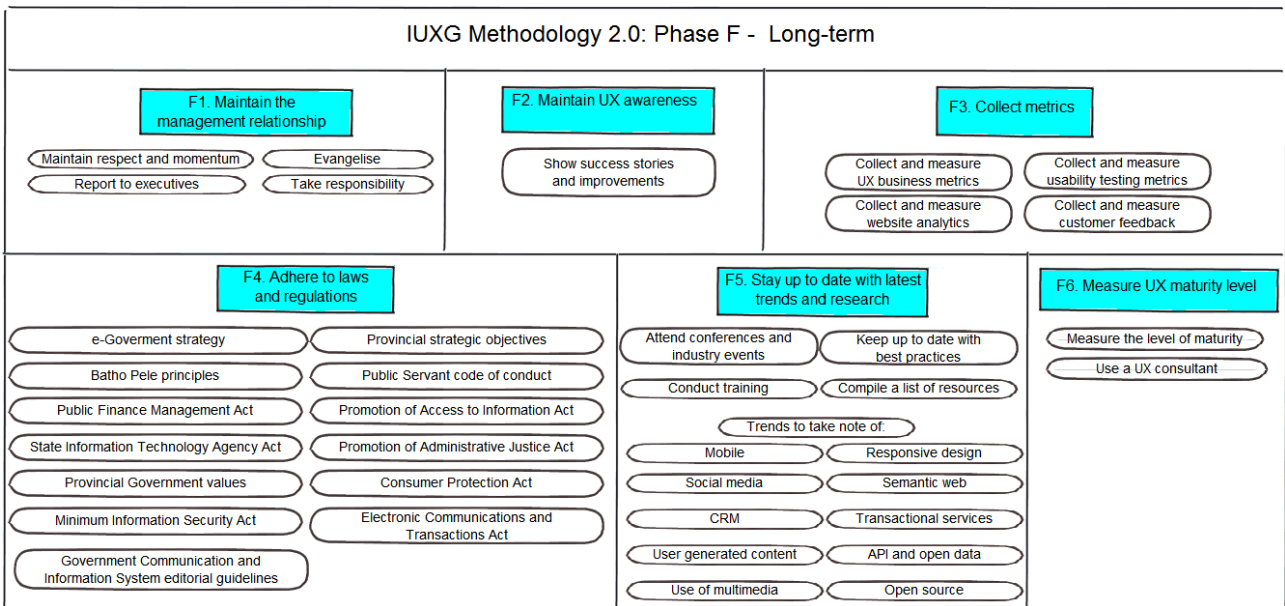


Figure 8.6: IUXG Methodology 2.0: Phase F - Long-term

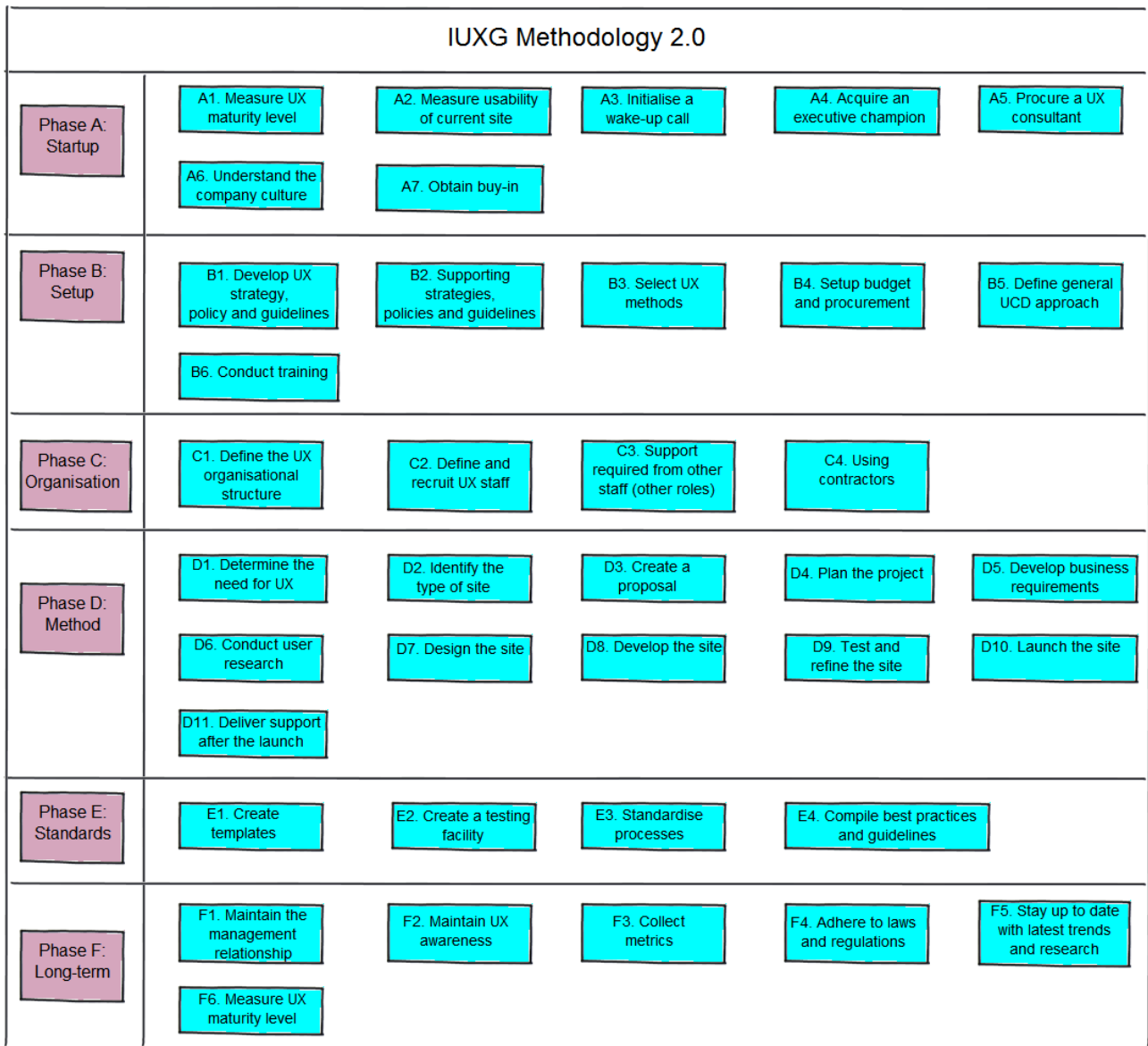


Figure 8.7: IUXG Methodology 2.0

8.4 Achievement of Research Objectives

Table 8.2 lists the research objectives and questions identified in Section 1.5 in Chapter 1. The research objectives were successfully achieved and all research questions successfully answered by means of empirical evaluation. RO1 and RQ1 were achieved by identifying UX maturity models (Chapter 3) used in the survey for South African PG (Chapter 5).

RO2, RQ2a and RQ2b were achieved with the proposal of an initial IUXG methodology (1.0) based on existing literature (Chapter 4). RO3 and RQ3 were achieved by means of a survey, administered to South African PG officials, to determine the UX maturity of South African PGs. The maturity model results indicated that UX are not yet mature in South African PGs. The majority of PGs were

rated below average in the maturity models. The PG with the highest rating in each model had at least three levels of progress before reaching the highest level of each maturity model.

Table 8.2: Research Objectives and Questions			
Research Objectives		Research Questions	
RO_M	To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).	RQ_M	Can a methodology be proposed and evaluated to institutionalise UX in a South African PG (IUXG 2.0)?
RO1	Recommend UX maturity model(s).	RQ1	What UX maturity model(s) can be identified from literature?
RO2	Propose a methodology for the institutionalisation of UX (IUXG 1.0).	RQ2a	What current UX methodologies can be identified from literature?
		RQ2b	What integrated methodology can be proposed to institutionalise UX (IUXG 1.0)?
RO3	Evaluate the maturity model level of UX in South African PGs.	RQ3	What is the maturity model level of UX in South African PGs?
RO4a	Re-evaluate the maturity model level of UX in the WCG.	RQ4a	What is the current maturity model level of UX in the WCG?
RO4b	Propose an updated methodology to institutionalise UX in a South African PG (IUXG 1.1).	RQ4b	What updated methodology should be proposed to institutionalise UX in a South African PG (IUXG 1.1)?
RO5	Evaluate the IUXG methodology (IUXG 1.1) using the Western Cape Government as a case study.	RQ5	Does the IUXG methodology (IUXG 1.1) institutionalise UX in the Western Cape Government?

RO4a and RQ4a were achieved through a survey (the follow-up survey) of the UX maturity level of the WCG, the case study selected from South African PGs. Key WCG officials were identified and approached to complete the survey. The maturity model results showed that the WCG was at a low level of maturity between 2009 and 2010 (Chapter 6). In the WCG, there was no UX strategy; there was a lack of understanding of UX and also a lack of UX staff and leadership.

RO4b and RQ4b were achieved by updating the IUXG methodology (1.1) based on WCG literature, the survey with South African PGs and the follow-up survey results (Chapter 6). RO5 and RQ5 were achieved by applying the IUXG methodology (1.1) in the e-G4C directorate of the WCG (the case study). The results of the case study (Chapter 7) provided a gap analysis for the WCG (Appendix I) and also allowed for the IUXG methodology to be updated.

A confirmation survey to measure the UX maturity of the WCG was administered to the same participant group who completed the follow-up survey. All participants indicated an improvement

on all UX maturity models of UX maturity after the implementation of the IUXG methodology. RO_M and RQ_M were achieved by updating the successfully measured IUXG methodology (2.0) based on the case study results. The thesis statement of this research study was: *A methodology for institutionalising UX in a South African Provincial Government can enhance the UX maturity of a Provincial Government*. The achievement of RO_M and RQ_M and RO5 proved that the thesis statement can be confirmed.

Table 8.3 summarises the discussion above by illustrating: the achievement of the research objectives and questions; the corresponding chapters and the deliverables for each research objective and research question. The next section discusses the research contributions of this study.

Table 8.3: Achievement of Research Objectives					
Research Objectives	Research Objective Achieved?	Research Questions	Research Questions Answered?	Thesis Chapters	Chapter Deliverables
RO1	Yes	RQ1	Yes	Chapter 3	UX maturity models for the PG survey: <ul style="list-style-type: none"> Nielsen (2006), Schaffer (2004) and Feijo (2010).
RO2	Yes	RQ2a, RQ2b	Yes	Chapter 4	IUXG Methodology for the institutionalisation of UX: <ul style="list-style-type: none"> IUXG methodology 1.0.
RO3	Yes	RQ3	Yes	Chapter 5	Survey results of the UX maturity level of South African PGs: <ul style="list-style-type: none"> Available from Chapter 5: Figure 5.7; Figure 5.8 and Figure 5.9.
RO4a	Yes	RQ4a	Yes	Chapter 6	Follow-up survey results of the UX maturity level of the selected South African PG – the WCG: <ul style="list-style-type: none"> UTL ratings: <ul style="list-style-type: none"> Nielsen: stage 4; Schaffer: level 1; Feijo: level 2; Participant ratings available from Chapter 6, Table 6.1.
RO4b	Yes	RQ4b	Yes	Chapter 6	Updated IUXG Methodology for the institutionalisation of UX in a South African PG: <ul style="list-style-type: none"> IUXG methodology 1.1.
RO5	Yes	RQ5	Yes	Chapter 7	Results of the case study: Available from Chapter 7, Section 7.3; Gap analysis for the WCG: <ul style="list-style-type: none"> Available from Appendix I; Major challenges for the WCG included a lack of content ownership by departments and stakeholders; a lack of development resources and an unstable legacy CMS currently used for the WCG e-government website.
RO _m	Yes	RQ _m	Yes	Chapter 8	Confirmation survey results of the UX maturity level of the WCG after the study: <ul style="list-style-type: none"> UTL ratings: <ul style="list-style-type: none"> Nielsen: stage 6; Schaffer: level 3; Feijo: level 3 (with elements of level 4); Participant ratings available from Chapter 8, Table 8.1. Updated IUXG methodology for the institutionalisation of UX in a South African PG: <ul style="list-style-type: none"> IUXG methodology 2.0.

8.5 Research Contributions

Several significant contributions are made to the UX and e-Government fields in South Africa. Additionally, the findings of the research can be applied by governments of emerging economies. The contributions of this research can be categorised as theoretical contributions (Sub-section 8.5.1) as well as practical contributions (Sub-section 8.5.2).

8.5.1 Theoretical Contributions

Buie and Murray (2012) published a book in 2012 entitled “*Usability in Government Systems*”. They state that the book is the first that concentrates on the role of usability in government systems. The research conducted in this study, is the first research to propose and evaluate a methodology to institutionalise UX in a South African Provincial Government (PG).

Several studies have highlighted the importance of usability in e-Government (Bernado, 2005; Korsten and Bothma, 2005; Yeratziotis, 2008). Many of these studies have listed guidelines that e-Government websites should satisfy for them to be usable (Bernardo, 2005; Korsten and Bothma, 2005; Yeratziotis, 2008; Mifsud, 2011); however, their effectiveness depends extensively on the profiles of the individuals in a team and on an organisation’s understanding of UX (Jorge, 2012). Despite the highlighted importance of usability and the usability guidelines and standards, usability and UX are rarely adopted in South African e-Government websites. The research study indicated that there is a lack of understanding and buy-in of UX at South African PG level (Chapter 5).

Methodologies to institutionalise UX (ranging in detail) exist (Schaffer, 2004; ISO TR 18529, 2000; Unger and Chandler, 2009; Staggers et al., 2011; Usability.gov, 2012c); however, these UX methodologies are not aimed specifically at South African Provincial Governments. The objective of this research study was to propose and evaluate a methodology to institutionalise UX in South African PGs, named the Institutionalise UX in Government (IUXG) methodology. The initial, proposed IUXG methodology (1.0) was designed from five UX methodologies found in literature (Schaffer, 2004; ISO TR 18529, 2000; Unger and Chandler, 2009; Staggers et al., 2011; Usability.gov, 2012c), as well as best practices found in literature (Chapter 3).

The IUXG methodology (1.1) was updated, based on results of the survey to South African PGs (Chapter 5), a survey to WCG employees (Chapter 6), as well as literature from the WCG (Chapter 6). The IUXG methodology (2.0) was updated a final time based on the case study results (Chapter

7) and on a confirmation survey with WCG employees (Chapter 8) after the implementation of the case study.

The research study demonstrated that the UX maturity levels of South African PGs are low (Chapter 5). An organisation with a low maturity rating is unlikely to be able to conceive of the processes necessary to bring about the highest levels of UX maturity (Earthy, 1998). The advantage of the IUXG methodology is that it provides PG officials with a step-by-step method on how to institutionalise UX in a PG.

The six phases of the IUXG methodology, startup, setup, organisation, method, standards and long-term, will assist PG officials to obtain increased UX maturity levels, as was evaluated in the WCG case study. The recommended IUXG methodology was provided in Section 8.3. The IUXG methodology will assist South African PGs to establish UX practice as a norm. The IUXG methodology will empower PGs with the resources, methods and tools to be able to implement UX guidelines. The result will be a more user-centric PG e-Government website.

Institutionalising UX provides tools, methods, resources and staff (Israelski, 2004). The IUXG methodology was applied in a case study in the Western Cape Government (WCG). The results of the case study will allow other PGs to observe the challenges and lessons learnt from this UX institutionalisation project. A gap analysis (Appendix I) was produced for the WCG based on the case study results. The gap analysis can be used as a template by PGs to conduct a gap analysis before and after the implementation of the IUXG methodology.

Three UX maturity models were identified in this research: Schaffer (2004), Nielsen (2006) and Feijo (2010) (Chapter 3, Sub-section 3.4.1). UX maturity models allow the assessment of the degree of capability reached by an organisation and its ability to perform UX activities (Earthy, 1999). PGs will be able to use the three maturity models to identify their level of UX maturity.

Surveys were created (Appendix C; Chapter 6; Chapter 8), incorporating the identified UX maturity models, as well as related UX questions (Straub et al., 2009; Human Factors International, 2011; Ide-Smith, 2011b). PGs will be able to use these surveys to identify areas of improvement that can be provided with additional attention during the implementation of the IUXG methodology.

Previous South African Government studies (Korsten and Bothma, 2005; Bernardo, 2005; Yeratziotis, 2008) did not investigate the institutionalisation of UX, such as, UX awareness, buy-in, user-centred design methods, staff, etc. Further, most previous studies focused on the National Government and specifically on the www.gov.za website. This study focused on a PG level. Further, the fact that the IUXG methodology was implemented in a live South African PG environment (the WCG), and thus generated real-world results, makes this study unique. The practical contributions are discussed next.

8.5.2 Practical Contributions

This research study has made the following practical research contributions in the WCG and e-G4C:

- UX methods, including focus groups, surveys, wireframes, Web design, templates, usability laboratory testing and heuristic evaluations are standard practice for the WCG e-Government website (Pretorius, 2012h);
- UCD is part of the SDLC used by e-G4C for the WCG e-Government website (Pretorius, 2012c);
- The SDLC used by e-G4C has been proposed for the wider WCG (to be used for systems, not part of the e-Government website) and is in a consultation and pilot phase (Pretorius, 2012c);
- A UX policy, strategy and guidelines document (Pretorius, 2012h) has been recommended and was approved by Centre Top Management members. The document will apply to the wider WCG, including the WCG e-Government website and other WCG websites and systems;
- The UX maturity level of the WCG was measured three times throughout this research study. The WCG has improved on all identified UX maturity models due to the implementation of the IUXG methodology (Section 8.2);
- A gap analysis for the WCG was produced (Appendix I), illustrating the current situation (after the research study) of the WCG, including challenges and remaining objectives;
- Base templates for wireframes, design and usability testing projects were created;
- The author of this research was the only UX employee at the start of this research study. The UX team consisted of five staff members at the conclusion of this research study;
- Improvements to the WCG e-Government website were made through recommendations from focus groups, usability testing and heuristic evaluations and by applying UX methods such as wireframing and Web design. Figure 8.8 illustrates the difference between the

homepage at the start of this study (left-side of Figure 8.8) and the current website (right-side of Figure 8.8). The major changes to the website included: a top story carousel for the home page to have more frequent and new stories; mega drop-down menus to improve navigation; senseless icons were replaced by photos with meaning; department and ministry stakeholder information moved above the fold of the page and was displayed in a clearer fashion; the application of the new WCG branding and several elements were renamed to be more comprehensible;

- The result of UX, content and technical improvements was that more citizens used the WCG e-Government website. The number of unique visitors increased from 1 829 930 in 2010/2011 to 3 019 828 in 2011/2012. The number of unique visitors for the 2012/2013 period (1 April 2012 to 14 November 2012, with more than four months remaining), was 2 359 095 (Google Analytics, 2012), more than the number for the full 2010/2011 year;
- A usability testing facility was constructed and is the first usability testing facility for a South African PG.

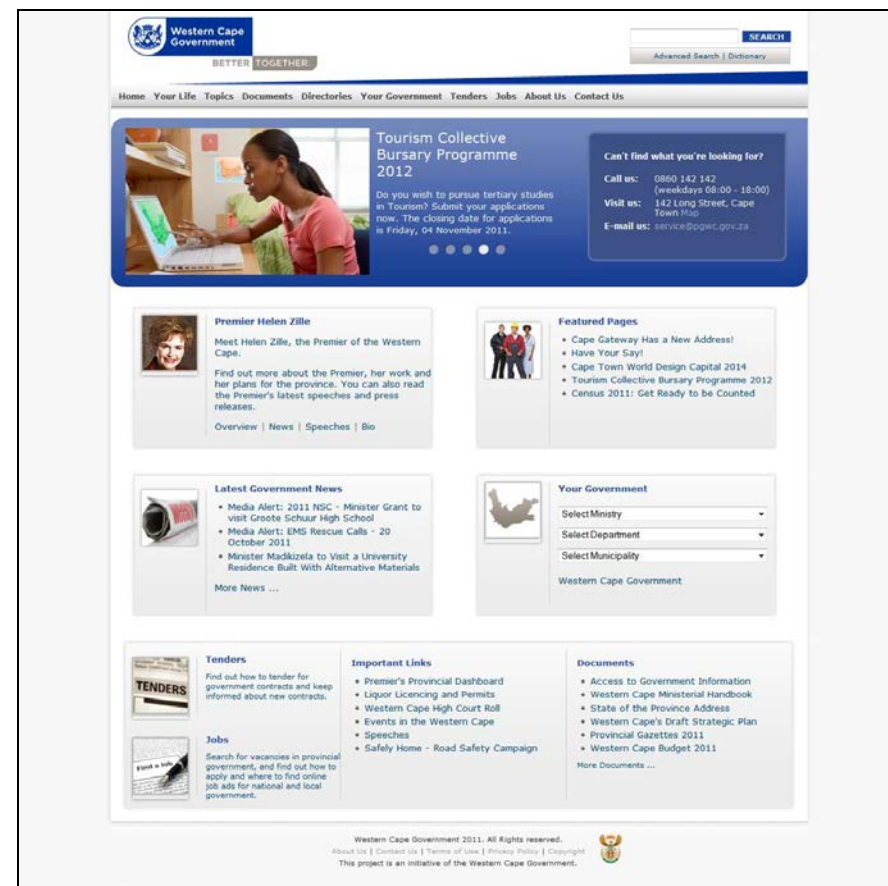
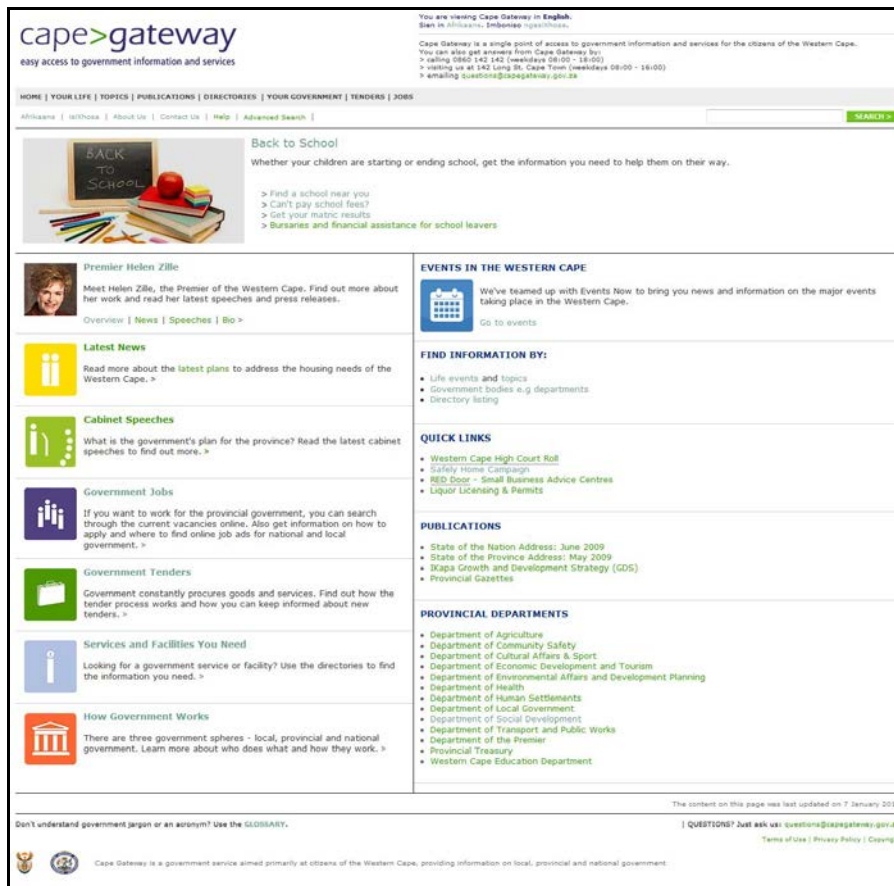


Figure 8.8: WCG Website Before (Left) and After (Right) the Research Study

Several practical contributions to the WCG are listed above. Additionally, the WCG e-Government website received the following press coverage during the research study:

- Van Onselen (2012a: 1) conducted research on annual reports for PGs on South African PG websites and reported the following on Politicsweb (www.politicsweb.co.za):
 - *“The only province without a report missing or website broken, and where every annual report could be found in an easily downloadable form was, you guessed it, the Western Cape”*;
 - *“50 (58%) of the 86 ANC provincial departments did not have their reports available. Of the 36 that did, in the overwhelming majority of cases, the files were so poorly formatted and of such size (I had to download some in excess of 140MB) that it is fair to say no one without high-speed broadband would be able to access them. In contrast, all 12 Western Cape departmental reports are easily available both on the respective websites and in a central repository”*;
- Van Onselen (2012b: 1) conducted a follow-up study towards the end of 2012 and reported the following (Die Burger, 2012; Van Onselen, 2012b: 1):
 - *“As in April (2012), the only exception was the DA-run Western Cape Government. Its websites not only worked perfectly but were the most user-friendly. That tells you much about the attitude of those governments to transparency and accountability; for access to government information is your right”*;
 - *“Western Cape – the only province where every single provincial department had a perfectly functioning website”*;
 - *“On all these grounds, the Western Cape Provincial websites stand alone – up to date, user friendly, cleanly and consistently branded – in short, basically just professional”*.

The press coverage, listed above, acknowledges the WCG e-Government website as a “*user friendly*” website. The next section discusses the limitations of the study.

8.6 Limitations of the Study

A limitation of the research study was that only a single case study was conducted and only in South Africa. Case studies are by their nature a time consuming process and require substantial time commitments from researchers and the participants (Lazar, Feng and Hochheiser, 2010). The case study for this research study reached almost three years in duration; hence, more than one case

study was not possible for this research study. The research needs to be further expanded to include additional South African case studies, as well as to include South African local and national governments and international, emerging economies.

Despite the broad-based acceptance of survey research, there remains a doubt concerning the reliability of information derived from a relatively small number of respondents who purported to represent the whole (Rea and Parker, 2005). Nine respondents from South African PGs participated in the first survey. There are, however, only nine PGs in South Africa and many website teams consist of small teams (Levy, 2012c). Five WCG officials participated in the second (follow-up) and third (confirmation) surveys. There were, however, only five WCG officials available to answer the survey questions. The WCG, most likely, has the largest e-Government website team currently in South African PGs; therefore it would be challenging to find more South African PG officials for other case study options. An international case study may be required to repeat the case study with more PG officials.

8.7 Future Research

The previous section listed the single case study as a limitation of this research study. Future research includes the application of the IUXG methodology to other PGs in South Africa. Additionally, the application of the IUXG methodology to South African local and national government levels, as well as to international emerging economy governments, is identified as future research. The previous section identified the number of participating PG officials as a limitation. Future research should include additional PG officials for the completion of the surveys.

Future research includes the application of the IUXG methodology in the wider WCG so that UX is applicable not only to the e-Government website, but also to other WCG systems, such as the employee performance, evaluation system. The proposed SDLC (Appendix F) is currently in a pilot phase for the wider WCG. Additionally, The IUXG methodology needs to be expanded to include other citizen facing channels such as the contact centre.

Chapter 3 listed Morville's (2004) UX qualities including: useful, usable, desirable, findable, accessible, credible and valuable. Future research includes the incorporation of Morville's UX qualities (2004) in the method phase of the IUXG methodology. The IUXG methodology can be adopted to be applicable in non-government areas such as the banking and e-Commerce industries.

The customisation of the IUXG methodology to other industry sectors is identified as future research.

The focus of this research was on UX. The IUXG methodology focuses on the institutionalisation of UX, but it can also assist in setting up the e-Government website environment. The research study assumed that a PG already has an established general organisational structure to support a website, such as staff (owner/manager; developers; etc.). The IUXG methodology can be expanded, especially in the startup, setup and organisation phase to institutionalise an e-Government website team. Additionally, future research can build on the non-UX steps in the method phase, such as business requirements and development. The next section summarises the research study.

8.8 Summary

The problem researched in this study was that UX processes are not mature and institutionalised in South African PGs. The main research objective of this research was:

RO_M. *To propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).*

The research approach of this research study, to achieve RO_M, depended on a combination of interpretivism and positivism. A combination of the inductive and deductive research approach was used. A case study and survey strategy were used to collect and analyse data and address the aims of the study. Results collected in this research study were qualitative. The research used the Western Cape Government (WCG) as a case study to evaluate the proposed methodology to institutionalise UX in a South African PG.

Three UX maturity models were identified (Chapter 3) and incorporated into a survey, together with related UX questions (Chapter 5), to measure the UX maturity level of South African PGs. The results demonstrated low maturity levels and a lack of understanding and buy-in of UX at South African PG level. An Institutionalise User Experience in Government (IUXG) methodology for South African PGs was proposed and updated throughout this research study (Chapter 4; Chapter 6; Chapter 8). The WCG was selected as the case study to implement the IUXG methodology (Chapter 7).

Two surveys (follow-up (Chapter 6) and confirmation (Chapter 8)) were administered to WCG e-Government website officials before and after the implementation of the IUXG methodology. The surveys measured the UX maturity level of the WCG in the directorate, e-Government for Citizens (e-G4C), responsible for the WCG e-Government website. After the implementation of the IUXG methodology, the WCG showed improved levels of UX maturity on all three identified UX maturity models in the final survey.

The results of the implementation of the IUXG methodology, as a case study in the WCG, resulted in: an improved UX maturity level; UX activities became standard in the e-Government website environment; the SDLC was updated to incorporate UCD and became standard; UX policy, strategy and guidelines were documented; the first usability testing facility for a South African PG was built; a gap analysis for the WCG was compiled and improvements to the WCG e-Government website were implemented. The IUXG methodology institutionalised UX in the WCG e-Government website environment. The main research objective of this research (RO_{M.}) was achieved:

to propose and evaluate a methodology for institutionalising UX in a South African PG (IUXG 2.0).

Other South African PGs can use the IUXG methodology to institutionalise UX in their e-Government website environments.

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Appendix A: University Ethics Clearance

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Ref: H12-Sci-CS-013

Contact person: Mrs L Roodt

Student No: 200315269

Date: 17 August 2012

Mr Marco Pretorius
11 Swellengrebel Street
Van Der Stel
Port Elizabeth
6025

Dear Mr Pretorius

TITLE OF PROJECT: A METHODOLOGY TO INSTITUTIONALISE USER EXPERIENCE IN A SOUTH AFRICAN PROVINCIAL GOVERNMENT.

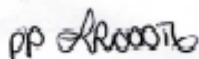
Your above-entitled application was considered and approved by the Sub-Committee for Ethics approval in the Faculty of Science on 08 August 2012.

The Ethics clearance reference number is **H12-Sci-CS-013**, and is valid for three years. Please inform the FRTI Committee, via your faculty officer, if any changes (particularly in the methodology) occur during this time.

An annual affirmation to the effect that the protocols in use are still those, for which approval was granted, will be required from you. You will be reminded timeously of this responsibility, and will receive the necessary documentation well in advance of any deadline

We wish you well with the project. Please inform your co-investigators of the outcome, and convey our best wishes.

Yours sincerely



**Chairperson: Faculty Research, Technology and Innovation Committee
(Faculty of Science)**

cc: Department of Research Capacity Development
Faculty Officer, Faculty of Science

Appendix B: Western Cape Government Approval to Publish Results



**DEPARTMENT
of the PREMIER**
Provincial Government of the Western Cape

Centre for e-Innovation (CeI)
e-Government for Citizens (e-G4C)
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Publication of e-Government for Citizens work and research as part of PhD studies

The purpose of this document is to obtain approval and permission to publish work and research relating to e-Government for Citizens, e-Government and Usability and Design. Marco Pretorius, e-G4C Usability Team Leader, is registered at the Nelson Mandela Metropolitan University, conducting research towards obtaining a PhD degree. The research is directly related to usability in e-Government in the Provincial Government of the Western Cape (PGWC). The research conducted is of direct benefit to PGWC as it will strengthen usability work and processes conducted. The published research would also allow national government and other provincial governments to follow correct usability processes. The work will be published in research papers for conferences, journal articles, related websites and as part of the PhD thesis.

Marco Cebus Pretorius
e-Government for Citizens: Usability Team Leader
Date: 2011.05.09

Recommended / ~~not recommended~~

Clayton Edmund Wakeford
Director: e-Government for Citizens
Date: 2011.05.09

Approved / ~~not approved~~

Hilton Arendse
Chief Director: Strategic ICT Services
Date: 2011-05-12

Appendix C: Survey for South African Provincial Governments



PhD RESEARCH SURVEY

User Experience and Usability Maturity of South African Provincial Government websites

Goal of Survey

The goal of this survey is to determine the level of maturity of User Experience (UX) and usability processes within Provincial Governments. Our goal is to determine if Provincial Governments use usability and UX practices and processes when developing their websites. The ultimate goal of the study is to provide a methodology to guide website development for Provincial Governments in South Africa.

Value of Survey

Your feedback is much appreciated and will help us to provide a usability and UX methodology that Provincial Governments can use. You will be provided with a summary of the findings.

Who is Conducting this Survey?

Marco Pretorius, a student at the *Nelson Mandela Metropolitan University*, is conducting this research as part of his PhD studies. He is working together with Prof Andre Calitz from the Department of Computing Sciences at the Nelson Mandela Metropolitan University in Port Elizabeth.

Instructions:

- **Answer Sections 1 – 5.**
- The survey should take 15-20 minutes to complete.
- Your name will not be associated with any data.
- There is a list of definitions at the end of the document, should you require any clarity, feel free to e-mail marco.pretorius@gmail.com
- Please e-mail your completed document to marco.pretorius@gmail.com

We thank you for your participation.

SECTION 1: Demographics

- a. What Provincial Government do you represent?
- b. What is your job title?
- c. What is the name of the Directorate in which you are employed?

SECTION 2 – 4: UX maturity models

By applying usability and UX methods, websites or applications that are practical, useful, usable and satisfying can be built. Typically, organisations progress through a sequence of stages as their usability and UX processes evolve and mature. Research shows that the sequence is fairly universal; hence you can match your own organisation, in the sections below, to see what your next stage is likely to be. Please use the following sections to rate at what stage/level your Provincial Government currently is in terms of usability and UX.

Please continue to the next page.

SECTION 2: Please indicate at what stage (one only) of usability maturity your Provincial Government is on the Nielsen scale:

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8
Hostility Toward Usability	Developer-Centered Usability	Skunkworks Usability	Dedicated Usability Budget	Managed Usability	Systematic Usability Process	Integrated User-centred Design	User-Driven Corporation
Developers simply do not want to hear about users or their needs.	The organisation realises the value of making designs easier for humans to use.	Despite all the barriers, at this stage, a few groups within the organisation will initiate small usability efforts.	The organisation starts to invest more in usability.	Usability has " <i>made it</i> ".	The organisation has recognised the need for an actual user-centred design process, with multiple activities and milestones.	Each development lifecycle step is infused with user data, including the project definition itself and the requirements phase.	User data does not just define individual projects, it determines what types of projects should be funded.
Users are told to use the system, even if it is not pleasant to do so.	The design team relies on its own intuition (not through usability testing) about what constitutes good usability.	There is still no official recognition of usability, nor is there an approved budget allocated in advance.	A dedicated budget for usability exists.	There is an official usability group, led by a usability manager who has a charter to " <i>own</i> " usability.	On important projects, the team conducts early user research before design begins.	Quality is often tracked through quantitative usability metrics.	The organisation employs user research to determine its overall direction and priorities.
		All usability activities are ad hoc.	The main usability method is user testing late in the development process.	The usability group refines its methodology as members learn from each other.	The organisation has a user interface design standard or a centralised definition of preferred design patterns.	Usability data is starting to be used to determine what Web services should be built.	Usability methods affect corporate strategy and activities beyond interface design.
				The usability budget is too limited to implement all the recommended usability activities for all projects.	Even projects without many usability resources go through at least some form of usability review before they are approved for release.		The concept of total user experience is extended beyond the screen to other forms of customer interactions with the company.

Your Provincial Government's stage of maturity:

SECTION 3: Please indicate at what level (one only) of usability maturity your Provincial Government is on the Schaffer and Earthy scale:

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
Clueless	Piecemeal Usability	Managed Usability	Infrastructure	Staffing	Routine Usability
At this level, the organisation is unaware of usability as a formal discipline.	Individuals are trying to apply usability techniques to some projects but there is no commitment by the organisation, and usability is not managed under an overall strategy.	The organisation recognises the need for usability as a core competency.	There is a solid infrastructure for usability work and a user-centred methodology is being followed.	At this level there is sufficient staff to handle the full set of projects executed by the government.	Usability is a routine practice and has been institutionalised.
Design is based on intuition and political arguments.	The effort is not integrated or accepted in the design process.	An executive champion has been identified and usability is part of a plan.	Reusable templates and tools are in place.	All projects have usability support to an appropriate level.	Projects do not proceed without usability being involved.
Any usability effort is directed by a stream of complaints and demands from customers.	Very good work can happen at this level, but usability is immature and not yet institutionalised.	Although much more work needs to be done, the usability effort is no longer fragmented experiments.	Usability industry standards are followed.		The usability practitioners have a strong and mature voice and lead design from the front.

Your Provincial Government's level of usability maturity:

SECTION 4: Please indicate at what level (one only) of usability maturity your Provincial Government is on the Temkin's scale:

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Unrecognised	Interested	Invested	Committed	Engaged	Embedded
UX is not important.	UX is important but receives little funding.	UX is very important and formalised programmes emerge.	UX is critical and executives are actively involved.	UX is one of the core tenets of the organisation's strategy.	UX is in the fabric of the organisation; not discussed separately.

Your Provincial Government's level of usability maturity:

SECTION 5: Please answer the following questions in relation to your Provincial Government.

- a. Do you have usability and User Experience (UX) employees in your organisation?
If yes, please list their job titles/roles.
- b. Is usability and UX Design recognised as a unique and valued skill?
- c. Do you have executive support?
- d. Do you have a usability/UX strategy?
If yes, is it reviewed and updated regularly?
- e. Are usability and UX a part of your development lifecycle (specifically for the website)
- f. Are usability and UX exposure / training available to UX employees?
Are they available to other employees?
- g. What challenges do you have in adopting and embedding usability and UX methods and tools in your Provincial Government?

h. Which usability and UX methods and tools are used in your Provincial Government (mark as many as applicable)?

Accessibility testing		Formal usability inspections		Questionnaires	
Affinity diagrams		Free listing		Remote evaluation	
Brainstorming		Functionality matrix		Requirements gathering	
Card sorting		Guidelines checklist		Requirements meeting	
Charrettes		Heuristic Evaluations		Screen snapshots	
Claims analysis		Information architecture		Self-reporting logs	
Cognitive walkthroughs		Interface/Interaction design		Standards inspections	
Competitor analysis/ Benchmarking		Interface design patterns		Stakeholder meeting	
Content analysis		Interviews		Storyboarding	
Consistency inspection		Log analysis/ Web metrics		Styleguides	
Contextual Inquiry		Market research		Surveys	
Context of use analysis		Parallel design		Task analysis	
Critical Incident Technique		Participatory evaluation/design		Usability planning	
Cultural probe		Performance measurement		Usability testing	
Diary study		Personas / user profiles		Usability and UX training	
Design guidelines		Photo study		Use cases / Scenarios	
Ethnographic study/ Field observation		Pluralistic walkthroughs		User experience modelling	
Eye tracking		Post release testing		Wireframes	
Feature inspection		Prototyping		Writing for the Web	
Focus groups		Quality assurance testing			

- i. Do you have any other comments related to usability or UX in your Provincial Government?

Thank you for your time!
Results will be shared with you when the study is complete.

Important Definitions:

Usability

Usability is a quality attribute relating to how easy something is to use. More specifically, it refers to how quickly people can learn to use something, how efficient they are while using it, how memorable it is, how error-prone it is, and how much users like using it

User experience (UX)

All aspects of the user's experience when interacting with the system that produce the user's perceptions. UX design refers to making systems and services that are not only usable but also useful and appealing

Appendix D: Western Cape Government User Experience Methods

WCG UX Methods (Services): Definitions and Descriptions				
Type of method	Methods (Services)	Definition	Description of the Service	References on How to Execute the Service
User research	Focus groups	A moderated discussion amongst a group of people who discuss a topic under the direction of a facilitator whose role is to promote interaction and keep the discussion on the topic of interest (Stewart, Shamdasani and Rook, 2007).	<p>Focus groups are conducted to obtain direct user input before the website/system is wireframed.</p> <p>Focus groups are also conducted for existing websites/systems that will be redesigned.</p> <p>Focus groups are not used as a method to evaluate a website after launch; usability testing is the appropriate service for such an exercise.</p>	<p>WebCredible. 2006 – See References.</p> <p>Stewart, Shamdasani and Rook,, 2007 – See References</p> <p>Pretorius and Calitz, 2012 – See References.</p>
	Surveys	Surveys are structured interviews with users, where a list of questions is displayed online (or in other formats) and users' responses are recorded (Usability.gov, 2012).	<p>Surveys are used to obtain direct input from users regarding websites/systems. Surveys can be used before or after a website is launched.</p> <p>Survey Monkey (www.surveymonkey.com) is generally used as the survey tool.</p>	<p>www.usability.gov/methods/analyze_current/learn/surveys.html</p>

WCG UX Methods (Services): Definitions and Descriptions

Type of method	Methods (Services)	Definition	Description of the Service	References on How to Execute the Service
Design	Wireframes	A wireframe is a low-fidelity visual representation (typically with no graphical treatment) of a website's or system's layout design. A wireframe represents the basic page layout structure and navigational scheme of the pages, as well as major website/system components (Shorr, 2011).	Wireframes are created to reflect the information architecture and navigation of a website or system.	<p>Van Duyne, Landay and Hong, 2007 – See References.</p> <p>Shneiderman, B. and Plaisant, C., 2010. Designing the User Interface: Strategies for Effective Human-Computer Interaction. 5th Edition. Addison-Wesley.</p> <p>http://sixrevisions.com/user-interface/wireframing-benefits/</p> <p>Tidwell, J., 2011. Designing Interfaces. Second edition. O'Reilly Media.</p>
	Web design	The visual design creates the detailed appearance of a website or system by describing the colours, graphics, typography and screen layout of the user interface (Elsevier, 2012).	Design is provided as a follow-up step to wireframes. Design for websites is the focus and most common task of the design team. Cascading Style Sheets (CSS) stylesheets are also created for websites.	<p>Van Duyne, Landay and Hong, 2007 – See References.</p> <p>Shneiderman and Plaisant, 2010 – See “Wireframes” above.</p> <p>Tidwell, 2011 - See “Wireframes” above.</p>

WCG UX Methods (Services): Definitions and Descriptions				
Type of method	Methods (Services)	Definition	Description of the Service	References on How to Execute the Service
	Templates	Wireframes and design templates can be created for reuse (Schaffer, 2004). Templates are blueprints of common elements on websites or systems that can minimise rework and enforce consistency.	<p>Templates are supplied as a roadmap for developers to apply consistent design that corresponds with UX policy and guidelines.</p> <p>Each template consists of:</p> <ul style="list-style-type: none"> • A detailed wireframe; • A sample design; • Supporting documentation and guidelines. 	See “ <i>wireframes</i> ” and “ <i>Web design</i> ” references above.
Usability testing	Heuristic evaluations	A heuristic evaluation is a form of usability inspection that involves the study of the user interface by a usability/UX analyst who looks for infringements and enforcement of common usability principles (Barnum, 2002).	Heuristic evaluations are provided for WCG websites and systems.	www.useit.com/papers/heuristic/heuristic_list.html Usability.gov, 2012d – See References.
	Usability laboratory testing	Usability laboratory testing involves measuring the performance of users on tasks with regard to the ease of use, the task time and the user’s perception of the experience of the website or system (Nielsen, 2003b).	The UX team in e-G4C has a usability laboratory (Section 7.3.5.2) where usability testing is conducted on WCG websites and systems.	Pretorius, 2005 – See References. Usability.gov, 2012d – See References. Pretorius and Calitz, 2010 – See References.

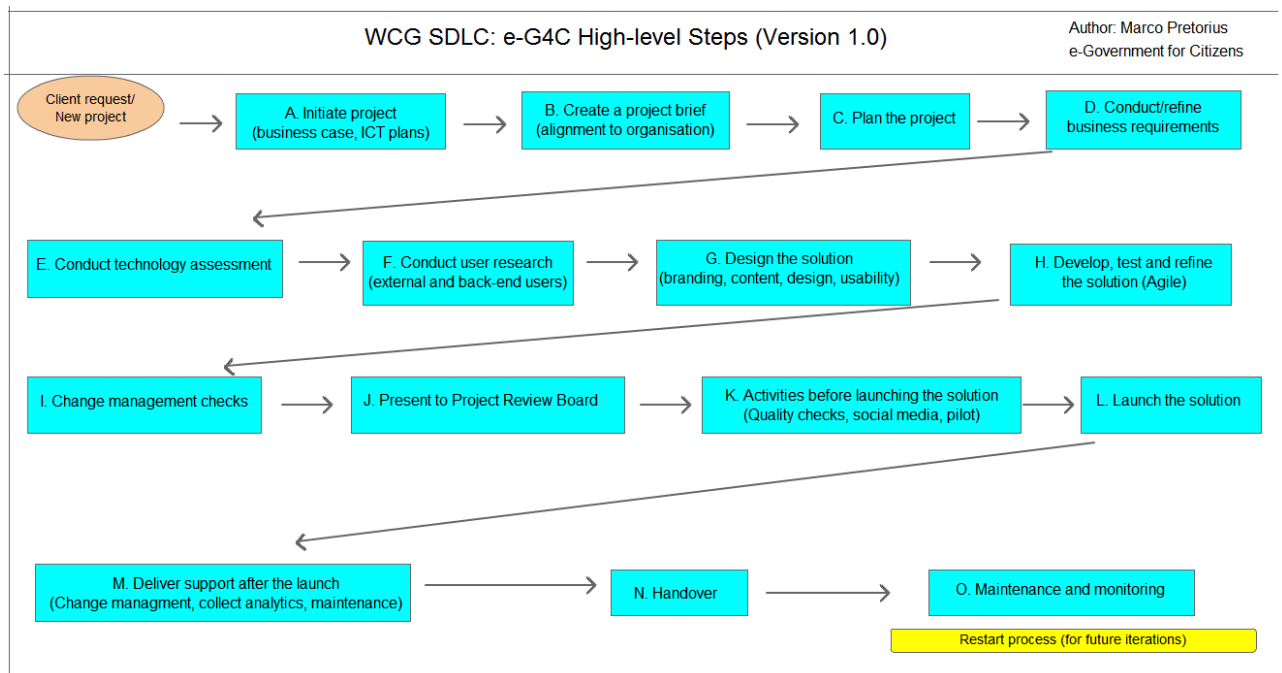
Appendix E: Initial e-Government for Citizens Systems Development Lifecycle Including UX Activities

The table below demonstrates the steps that were agreed upon for the first iteration of the e-Government for Citizens Systems Development Lifecycle (SDLC) and is explained in Chapter 7, Sub-section 7.3.2.5.

Initial e-G4C SDLC Approach Including UX Activities	
Step	Activity
	<i>REQUIREMENTS</i>
1	Collect stakeholder feedback on current website. Collect wish list items for updated website.
2	Conduct a workshop with all stakeholders to develop a simple requirements document.
3	Sign-off requirements document.
	<i>UX</i>
4	Create and update wireframes.
5	Heuristic evaluation of wireframes.
6	Wireframes review presentation to stakeholders.
7	Sign-off wireframes.
8	Create and update design.
9	Heuristic evaluation of design.
10	Design review presentation to stakeholders.
11	Sign-off design.
12	Deliver Photoshop files (PSDs) and CSS to Technology team.
	<i>TECHNOLOGY</i>
13	Drupal Development preparation.
14	Development Iteration 1 (without design) Prototype site.
15	Iteration 1 (without design).
16	Presentation to small stakeholder group.
17	Iteration 2 (including design).
18	Final development phase.
19	Sign-off development.
	<i>CONTENT</i>
20	Prepare content.
21	Update content and prepare for upload.
22	Load content and quality assurance.
23	Final content check and feedback.
	<i>CHANGE MANAGEMENT</i>
24	Stakeholder training
	<i>DELIVER WEBSITE</i>
25	Final sign-off.
26	Launch website.

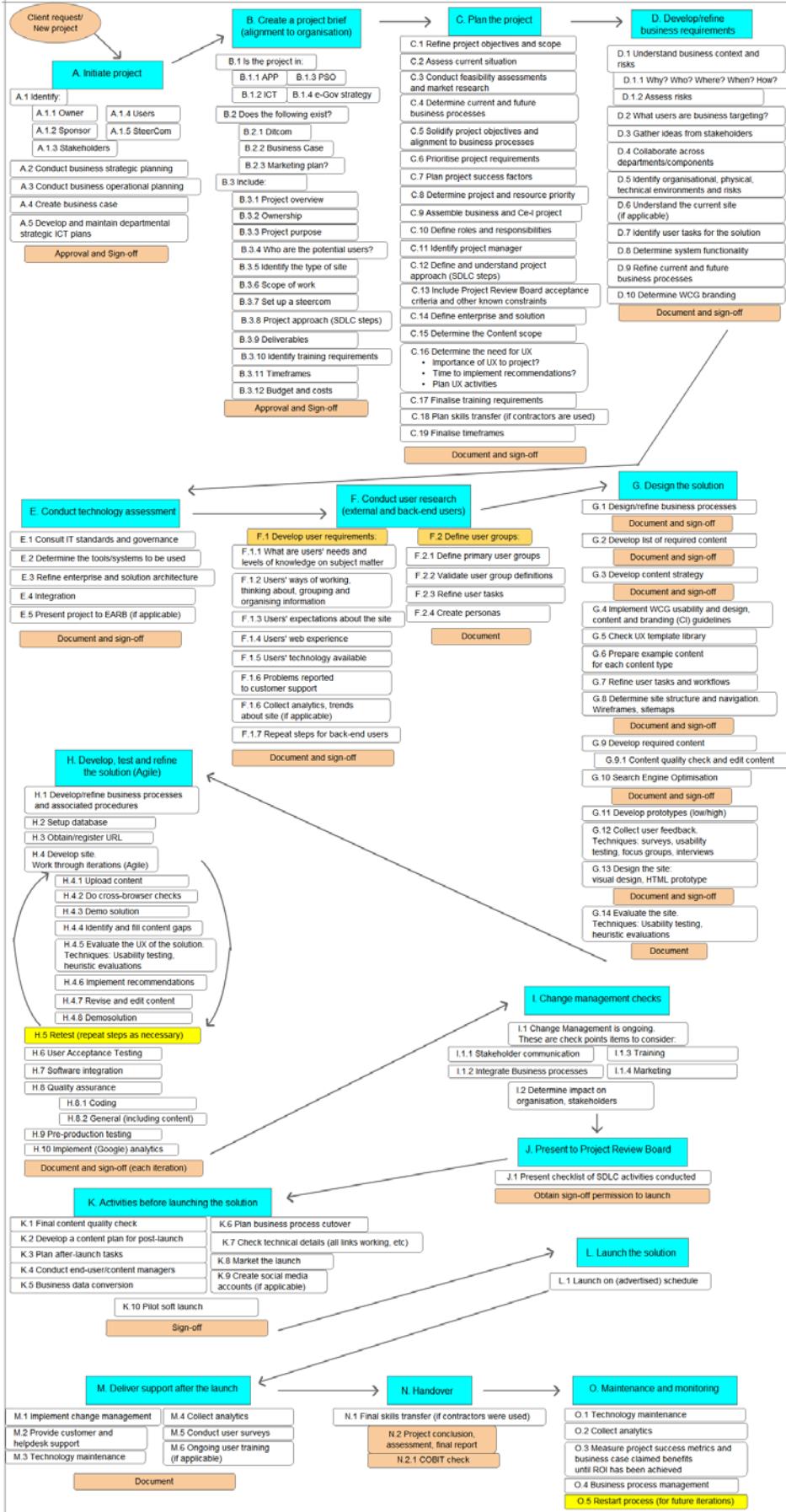
Appendix F: E-Government for Citizens Proposed Systems Development Lifecycle

The following figures illustrate the proposed e-G4C and WCG Systems Development Lifecycle and were listed in Chapter 7, Sub-section 7.3.5.3.



WCG SDLC: e-G4C Steps and Activities (Version 1.0)

Author: Marco Pretorius
e-Government for Citizens



Appendix G: Definitions of User Experience and Supporting Staff

The table below describes UX and supporting website team staff, discussed in Chapter 7, Sub-section 7.3.3.

Definitions of UX and Supporting Staff to the UX Team in Order to Deliver a Website		
Supporting Area	Job Title	Definition/Responsibilities
UX (See Chapter 7)	UX Manager	Manages the UX team, including policy, strategy, projects, research and UX staff. The UX manager needs to be the lead evangelist of UX.
	Information Architect	Produces prototypes, sitemaps, information architecture and wireframes of websites and systems. The information architect is also responsible for delivering the wireframes.
	Usability Engineer	Conducts usability testing, including formal laboratory testing, eye tracking, informal testing, walkthroughs, expert evaluations and heuristic evaluations.
	Senior Web Designer	Designs concepts and prototypes, implements branding and delivers the full design of a website or system.
	Web Designer	Supports the Senior Web Designer to produce design concepts, image and graphic enhancements and design, PSD files and CSS. The Web Designer will provide support to the Senior Web Designer.
	User Researcher	Conducts surveys, questionnaires, interviews, focus groups, personas, user profiles and research. The User Researcher can support the Usability Engineer.
	UX Designer	Supports the Information Architect to produce information architecture and wireframes. The UX designer conducts research on usability and design best practices, current and new technologies (for example, mobile best practices) and assists the Usability Engineer in the usability laboratory. The UX Designer will provide support to the Information Architect and Usability Engineer.
Technology (Courtesy of Luke van Blerk, Western Cape Government)	Technology Manager	Manages a team of professionals and service providers, directly or indirectly, that are necessary to perform and deliver services in accordance with the approved requirements and prioritised needs relating to business and technology planning, development, implementation and maintenance.
	Developer	Develops and maintains Drupal Web applications including research, site building, module development, integration, theming, testing and debugging.
	Test Engineer	Develops and executes software test plans in order to identify software problems and their causes.

Definitions of UX and Supporting Staff to the UX Team in Order to Deliver a Website		
Supporting Area	Job Title	Definition/Responsibilities
	Application Development Manager	Manages a team of professionals and service providers that are necessary to perform and deliver services in accordance with the approved requirements and prioritised needs relating to systems and applications planning, development, implementation and maintenance.
	Solution Architect	Designs solutions that best meet the business requirements and assumes the lead technical role in their development and implementation.
	System Administrator	Responsible for effective provisioning, installation/configuration, operation and maintenance of systems hardware and software and related infrastructure.
	Scrum master	Facilitates agile development process, conducts agile planning sessions, daily stand-ups and retrospectives.
Content (Courtesy of Thomas Bevan, Western Cape Government)	Managing Editor	Provides overall strategic guidance regarding online content for the Provincial Government and identifies new opportunities for using online content to improve service delivery in the Provincial Government.
	Content Strategist	Guides the creation, delivery and governance of online content at the Provincial Government and develops repeatable systems for content development and maintenance of new and existing websites.
	Content Writers	Create and maintain the online content published by the Provincial Government.
	Content Editors	Ensure that all the online content published by the Provincial Government is comprehensive, accurate and meets the needs of users.
	Translators	Ensure that all the online content published by the Provincial Government is available in all three official languages of the Provincial Government (namely Xhosa, Afrikaans and English in the Western Cape Government).
	Social Media Managers	Engage with the public via social media, and ensure that relevant government information and services are shared via relevant social media channels.
	Subject Matter Specialist	Develops comprehensive and accessible online content on specific subjects so that these can be accessed and understood by the public.
Other	Brand Strategist	The Brand Strategist builds relationships with key markets through the definition and consistent representation of the Provincial Government's branding elements. The role often entails creating or presenting branding guidelines and understanding how they apply to different projects. (Unger and Chandler, 2009 – see References)
	Business Analyst	The responsibility of the Business Analyst is to analyse and

Definitions of UX and Supporting Staff to the UX Team in Order to Deliver a Website		
Supporting Area	Job Title	Definition/Responsibilities
		<p>formulate business processes and structures which will effectively support clients in the acquisition and maintenance of applications as well as in the necessary supporting, consulting and QA services. By analysing the business needs of their clients and stakeholders, they help to identify business problems and propose solutions, by using the discipline of business analysis.</p> <p>(Western Cape Government. 2011. PGWC Internet & Intranet Portal Development Programme. Report.)</p>
	Project Manager	<p>The Project Manager performs the day-to-day management of the project throughout all defined project phases and ensures that contractual requirements and client expectations are satisfied. The Project Manager's primary responsibility is to ensure that the project produces the required products to the required standard of quality and within the specified constraints of time and cost.</p> <p>(Western Cape Government. 2011. PGWC Internet & Intranet Portal Development Programme. Report.)</p>
	Change Manager	<p>The Change Manager plays a vital part in communicating, planning and delivering change management activities on large-scale transformation programmes.</p> <p>(Western Cape Government. 2011. PGWC Internet & Intranet Portal Development Programme. Report.)</p>
	Trainers	<p>Trainers provide full training and assessment services in support of the website programme. The main focus is back-end training to educate content writers on how to publish and upload content. Front-end training is only done for expert user systems.</p> <p>(Western Cape Government. 2011. PGWC Internet & Intranet Portal Development Programme. Report.)</p>
	Stakeholder Managers	<p>The Stakeholder Manager is responsible for the process of forming, monitoring and maintaining constructive relationships with stakeholders by influencing their expectations of proportional gain which results from their investment.</p> <p>http://www.businessdictionary.com/definition/stakeholder-management.html#ixzz2BiDkRtxG</p>
	Communications	<p>The Communications team (typically Corporate Communications) is responsible for branding and marketing in the Provincial Government. The Communications Lead has the overall responsibility of day-to-day management of communication for the programme, as well as planning and development of overall communications strategies.</p> <p>(Western Cape Government. 2011. PGWC Internet &</p>

Definitions of UX and Supporting Staff to the UX Team in Order to Deliver a Website		
Supporting Area	Job Title	Definition/Responsibilities
		Intranet Portal Development Programme. Report.)
	Website Manager	The Website (Programme) Manager is responsible for the day-to-day management of the Provincial Government website. The Website Manager brings together related projects to manage their interdependencies. The Website Manager provides and maintains a strategic view over the set of projects, aligning and co-ordinating them within a programme of business change in support of specific business strategies. (Western Cape Government. 2011. PGWC Internet & Intranet Portal Development Programme. Report.)
	Procurement Specialist	The job purpose of the Procurement Specialist is to manage and oversee the procurement of services in a fair, equitable, transparent, competitive and cost-effective manner. The Procurement Specialist is responsible for policy research, development, monitoring and adherence to prescripts, delegations and procedures within the Provincial Government. (Western Cape Government. 2012. Procurement Job Dewscription).

Appendix H: User Experience Resources

The table below illustrates a list popular user experience (UX) resources used by the UX team as discussed in Chapter 7, Sub-section 7.3.5.4.

Website Links	Books	Twitter (www.twitter.com) Users
<p>Website links:</p> <ul style="list-style-type: none"> • Official usability and website guidelines of governments from around the world: <ul style="list-style-type: none"> ◦ http://usabilitygeek.com/official-usability-web-site-guidelines-of-governments-from-around-the-world/; • Usability.gov: <ul style="list-style-type: none"> ◦ www.usability.gov; • Jakob Nielsen’s website: <ul style="list-style-type: none"> ◦ www.useit.com; • User Interface Engineering: <ul style="list-style-type: none"> ◦ www.uie.com; • Human Factors International: <ul style="list-style-type: none"> ◦ www.humanfactors.com; • User Experience Professionals’ Association: <ul style="list-style-type: none"> ◦ http://www.upassoc.org/; • Webcredible: <ul style="list-style-type: none"> ◦ http://www.webcredible.co.uk/; • Howto.gov: <ul style="list-style-type: none"> ◦ http://www.howto.gov/; • World Wide Web Consortium: Web Content Accessibility Guidelines 1.0: <ul style="list-style-type: none"> ◦ http://www.w3.org/tr/wai-webcontent/ 	<ul style="list-style-type: none"> • Institutionalization of Usability: A step-by-step guide (Schaffer, 2004); • Prioritizing Web Usability (Nielsen and Loranger, 2006); • The design of sites. Second edition (Van Duyne, Landay and Hong, 2007); • Measuring the User Experience. (Tullis and Albert, 2008); • A Project Guide to UX Design: For user experience designers in the field or in the making (Unger and Chandler, 2009) • Designing the user interface. Fifth Edition (Shneiderman and Plaisant, 2010); • Eyetracking web usability (Nielsen and Pernice, 2010); • Designing interfaces. Second edition (Tidwell, 2011); • Usability in Government Systems: User Experience Design for Citizens and Public Servants (Buie and Murray, 2012)’ 	<ul style="list-style-type: none"> • Aslam Levy (@aslam_levy) • Arthur Goldstuck (@art2gee) • Cyd Harrel (@cydharrel); • DifferentUX (@DifferentUX); • Ethan Marcotte (@beep); • GfK User Centric (@UserCentricInc); • Human Factors International (@humanfactors); • Jared M. Spool (@jmspool); • Jeffrey Zeldman (@zeldman); • Justin Mifsud (@justinmifsud); • Luke van Blerk (@lukevanblerk); • Luke Wroblewski (@lukew); • Marco Pretorius (@PretoriusMarco); • Martha Lane Fox (@marthalanefox); • Nielsen Norman Group (@NNgroup); • Peter Morville (@morville); • Rian van der Merwe (@RianVDM); • Steve Krug (@skrug); • Thomas Bevan (@herdingwords); • UIE (@uie); • UsabilityOne (@UsabilityOne); • UX Magazine (@uxmag); • UXmatters (@uxmatters); • UX Myths (@uxmyths). • UX News and Ideas (@use_this)

Appendix I: Western Cape Government Gap Analysis

The Western Cape Government (WCG) case study evaluation results discussed in Chapter 7, Section 7.3, allows for the compilation of a gap analysis. A gap analysis is a technique for determining the steps to be taken in moving from a current state to a desired future state. The table below illustrates the gap analysis for the WCG based on the case study results for the proposed Institutionalise User Experience in Government (IUXG) methodology.

The WCG limitations column in the table below has an associated colour illustrating the degree to which the WCG complies to the specific steps:

- Green illustrates that a step is implemented successfully;
- Orange illustrates that a step is implemented, but that more work is required;
- Red illustrates an area that has shown limited implementation.

The gap analysis identified 23 steps that were implemented successfully (green); 12 steps that required more work (orange) and two steps that have shown limited implementation (red).

Western Cape Government Gap Analysis		
Phase	Step	Western Cape Government Limitations
A. Startup	A1. Measure UX maturity level	The UX consultant usability and UX maturity rating for the WCG (Chapter 8) were as follow: Nielsen: stage 6; Feijo: level 3; Schaffer: level 3 (with elements of level 4). The UX maturity model levels have improved (Chapter 8, Section 8.2); however, the WCG is not yet at the final level of each UX maturity model.
	A2. Measure usability of current site.	The usability of the current site was measured in order to provide buy-in as well as a wake-up call.

	A3. Initialise a wake-up call	A wake-up call was successfully initialised.
	A4. Acquire an executive champion	An executive champion was successful required.
	A5. Procure a UX consultant	A usability team leader (author of this research) was employed as the UX consultant.
	A6. Understand the company culture	Key aspects of the company culture that would affect UX projects were successfully identified and resolution methods were put in place.
	A7. Obtain buy-in	Support is provided for UX in e-G4C. More buy-in is required for wider WCG projects.
B. Setup		
	B1. Develop UX strategy, policy and guidelines	UX strategy, policy and guidelines have been developed.
	B2. Supporting strategies, policies and guidelines	Several supporting strategies, policies and guidelines are still in development.
	B3. Select UX methods	UX methods have been selected.
	B4. Setup budget and procurement	Procurement remains a challenge. Budget exists for the UX team; however, more budget is required for the increasing number of projects.
	B5. Define general UCD approach	The general UCD process was defined and implemented in e-G4C.
	B6. Conduct training	Skills training is available for UX staff. Knowledge training is conducted throughout the organisation.
C. Organisation		
	C1. Define the UX organisational structure	An effective centralised structure currently exists. A matrix structure is required in the long-term.
	C2. Define and recruit UX staff	More UX staff/contractors need to be available as the amount of projects increase.
	C3. Support required from other staff (other roles)	Lack of development resources. Lack of content ownership.
	C4. Using contractors	E-G4C had both good and poor experiences with contractors. The relationship between e-G4C and contractors needs to be managed continuously with a clear statement of work and collaboration on deliverables.

D. Method	D1. Determine the need for UX	This step was included in the updated SDLC.
	D2. Identify the type of site	This step was included in the updated SDLC.
	D3. Create a proposal	This step was included in the updated SDLC.
	D4. Plan the project	This step was included in the updated SDLC.
	D5. Develop business requirements	This step was included in the updated SDLC. Business requirements remain a challenge as it is not conducted effectively for e-G4C projects. Dedicated business analysts are required.
	D6. Conduct user research	This step was included in the updated SDLC. User research is conducted, but not for all website projects. User research needs to be conducted more often.
	D7. Design the site	This step was included in the updated SDLC. Content (inventory and strategy) is required before the wireframe and design process can start. Accessibility guidelines from the WCG UX Guidelines document need to be implemented on the new CMS platform. Sign-off meetings need to be scheduled far in advance. Stakeholders need to send representatives who can sign off if they cannot attend the sign off meeting.
	D8. Develop the site	This step was included in the updated SDLC. Migration from the old CMS to the new CMS is required. More development resources are required for development and migration.
	D9. Test and refine the site	This step was included in the updated SDLC.
	D10. Launch the site	This step was included in the updated SDLC. The WCG e-Government website needs to have stronger marketing campaigns. Do not plan for development on the launch day.
	D11. Deliver support after the launch	This step was included in the updated SDLC. A formal and improved changed management process is required.
E. Standards	E1. Create templates	UX documents and form templates are used. Wireframe and design templates are used by the UX team.

	E2. Create a testing facility	A usability laboratory was constructed for usability testing.
	E3. Standardise processes	The SDLC process was updated and is currently in a new pilot and sign-of phase.
	E4. Compile best practices and guidelines	A WCG UX guidelines document, based on international best practice and guidelines, was established and is in use. A list of UX resources was identified and is used by the UX team.
F. Long-term	F1. Maintain the management relationship	The management relationship was maintained. On-going.
	F2. Maintain UX awareness	UX awareness was created throughout the research study. On-going.
	F3. Collect metrics	Metrics of the WCG e-Government website is collected on a monthly basis. On-going.
	F4. Adhere to laws and regulations	The WCG e-Government website complies with current laws and regulations. On-going.
	F5. Stay up to date with latest trends and research	The list of UX resources (E4) identified is used to keep up to date with the latest trends and research. On-going.

Appendix J: Third International Symposium on Web Society Paper (2011)

The Use of Focus Groups to Improve an e-Government Website

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Abstract

The growth in Africa's Internet and broadband sector has significantly increased in recent years, specifically in the e-Government sector. The Internet has become an essential tool to disseminate information to citizens; however, poorly designed websites cause frustration. This paper focuses on the Provincial Government of the Western Cape (PGWC) e-Government website which had noticeable usability problems. Focus groups were conducted to obtain information requirements and the typical tasks performed by users. This information was utilised for the creation of a new e-Government website. The focus groups were also utilised to identify usability problems on the current website. This paper illustrates how the focus groups were conducted and explains the results which had an impact on the current and new website design. An improved checklist for conducting focus groups is provided. This is the first usability method used to improve the PGWC website since 2004 and the first time focus groups have been used within this environment.

1. Introduction

The growth in Africa's Internet and broadband sector has accelerated in recent years [1] and this growth could be used as a critical tool by a government in the form of e-Government [2]. Governments worldwide have made significant attempts to publicise information and services offered on the Internet [3]. E-Government, also known as digital or online government, is the use of Information and Communication Technologies (ICT) to provide more efficient government services, empower citizens through access to information and facilitate communication between government and the community [4]. A large number of e-Government systems fail to achieve these goals [5]. Currently, there is an increase in the use of e-Government and visits to government websites will continue to grow in the future [6]. A website that is not easy to navigate and does not match user needs and requirements increases the task difficulty and complexity. The Internet has become a crucial tool to disseminate information to citizens, but poorly designed websites can drive a wedge between a government and the people [7].

Citizen's higher perception of the usefulness and ease of use of e-Government websites directly enhances the level of the citizen's continued intention to use e-Government websites [8]. One of the reasons for the lack of success of e-Government is that systems tend to focus primarily on the technical aspects and less on the users [9]. Given its large

presence in citizens' daily lives, it is essential that government agencies not only involve citizens in developing websites, but also measure and report how a website is meeting users' needs [6].

Poor usability is a major obstacle in several countries [8]. The consensus among researchers is that usability is an important factor in designing e-Government websites; however, there is some disagreement as to the extent that usability has been achieved in the majority of e-Government systems [5]. In addition, Southern Africa has users with different cultural backgrounds (South Africa itself having 11 official languages), with a large portion of the population not being computer literate. In developing countries such as South Africa, education and the computer and Internet skills of users vary significantly; and this influences the user's ability to use interactive computer systems.

Focus groups were conducted for the first time to learn about the users, their typical tasks and to obtain insights into the reasons they visit the website. A focus group is defined as a moderated discussion amongst a group of people who discuss a topic under the direction of a facilitator whose role is to promote interaction and keep the discussion on the topic of interest [10]. The focus group information was used for two reasons: firstly as input to the development of the new/future website (wireframes, information architecture, design); and secondly to enhance the current website by finding insights into the usability problems on the current website. This paper illustrates how the focus groups were conducted and also describes the results of the focus groups.

The results, as well as the summarised method will be of value in South African provincial government environments. The recommendations have implications for government officials, information technologists, website designers, usability evaluators and specifically e-Government website designers. A theoretical background on usability, focus groups and e-Government in the Provincial Government of the Western Cape (PGWC) is provided in Section 2. The case study design (Section 3) and the results of the case study in Section 4. Section 5 concludes and contextualises the findings and provides suggestions for future research.

2. Literature review

2.1. Usability and focus groups

In 1994, usability was described as gathering data about the usability of a design or product by a specific group of users for a particular activity within a specified group of uses or work context [11]. In 2007, this description was expanded to include the user experience, indicating that usability included both the usability of the system, e.g. how effective, efficient, safe and learnable it is, as well as the users' experience when interacting with the system, e.g. how satisfying, enjoyable, or motivating the interaction is [12]. Problems with website usability prevent people from accessing and eventually adopting technology such as the Internet and e-Government [13].

Usability can be achieved in a project by following a user centered design (UCD) process [14]. The UCD process involves the end-user in an active and collaborative way [15]. Feedback from typical users at several stages of the project is a major part of the UCD process. Different usability methods exist and the appropriate methods should be used in different stages of the UCD process [14]. Focus groups, interviews, surveys and contextual observations are commonly used methods to conduct user research in early stages of product development [16, 17]. This study uses the established focus group method to obtain user information.

Usability First [18] defines a focus group as *a facilitator leads a small group of four to eight participants by demonstrating or showing them a product or concept*. The participants are encouraged to freely give their honest

opinions about the product including suggestions to improve the product. Nielsen [19] states that focus groups are a somewhat informal technique that can help to assess user needs and feelings both before interface design and long after implementation. Focus groups often bring out users' spontaneous reactions and ideas and allow for the observation of group dynamics and organisational issues [19].

The benefits of a focus group include [16, 20, 21]:

- Relatively fast, cheap and easy to assemble with rapid feedback from users;
- Good for getting rich data in participants' own words and developing deeper insights;
- Generates product possibilities that stakeholders may have missed; and
- People are able to build on one another's responses and come up with ideas they might not have thought of in a one-on-one interview.

Nielsen [19] states that “although focus groups can be a powerful tool in system development, you shouldn't use them as your only source of usability data.” It is important to note that other usability data will be collected throughout the entire project in the form of heuristic evaluations, cognitive walkthroughs and usability tests.

2.2. Usability and E-Government in the Provincial Government of the Western Cape

The South African Government has recognised the potential benefits of harnessing the power of ICT [22]. The South African Government has committed itself to provide information to all sectors of the population [23]. The problem is that African e-Government websites have a higher rate of failure than success [4]. Visiting South African government websites can be a frustrating experience [24]. Korsten and Bothma [23] compiled a government website audit where the findings demonstrated that there was a need for government websites to improve considerably with regard to content, information architecture, navigation, search and design. The South African Government did not have any direct policies or guidelines relating to web design and publishing at the time initial government websites were developed [23].

The PGWC supported the President's drive for e-Government by launching an Internet portal, www.capegateway.gov.za. Cape Gateway is a single point of access to government information and services for the citizens of the Western Cape. Cape Gateway is managed by the e-Government for Citizens (e-G4C) directorate in the PGWC.

3. PGWC case study design

The following section discusses the design of the case study. The necessary steps according to literature are provided as well as the explanation of how it was applied in the case study. The goals of the focus groups, user profiles, logistics and planning as well as the method are discussed.

3.1. Goals of the focus groups

The first step of a potential focus group exercise is to determine why and what is required [25, 26]:

Why is the focus group research being conducted? The primary goal of the focus groups is to get insights into the thoughts of typical users and stakeholders of the website for improvements to the current site and for development of the new/future site. The focus groups will also be used to start creating usability awareness in the organisation.

What will be learned from the focus groups? The facilitator will learn about the current problems on the current website, guidelines for the development of the future site and the needs and requirements of typical users and stakeholders.

What actions will be taken based on the results of these focus groups? Usability enhancements will be implemented on the current website. Several issues will be identified from the focus group data to include in the usability enhancements. The feedback given at the focus group will have an impact on the development of the information architecture and the wireframes for the future site. Process or content issues that arise will be reported to management and the content team.

3.2. User profiles

The identification of focus group participants is not a random selection, but is rather based on characteristics of the participants in relation to the artifact that is being discussed [20]. Representative participants need to be selected who match the desired users of the website. In this study, the focus groups included stakeholders as well as members of the community. The number of participants in this study ranged between four and 12 per focus group session. The following groups participated in the focus groups: e-Government for Citizens internal staff (the staff managing the portal); PGWC Call centre staff; PGWC Contact centre staff; Red Door Advice Centre's staff (provide administrative support to SMMEs); Red Door Advice Centres small business clients; Head of Communications of PGWC Departments and citizens of the Western Cape.

3.3. Logistics and planning

Research indicates that the following needs to be considered when planning for the focus groups: *facilitator; assistance; number of participants; length of the sessions; equipment required; documents required; pilot study, budget and timeline* [20, 21, 25, 27].

A focus group is run by a facilitator who maintains the group's focus [19]. The facilitator is the greatest single influence on the quality of information that is extracted from focus group research [25]. It is important to have a facilitator with focus group experience to effectively manage the session and obtain reliable data. The facilitator must generate interest in the topic, involve all the participants, keep the discussion on track (but also allow for unexpected diversions), keep dominant personalities from overwhelming other participants and not give away the sponsor's beliefs or expectations [16]. Incompetent facilitators may cause an ineffective session and skew the results. The e-G4C Usability Team Leader was the facilitator of the sessions. The facilitator requires assistance in order for that person to focus on the facilitating of the session. Using a note taker makes it easier for the facilitator to concentrate on the issues and questions at hand. It is recommended that a note taker with background knowledge of the project and/or usability experience is used. A usability contractor was used for note taking and assistance.

The number of recommended participants per group ranges marginally in literature: four to eight [18]; six to eight [21]; six to nine [19] and six to 12 [10]. The number of participants in this study ranged between four and 12 per focus group. A focus group typically lasts approximately two hours [19]. The sessions in this study ranged between 90 minutes and two hours. Equipment that should be considered includes the use of a video camera to record the session. Additional

equipment for this session included: a projector and laptop with Internet connection to show the website to participants; as well as a laptop for the note taker - it is easier and faster to type notes than to write them down.

Specific documents are required for a focus group [16, 20, 25]:

- **Planning document:** should be compiled where the need for the focus group is clearly defined and the planning items are listed;
- **Screening questionnaire:** needed to screen and recruit participants for the sessions;
- **Discussion guide:** has all the questions that need to be covered in the focus group;
- **Informed consent form:** lets participants know what their rights are; that they are not being tested, the system is being tested and that their data may be used anonymously in results and reports;
- **Analysis plan:** required on how the results will be analysed; and
- **Final report:** including the results and recommendations of the focus groups.

This study used a screening questionnaire for the citizens; not for internal stakeholders. Internal stakeholders already satisfied the criteria, where they needed to be, for example, a contact centre staff member or a Head of Communication for a Department. The screening questionnaire (hosted on Survey Monkey) for citizens was advertised on the website. Focus group facilitators generally follow a discussion guide (not included in this paper) that has the questions, prompts, tasks and exercises for the group [16, 26]. Participants were asked to describe examples of how and why they use the website. They were also asked about areas on the websites where they experience difficulty.

An informed consent form was given to participants to complete before the session started. An analysis plan was included in the planning document for this study. A final report with results was given to senior management for sign-off before the recommendations were implemented. An in-house pilot session is recommended to assist in making sure that questions are effective and that all steps and documents are in place [20]. The session with the e-G4C staff was seen as the pilot session for this study. These results were included in the study.

The budget for the research needs to be determined beforehand. Costs to consider are: recruitment of participants; the venue; participant incentives; equipment such as video cameras; refreshments; facilitator and assistants. Timelines need to be calculated to plan the different stages of the focus group, including: planning; recruitment; conducting the focus group sessions; analysis and the write-up of the document.

3.4. Method

The method used on the day of the focus group is explained next. Materials and equipment should be checked before the session to make sure that everything works. At the start of the session each project member should be introduced and an overview of the project should be given. Participants should also introduce themselves to the rest of the group. It is important to establish that the participants are helping to improve the website and that they are not being tested. Let participants know what to expect in terms of the type of questions, how they should be answered, the length of the session and that answers are confidential. The informed consent form should then be administered.

Once the welcoming formalities have been completed, the facilitator should run the session from the discussion guide. Questions were formatted as a general outline for each session; however, the session was conducted in such a way that if participants started talking about a point only to be asked about later, they were not stopped. The discussions were done as free flowing and informal as possible. An icons presentation was included to selected groups. This slideshow displayed icons used before 19 January 2011 on the website. Participants were asked to identify what each icon meant.

The following guidelines are recommended when asking the questions [17, 21]: be neutral and non-judgmental; restate and clarify early and often; if one participant tries to dominate the session, the moderator should invite each person to speak in turn; ask for concrete examples and stories; avoid blaming anyone and if the session goes off track, the facilitator may need to step in and refocus what the focus group is all about and lead it back on track.

The closing of the session should include the opportunity for participants to give final remarks and inputs. The data from the session should be written up as early as possible.

4. Results

This section discusses the significant results from the focus groups. The data should be analysed into general themes [17]. Table 1 lists the issues on the current website (issue followed by the recommendation or action taken). The themes were structured into the look and feel of the site, target audience and name of the site, content, links and naming, functionality and navigation. Table 2 lists the issues that were found for consideration for the implementation of the future website. These issues will be used as direct input into the wireframes for the new website. Wireframes depict the layout of the page, arrangement of website content, interface elements and navigation.

Table 1: Issues on current website

Look and feel	<i>Home page is old, static, boring:</i> A carousel has been implemented where several news stories are shown. There is movement on the website and more regular updated content/stories. <i>Icons are not effective:</i> The icons have been replaced with photos with a clear meaning.
Target audience and name of website	<i>The Western Cape aspect of the portal is not clearly emphasised:</i> “Western Cape” brought into the slogan; Western Cape government logo added. <i>Position of departments on website is too low:</i> The departments are one of the major stakeholders; their information has been moved towards the top in the form of a drop-down box.
Content	<i>Large sections of content are out of date:</i> A serious effort is required to update content. The content team is busy with an exercise to update certain parts of the website. Selected issues are listed next. <i>Names of previous staff member on contact us page:</i> It was decided not to have a specific person’s name on the contact us page. <i>Several empty/dead links:</i> This has been corrected. <i>Public participation documents must be more prominent:</i> Content team including such items as top stories.
Links and naming	<i>‘Publications’ is not a descriptive title:</i> Renamed to Documents. Usability studies will confirm if this is effective. <i>Red Door on home page not clear:</i> Renamed to ‘Red Door – Tender Advice Centres’; a mouse-over description also included.
Function-ality	<i>Advanced search is hidden:</i> The advanced search link has been moved to the search box area. <i>Drop-down menu displaying sub-levels:</i> Drop-down menus have been included to give the user an immediate view of what information to expect and to make navigation easier (see navigation).
Navigation	<i>Too many clicks and too steep a learning curve to find out where things are:</i> Drop-down menus have been included to give the user an immediate view of what information to expect. Ministries and Department drop-down boxes have been included.

The most important issue highlighted was that the content of the website was outdated. Content strategies and guidelines are currently under development to assist in achieving better and regularly updated content. Navigation was also a major issue and needed to be addressed in the current and future site. The current version now has drop-down menus allowing the user to see exactly what options are available as a part of each main menu item. Several words were renamed to improve navigation as well as understanding of the words. Participants could not identify the meaning of the icons on the homepage. The icons have been replaced with photos with a clear meaning. The goal of the wireframe exercise is to improve navigation significantly for the future website.

Table 2: Issues to address for new website

Look and feel	The carousel has increased user numbers and should be used for the future website. Users have given positive feedback about the new photos; photos should be used instead of icons.
Target audience and name of website	<i>The Western Cape aspect of the portal is not clearly emphasized: Site gets confused with Cape Gateway housing project and Cape Gate mall. A rebranding exercise is currently being conducted. A name change is being considered as part of this exercise. International users: Contact centre participants reported receiving queries from expats and foreigners (such as buying a house in SA, Marriage, Pension and Tenders). This audience should be considered as a target audience of the website.</i>
Content	<i>Large sections of content are out of date: All content should be approved and properly managed. A content strategy will guide content on the future website. Language Translation: The need for the website to feature in different languages came out in several focus group sessions. Glossary is needed in English, Afrikaans and Xhosa. Users don't distinguish between local and provincial government: The difference will need to be made clear. Municipalities are not adequately represented or grouped; for example, people are not finding the George municipality because it's listed under 'Eden District': The information should be presented in a clear way. Maps should be included when providing contact details to a physical location. Jobs: Request to submit CVs online.</i>
Links and naming	<i>The names: "Directories", "Your Life", "Publications" and "Topics" on the home page are not clear: These names should be investigated and appropriately named. Government jargon is confusing: glossary and mouse-over information should be given where government terms can be confusing. Not enough marketing is being done to make citizens aware of the website.</i>
Function-ality	Drop-down menu displaying sub-levels to ease navigation. <i>Search functionality: The current search functionality is not effective. A more effective search with tagged content should be implemented.</i>
Navigation	<i>Too many clicks and too steep a learning curve to find out where things are: The goal of the current wireframes exercise is to have navigation as easy and simple as possible.</i>
Other	There is a definite need for comment/feedback forms for suggestions. Social media possibilities need to be investigated.

5. Conclusion and future research

A focus group is a commonly used method to conduct user research in early stages of product development [16, 17]. The aim of this study was to conduct focus groups to obtain insights from users of the PGWC website and their typical tasks performed. This information would be utilised for the creation of the future website as well as the identification of usability problems on the current website. The focus groups proved to be a success as findings resulted in recommendations to enhance and improve the current website. The major changes to the current website included: a top story carousel for the home page to have more frequent and new stories; mega drop-down menus to improve navigation; senseless icons replaced with photos with meaning; department and ministry stakeholder information moved above the fold of the page and displayed in a clearer fashion and the renaming of several elements to be more comprehensible.

Website developers and usability practitioners in South African e-Government should take note of these results to avoid similar issues when developing websites. The focus groups results were also a major input into the information architecture and wireframes exercises for the future website. A more comprehensive idea of typical user tasks and needs was formed. After the completion of the information architecture and wireframes, as part of the UCD of the future website, the next steps will include website design, heuristic evaluations, interviews and usability testing.

Further, the contribution of this paper is to give enhanced focus group guidelines to usability practitioners in e-Government. This was the first time focus groups were used in e-G4C. Table 3 summarises and recommends the steps to use when conducting focus groups. These steps are combined methods of the literature listed in Section 2 and 3 as well as techniques used and lessons learnt in these focus groups. The main steps include: define the focus group goals; determine user profiles; plan the session; run the session; analyse, report and use the results. The ‘use the results’ step is included as one often finds that studies are conducted, the results are filed and improvements never implemented. The steps listed in Table 3 will be useful for future focus group studies in the PGWC e-Government environment. These steps as well as the results will also allow other provincial governments in South Africa to see how to conduct focus groups to improve their e-Government websites.

Organising focus groups within an organisation can be useful in getting buy-in to a project from within that company [21]. This was clearly visible from these focus groups as specifically internal stakeholders appreciated to be engaged in the exercise of improving PGWC websites. Future research will demonstrate how the use of focus groups assisted in creating usability awareness and buy-in in the PGWC. Further research is required around specific South African cultural aspects to consider when conducting focus groups. For example, in some cultures, making direct eye contact can be problematic, which presents special facilitator challenges. Future research will also include the use of other usability methods in e-Government as the focus groups were the start of a major UCD process.

Table 3: Overall checklist for the focus group

1. Define focus group goals	
<ul style="list-style-type: none"> • Why is the focus group research being conducted? • What will be learnt from the focus groups? • What actions will be taken based on the results of these focus groups? 	
2. Determine user profiles	
3. Plan the focus groups	
<ul style="list-style-type: none"> • Facilitator; • Assistance; 	<ul style="list-style-type: none"> • Equipment required; • Documents required;

<ul style="list-style-type: none"> • Number of participants; • Number and length of the sessions; 	<ul style="list-style-type: none"> • Pilot study; • Costs and budget; and • Timeline.
4. Run the session	
<p>Preparation before participants arrive:</p> <ul style="list-style-type: none"> • Check that the room is available; and • Make sure you have all materials to be handed out. <p>The session:</p> <ul style="list-style-type: none"> • Introduce project members; • Give an overview of the project; • Establish that the participants are helping you; • Let participants know what to expect: Type of questions; length of the session; it is not a test; confidentiality; • Let participants introduce themselves; • Answer related question they may have; • Let participants sign informed consent forms; and • Facilitator runs the session from the discussion guide. <p>Closing:</p> <ul style="list-style-type: none"> • Indicate that all the questions have been covered; • Ask if there are any final comments/questions; • Emphasise confidentiality; and • Ask if the participant would like to be included in future workshops. 	
5. Analyse the results	
<ul style="list-style-type: none"> • Write up the session as soon as possible; • Include what participant said, not just the interpretation; and • Guidelines for themes: look and feel of the site, target audience and name of the site, content, links and naming, functionality and navigation. 	
6. Report the results	
7. Use the results	

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Appendix K: 12th European Conference on E-Government Paper (2012)

The South African User Experience Maturity Status for Website Design in Provincial Governments

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Abstract: The growth in Africa's Internet and broadband sector has significantly increased in recent years, specifically in the e-Government sector. The Internet has become a crucial tool to disseminate information to citizens, but poorly designed websites can drive a wedge between a government and its citizens. Designing a user friendly and functional provincial government website is a challenging task. A website that is difficult to navigate and does not meet the user's needs and requirements increases the task difficulty and complexity. The lack of user-centered design methodologies and poor usability of government websites are major obstacles in several countries. The consensus amongst researchers is that usability is an important factor in designing e-Government websites; however, there is some disagreement as to the extent that usability has been achieved in the majority of e-Government websites. African e-Government websites generally have higher failure rates and usability problems. In South Africa, the government did not have any direct policies or guidelines relating to website design initially. Today a number of guidelines and principles exist for e-Government website design; however, there are limited indications that these principles and guidelines are being applied by South African Provincial Government website designers. These guidelines can further not be implemented if there is no executive support, adequately trained staff, budget or the use of usability methodologies and user-centered design processes. There is a need to measure how well organisations conduct usability and UX in their organisations (Earthy, 1998).

The research question addressed in this paper is: *What is the maturity of usability and user experience (UX) in South African Provincial Governments?* A survey was conducted amongst stakeholders in each of the nine Provinces in South Africa. The goal of the survey was to determine the usability and UX maturity of each of the Provinces. The results of the study indicates a lack of usability and UX processes in South African Provincial Governments and the limited use of a standardised user-centered design methodology. Usability and UX are not an established best practice or standard in South African National, Provincial or Local Governments. The results further highlight the need for a methodology to institutionalise usability and UX in the nine Provincial Governments. The results of this study will be of value in South African and emerging market Provincial Government environments. The recommendations have implications for government officials, information technologists, website designers, usability evaluators and e-Government website designers.

Keywords: Usability; User experience; e-Government; Provincial Government; UX Maturity Models.

1. Introduction

Governments around the world are leveraging advances in Information and Communications Technology (ICT) to enhance their service delivery mechanism and to improve citizen interaction and satisfaction towards government (Berman, Angula, Khan and Madisha, 2010). Straub and Gerrol (2008) indicate that "*Putting government online is one thing; making government websites functional and easy to use is quite another*". A government website should be designed from the public's point of view (Eggers, 2005). Governments generally are seen to be behind the Web technology curve (Straub and Gerrol, 2008). Users interacting with government websites often experience that not enough has been done to anticipate their needs or make information easy available and locateable (Straub and Gerrol, 2008). The user experience with governmental websites does not compare well with the online experiences that citizens have in the private sector.

User experience (UX) is the new differentiator in customer service (Straub, Patel, Bublitz and Broch, 2009). Service is key to customer satisfaction in face-to-face environments; however, customer satisfaction in the Internet age focuses on user-centered design. Designing websites that customers can easily learn and

confidently use, leads to improved customer satisfaction and increased loyalty (Straub et al., 2009). Usability is an important factor in designing e-Government websites (Berman et al., 2010). In the United States, the importance of usability in government has grown and is considered a best practice (Usability.gov, 2011). Usability and the use of user-centered design methodologies are not presently a standard or best practices in South African Provincial Governments. Several usability and design guidelines exist which are applicable to the South African Government website designers. There are limited signs of utilisation (Berman, et al., 2010; Yeratziotis, 2008).

A possible problem is the lack of knowledge of usability guidelines at various levels of government. Organisations typically progress through a sequence of stages as their usability processes evolve and mature (Nielsen, 2006). Usability and UX maturity models allow one to assess the degree of capability reached by an organisation and its ability to perform human-centred design activities (Earthy, 1999). The goal of this research study was to determine *the maturity of usability and UX in South African Provincial Governments*. A survey was conducted amongst stakeholders responsible for the websites of each of the nine South African Provincial Governments.

In this paper, Section 2 discusses the literature on usability and UX and provides the background for maturity models and a discussion of South African Provincial Government websites. Section 3 describes the methodology and survey used and in Section 4 the results are presented. Section 5 discusses the results and findings and Section 6 reflects on the contribution of this paper and concludes with suggestions for future work.

2. Background

2.1 Usability and User Experience

Usability is a quality attribute relating to how easy something is to use and in ICT specifically refers to how quickly people can learn to use something, how efficient they are whilst using it, how memorable it is, how error-prone it is and how much users like using it (Nielsen and Loranger, 2006). In 1994 usability was described as being concerned with gathering data about the usability of a design or product by a specific group of users for a particular activity within a specified group of uses or work context (Preece, Rogers, Sharp, Benyon, Holland and Carey, 1994). In 2007 this description was expanded to include the user experience by stating that usability included both the usability of a system, e.g. how effective, efficient, safe and learnable it is as well as the users' experience when interacting with the system, e.g. how satisfying, enjoyable, or motivating the interaction is (Preece, Rogers and Sharp, 2007). Usability evaluation further needs to accommodate the safety and learnability of a system and the subjective user experience is emphasised (Poppe, Rienks and Van Dijk, 2007).

Tullis and Albert (2008) state that usability is usually considered as the ability of the user to use something to carry out a task successfully. UX takes a broader view, looking at the individual's entire interaction with a system, as well as the thoughts, feelings and perceptions that result from the interaction (Tullis and Albert, 2008). The differentiating factor from traditional usability research is a wider end goal: not just achieving effectiveness, efficiency and satisfaction, but optimising the complete user experience from expectation through actual interaction to reflection of the experience (Bevan, 2009).

2.2 Usability and UX Maturity Models

Research initially measured how well organisations conducted the human-centred part of system development (Earthy, 1998); however a number of dimensions exist in usability engineering maturity (Schaffer, 2004). A usability and UX scale assists professionals who wish to improve their organisation's performance of human-centred activities (Earthy, 1998). An organisation with a low rating is unlikely to implement the processes necessary to bring about the highest levels of maturity. However, a scale will help an organisation to understand the benefits of the different levels of maturity and will assist with how they can evaluate their current position and advance to higher levels.

Usability models generally integrate the following components (Schaffer, 2004; Straub, Patel, Bublitz and Broch, 2009):

- *An executive champion*: An executive who has made a clear and visible commitment to promoting usability throughout the organisation (including educating employees, funding and removing obstacles);
- *User interface standards*: Design standards to define the layout and flow of websites;
- *Professional staff*: Team members should represent multi-disciplinary skills that includes psychologists and researchers, team members with experience in human factors engineering, interaction design and visual design. Team members should have formal usability training;
- *Tools*: All individuals who are tasked with interface design should have open access to a common set of resources to educate and support best practices in interface design. The toolset should include reusable artifacts that practitioners can employ to streamline their work;
- *Training*: Individuals at different levels within organisations need to understand information about usability. Practitioners need ongoing, advanced training on emerging methods, evolving best practices and current trends across industries;
- *Showcase projects*: Showcase projects are high-visibility projects that receive support and recognition throughout the organisation. Mature programs create and distribute case studies to recognise, validate, and disseminate the successes of the usability group;
- *Enterprise Knowledge Management*: A usability knowledge management system should be the single, central repository for all resources and artifacts related to usability and the practice of usability within an organisation. Usability groups aggregate and share their charter, strategy, standards, reusable research and design artifacts (e.g., personas, graphics library) in a common location; and
- *Digital UX Strategy*: Mature usability organisations have a clear, actionable digital UX Strategy that identifies touch points and synergies of usability across the inward and outward-facing customer communication systems.

Organisations typically progress through a sequence of stages as their usability processes evolve and mature (Nielsen, 2006). The sequence is fairly universal, allowing organisations to match their current stage of usability and to identify their next or future stage (Nielsen, 2006). Nielsen (2006) lists eight stages of corporate usability maturity:

- Stage 1: Hostility towards usability;
- Stage 2: Developer-centered usability;
- Stage 3: Skunkworks usability;
- Stage 4: Dedicated usability budget;
- Stage 5: Managed usability;
- Stage 6: Systematic usability process;
- Stage 7: Integrated user-centered design; and
- Stage 8: User-driven corporation.

The *Nielsen usability maturity model* starts with an organisation being hostile to usability (Stage 1) where developers simply do not consider users or their needs. The model progresses up to the final stage (Stage 8) where an organisation is user-driven and conducts user research to determine its overall direction and priorities.

Earthy (1998) developed a model to determine the level of maturity reached by an organisation in its capability to do human-centred design. The model was developed in order to clarify the nature of organisational maturity with regard to human-centredness and its implications for system maturity modelling. Schaffer (2004) adopted the Earthy model to identify an organisation's usability maturity.

The six levels of the *Schaffer usability maturity model* are as follows:

- Level 0: Clueless;
- Level 1: Piecemeal usability;
- Level 2: Managed usability;
- Level 3: Infrastructure;
- Level 4: Staffing; and
- Level 5: Routine usability.

The levels reflect the progression of concerns and practices observed in organisations which adopt a human-centred approach to systems development and management and are the typical levels companies progress through (Schaffer, 2004). The model starts with an organisation being clueless (Level 0), where an organisation is unaware of usability as a formal discipline. The model progresses to the final level where usability is a routine practice and has been institutionalised (Schaffer, 2004).

The usability models have been refined and new UX models have been developed. Temkin and Geller (2008) defined five stages of *customer-based differentiation maturity*. Feijo (2010) adopted this model to reflect a six step *Feijo UX Maturity Model* (Figure 1). The model starts with an organisation not recognising UX (Level 1) and progresses up to the level where UX is fully embedded in an organisation (Level 6).



Figure 1: Feijo's (2010) User Experience Maturity Model

The maturity models discussed above will be utilised in the survey (Section 3.3) to determine the usability and UX maturity of Provincial Governments in South Africa. The next section discusses South African e-Government websites.

2.3 South African e-Government Websites

The growth in Africa's Internet and Broadband sector has accelerated in recent years (World Wide Worx, 2011) and this growth could be used as a critical tool by a government in the form of e-Government (Yeratziotis, 2008). E-Government (electronic government) is the use of ICT to provide more efficient government services, empower citizens through access to information and facilitate communication between government and the community (Chango, 2007; Yeratziotis, 2008).

Although the development of e-Government is proceeding at a tremendous pace in the developed world, the same cannot be said of Africa's experiences with e-Government (Blessing and NtombovKlass, 2009). African e-Government websites have a higher rate of failure than success (Chango, 2007). Africa continues to perform below the world average in the United Nations e-Government Survey (2010), given that most of the world's least developed countries are in this region and generally lack the financial and human resources to fully implement e-Government. Tunisia leads Africa in e-Government development, followed by Mauritius and Egypt. South Africa is ranked in fourth position in Africa and 97th worldwide.

The Internet has become a crucial tool to disseminate information to citizens, but poorly designed websites can drive a wedge between government and the people (Bailey, 2002). Accessing South African government websites can be a frustrating experience (Vermeulen, 2010). The South African Government has recognised the potential benefits of ICT (Korsten and Bothman, 2005) and has committed itself to provide information to all sectors of the population (Bridges.org, 2003).

Usability is an important factor in designing e-Government websites; however, there is some disagreement as to the extent that usability has been achieved in the majority of e-Government websites (Berman et al., 2010). It can be argued that without addressing usability at a detailed level in e-Government website design, e-Government still retains the challenging target of how best to interact with users (Baker, 2009; Huang, 2010). Further, it is fundamental to create e-Government websites that are usable and representative of the social and cultural backgrounds of South African citizens (Yeratziotis, 2008).

In the United States the importance of usability in government has grown and is considered a best practice (Usability.gov, 2011). Usability guidelines for e-Government websites exist (Berman, et al., 2010; Yeratziotis, 2008), however there are very few signs that indicate that South African Provincial Governments (PG) have applied these guidelines on existing sites. Korsten and Bothma (2005) compiled a South African Government website audit where the findings indicated that there was a need for government websites to improve considerably with regard to content, information architecture, navigation, search and design. Continuous scientific usability engineering practices were not followed during the development of South African Government websites (Korsten and Bothma, 2005).

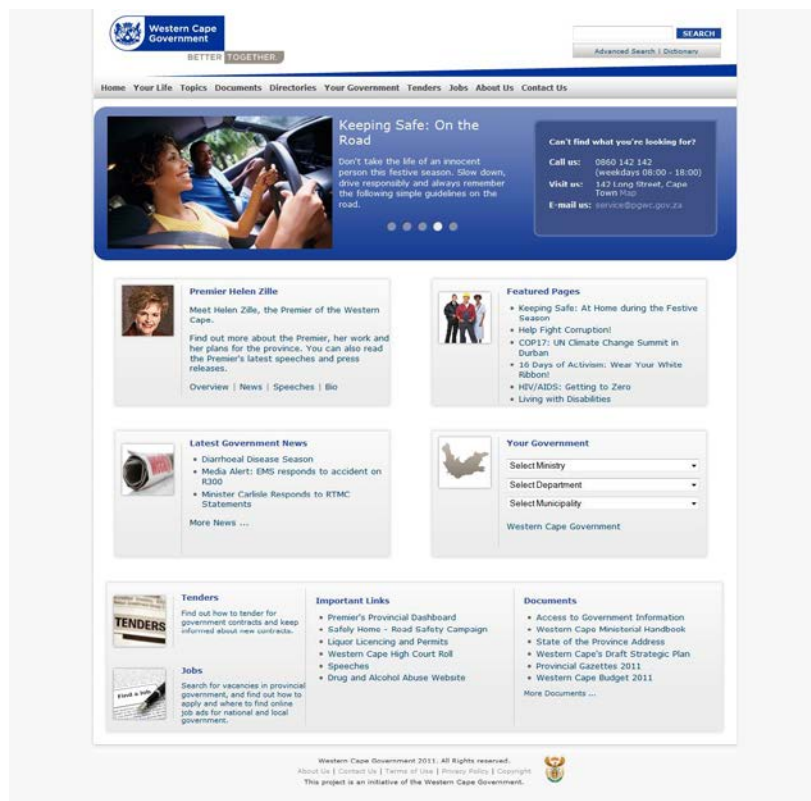


Figure 2: The Homepage of the Western Cape Government (www.westerncape.gov.za) (As on 04 January,2012)

The South African Government did not have any direct policies or guidelines relating to web design when initial government websites were developed (Korsten and Bothma, 2005). Currently the problems are the lack of understanding and buy-in of usability at various levels of Government and individual authorities do not necessarily have the experience or infrastructure to develop websites that are usable and that can be maintained as content changes (Soufi and Maguire, 2007).

The Western Cape Government is a PG in South Africa and their website, is one of the South African websites that has utilised usability guidelines the past year (Figure 2). In contrast, the North West PG

website violates several usability and design guidelines (Figure 3). The contents are outdated; images are stretched; poor background and text contrast are evident and several pages are below the fold. A usability and UX process and methodology would greatly assist this PG to improve their website. The method and survey used in this study is discussed in the next section.



Figure 3: The Homepage of the North West Provincial Government (www.nwpg.gov.za) (As on 04 January, 2012)

3. Method

3.1 Participant Profile

The participant profile of this study was aimed at the nine Provincial Governments (PG) in South Africa. Table 1 lists the nine PGs together with their website addresses. Section 3.2 describes how the participants were recruited. The participants consisted of direct stakeholders of the government websites, such as Directors, Web Content Managers and Web managers.

Table 1: South African Provincial Government Websites

Provincial Governments	Websites
Western Cape	www.westerncape.gov.za
Gauteng	www.gautengonline.gov.za
Free State	www.fs.gov.za
Eastern Cape	www.ecprov.gov.za
Kwazulu-Natal	www.kznonline.gov.za
Limpopo	www.limpopo.gov.za
Mpumalanga	www.mpumalanga.gov.za
Northern Cape	www.northern-cape.gov.za
North West	www.nwpg.gov.za

3.2 Data Collection Method

An electronic survey (Section 3.3) was sent to each of the nine PGs. Participants were requested to participate in the survey and were given the opportunity to ask any questions they may have regarding the

survey. Initially, in order to find the appropriate contacts or participants for each website, the website of each PG was searched for appropriate contact persons. It was a challenge for the authors to find contact details of the website custodians, webmasters, content managers or IT Department on the websites. Only three PGs responded through this method and provided contact details of the responsible person to contact.

The South African National Department of Government Communication and Information System (GCIS) were subsequently contacted and they provided a list of Web Content Managers for each PG website. If a PG had a global website contact, the request to complete the survey was sent to the identified individual. If a PG did not have a global website contact, the request was sent to the Department of the Premier in each PG.

3.3 The Survey

The goal of the survey was to determine the maturity of usability and UX in South African PGs. The survey consisted of five sections, namely:

- Section 1: *Demographic information*. The staff members' PG, Directorate and job title;
- Section 2: *Nielsen's (2006) Usability Maturity model* (Discussed in Section 2.3);
- Section 3: *Schaffer's (2004) Usability Maturity model* (Discussed in Section 2.3);
- Section 4: *Feijo's (2010) UX Maturity model* (Discussed in Section 2.3); and
- Section 5: *UX Generic questions*. The questions were based on UX maturity questions from Human Factors International (2011), Ide-Smith (2011) and Straub et al. (2009). The questions are listed in Table 2 (Section 4). The list of questions also included a list of usability and UX methods where participants were required to select those they have utilised.

The Nielsen and Schaffer models had several sub-points in the survey to explain the details of each step to participants. Feijo's model was given to participants in a similar fashion as indicated in Figure 1. The results and findings of the survey are discussed in the next section.

4. Results and Findings

The results of the survey sections, listed in Section 3.3, are reported next.

4.1 Nielsen Usability Maturity Model

The *Nielsen usability maturity model* (Section 2.2) consists of eight stages (Stage 1: hostility towards usability; Stage 8: user-driven corporation). Figure 4 illustrates how South African PGs rated on the Nielsen scale. The lowest rating was for the Gauteng, Eastern Cape, Limpopo, North Cape and North West PGs, stage 2; while the highest rating was for the Western Cape Government, stage 5.

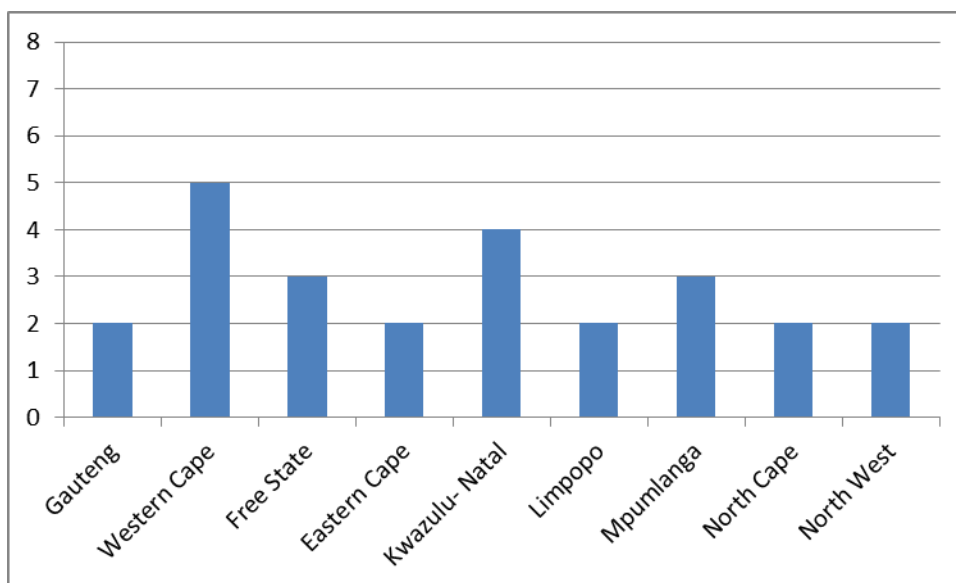


Figure 4: South African Provincial Government Results on the Nielsen (2006) Model
4.2 Schaffer Usability Maturity Model

The *Schaffer usability maturity model* (Section 2.2) consists of six stages (Level 0: clueless; Level 5: routine usability). Figure 5 illustrates how South African PGs rated on the Schaffer scale. The lowest rating was for the Free State PG, level 0; while the highest rating was for Gauteng, Western Cape, Kwazulu-Natal and Mpumalanga PGs, level 2.

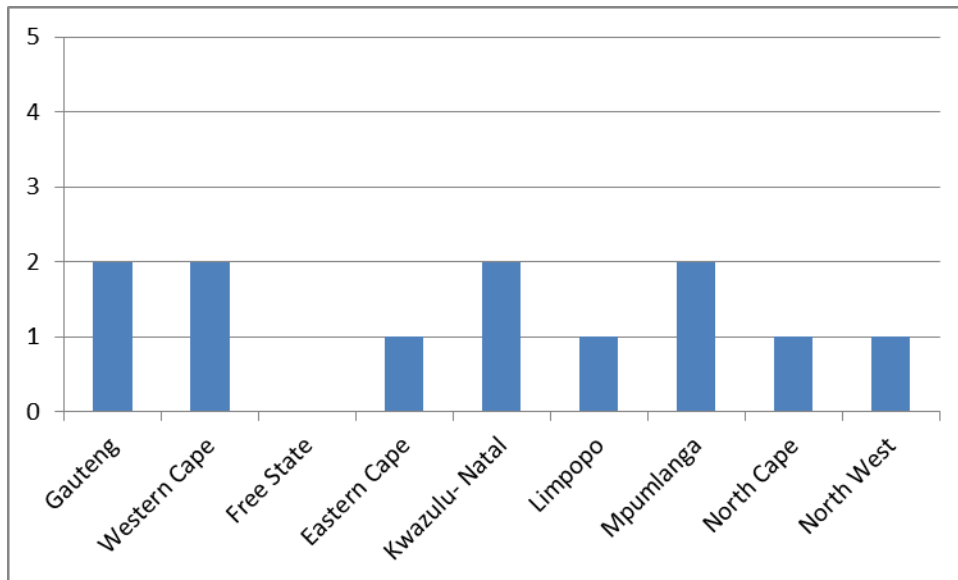


Figure 5: South African Provincial Government Results on the Schaffer (2004) Model

4.3 Feijo UX maturity model

The *Feijo UX maturity model* (Section 2.2) consists of six stages (Level 1: unrecognised; Level 6: embedded). Figure 6 illustrates how South African PGs rated on the Feijo scale. The lowest rating was for the Free State, Eastern Cape, Kwazulu-Natal, Limpopo, Mpumalanga, North Cape and North West PGs, level 2; while the highest rating was for the Gauteng and the Western Cape PGs, level 3.

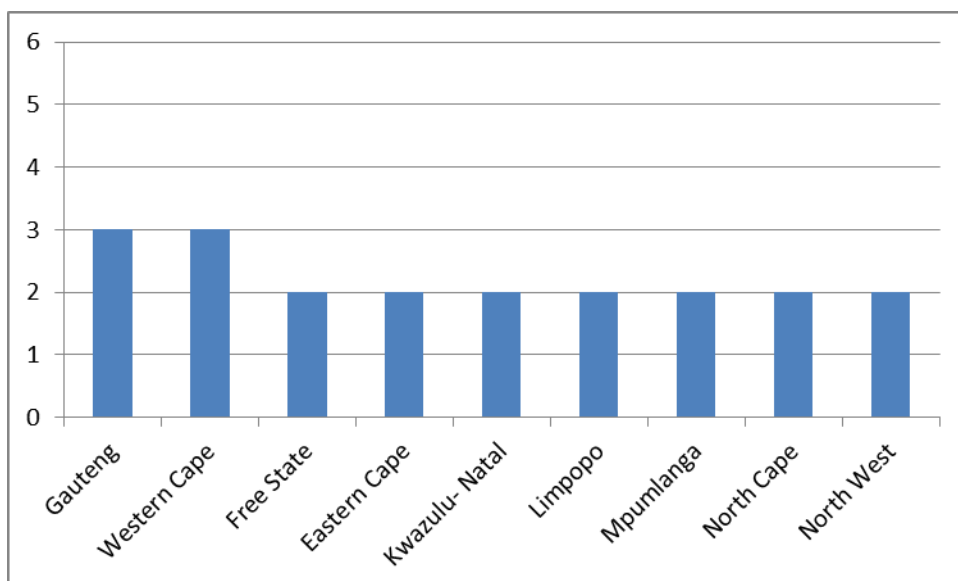


Figure 6: South African Provincial Government Results on the Feijo (2010) Model

4.4 UX generic questions

The survey concluded with a list of UX generic questions (listed in Table 2) compiled from UX maturity questions (Straub et al., 2009; Human Factors International, 2011; Ide-Smith, 2011).

Table 2: User Experience Generic Questions Results

Questions	Yes	No
Do you have usability and UX employees in your organisation?	4	5
Is usability and UX Design recognised as a unique and valued skill?	3	6
Do you have executive support?	4	5
Do you have a usability/UX strategy?	0	9
Is usability and UX a part of your development lifecycle (website)?	1	8
Is usability and UX exposure / training available to UX employees?	2	7
Is usability and UX exposure / training available to other employees?	1	8

The results of the questions indicated a lack of UX maturity in South African PGs, especially as five PGs do not have UX employees in the organisation and no PG has a UX strategy.

A checklist of UX methods was given to participants to select what UX methods they have used before. The most used UX methods were the following:

- Brainstorming;
- Benchmarking;
- Consistency inspection;
- Design guidelines;
- Guidelines checklist;
- Interface and Interaction design;
- Prototyping;
- Requirements gathering;
- Stakeholder meeting; and
- Writing for the Web.

Section 5 discusses the results reported in this section.

5. Discussion of Results

This study used three maturity models to rate the usability and UX maturity of PGs in South Africa. Table 3 displays the lowest and highest ratings on each maturity model.

Table 3: Lowest and Highest Rating Results on the Three User Experience Maturity Models

Model	Lowest rating	Highest rating
Nielsen (Stage 1 - 8)	2	5
Schaffer (Level 0 - 5)	0	2
Feijo (Level 1 - 6)	2	3

The maturity model results in Table 3 indicate that usability and UX are not yet mature in South African PGs. PGs did not achieve high levels in the usability maturity models. These results were validated and supported by the list of UX generic questions. Six PGs noted that usability and UX are not recognised as a valued skill. Only four PGs have UX employees in their organisation. None of the PGs have a usability or UX strategy in place and only one PG has UX in their development lifecycle.

Section 4.4. listed the UX methods currently used by PGs. Ide-Smith (2011B) describes the most effective UX methods and techniques (as found in a research study) as the following (the number in brackets indicate the number of PGs who reported to be using these methods):

- Participatory design (2);
- Expert reviews (1);

- Prototyping (5);
- Interviews (3);
- Wireframes (3);
- Personas (2);
- Contextual enquiry (1);
- Usability testing (3); and
- Sketching (1).

The most used methods by the PGs (Section 4.4) does not correspond well with this list, with only the prototyping method in both lists. The combined results of the maturity models and the UX questions indicate that the status of UX Maturity for website design in South African PGs are at a very low level.

6. Conclusions and Future Work

Governments worldwide have made significant attempts to publicise information and services offered on the Internet (Kumar, Mukerji, Butt and Persaud, 2007). An e-Government website is a key priority for governments when they develop their e-Government systems (Huang, 2010). Poor usability of government websites is a major obstacle in several countries (Wangpipatwong, Chutimaskul and Papisatorn, 2008).

UX design refers to making products and services that are not only usable but also useful and appealing (Schaffer, 2004). Properly applying usability and UX concepts and processes can help a government agency achieve a measurable return on its online investment and realise the full benefits of the digital age (Straub and Gerrol, 2008). There is a need to measure how well organisations conduct usability and UX in their organisations (Earthy, 1998). Usability and UX maturity models allow an organisation to measure their current status and to identify the status at which they wish to be. Three models were identified in this study (Earthy, 1998; Schaffer, 2004; Feijo, 2010).

The South African Government has recognised the potential benefits of harnessing the power of ICT (Korsten and Bothman, 2005). South Africa has nine Provincial Governments each with its own e-Government website. A number of web design and usability guidelines exist for South African e-Government websites; however, there are limited signs of guidelines being successfully implemented. It is challenging to implement these guidelines if there are no usability methodologies, executive buy-in, staff, budget or user-centered design processes.

The maturity model results indicated that usability and UX are not yet mature in South African PGs. The majority of PGs were rated very low in the maturity models. The PG with the highest rating in each model, had at least three levels to progress before reaching the top step of each maturity model. These results were validated and supported by the list of UX generic questions: six do not recognise usability and UX as a valued skill; only four PGs have UX employees; no PGs have usability or UX strategies in place and only one PG has UX forming part of their development lifecycle.

HFI's 2009 UX Maturity Survey (Straub, Patel, Bublitz and Broch, 2009) indicates that stable, visible, internal usability and UX groups with executive support have become significantly more prevalent since Schaffer (2004) outlined the elements of a mature usability/UX practice. However, the results show that this statement does not hold true for South African PGs. Usability and UX are not at a mature stage yet. It is impossible to take an organisation from UX indifference to UX maturity (Ide-Smith, 2011B). Professionals should focus on big change through small victories by convincing the team of the need for UX approaches (Ide-Smith, 2011B). Current research includes the validation of these results by investigating the UX maturity of one South African PG (Western Cape Government) in more detail.

Models exist on how to institutionalise usability and UX in organisations (Schaffer, 2004). Current research investigates how to institutionalise usability and UX in a PG in South Africa. A methodology will be proposed to assist PGs to institutionalise usability and improve website design. Future research includes the application of this methodology internationally.

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The Development of a Usability Methodology Incorporating Eye Tracking for Developing Countries

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Keywords: Usability methodologies, eye tracking, user interfaces.

ABSTRACT

Companies are increasingly making use of usability techniques to evaluate computer software and e-commerce applications. Managers are becoming aware of the different interaction techniques with computer applications and the individual needs of users with different education and cultural backgrounds. Eye tracking is increasingly being utilised as a supplementary method in usability evaluations and the usability testing of software applications. Eye movement data and eye fixations can supplement the data obtained through usability testing by providing more specific information on the user's visual attention. In the South African context, eye tracking is a relatively new field. Universities are investing in eye tracking technologies and businesses are increasingly utilising the expertise and services. There is an increasing need for usability methods combined with eye tracking to be utilised by practitioners and researchers in Southern Africa.

In developing countries, the computer and internet skills of users vary considerably and influence the user's ability to use interactive computer applications. In addition, cultural differences and language differences further influence a user's computer abilities. Usability research methodologies generally do not cater for users with different educational and cultural backgrounds. This study developed a usability methodology incorporating eye tracking that was suitable for the proposed research. The research followed a combination of case-study and action research. Three case studies were conducted, evaluating the usability of e-commerce applications by people from different cultural groups, including expert and non-expert participants. After each study the usability methodology was evaluated, updated and improved.

The contribution of this paper is to present a usability methodology for usability and eye tracking studies in the Southern African context taking the user's educational and cultural background, for example home language and computer expertise, into consideration. The study used participants from different cultural backgrounds and fourteen different language groups. The findings indicate that researchers must take the participants' cultural background into consideration and provide additional assistance during usability evaluations. The recommendations have significant implications for managers, information technologists, educators, website designers and usability evaluators.

Keywords: Usability methodologies, eye tracking, user interfaces.

INTRODUCTION

Businesses in Southern Africa are increasingly becoming reliant on computer software applications and are further developing e-commerce applications to remain competitive. The users of the e-commerce applications have different educational backgrounds and computer and internet experience. The users of the applications interact differently with the software applications due to their personal background and previous computer experience and knowledge. Managers in South Africa are increasingly realising the importance of usability evaluations of software and internet applications and marketing material (Savage, 2008).

The trend of using eye tracking as a supplementary method in usability testing is pursued internationally. Research has shown that incorporating eye tracking in usability research can provide positive benefits compared with traditional usability testing (Tobii Technology, 2009). Eye tracking is a relatively new field in Southern Africa, with the first eye tracking research in South Africa starting in 2004 at the Nelson Mandela Metropolitan University in Port Elizabeth. The use of eye trackers for usability research in South African universities is increasing. Industry is realising the potential and benefits of eye tracking in usability research, with companies purchasing their own eye trackers as well as consulting usability and eye tracking experts. A need has arisen for a suitable usability methodology that can be combined with eye tracking to be used by usability practitioners and researchers in Southern Africa. The goal of this paper is to provide a methodology for usability research incorporating eye tracking to be utilised in a South African environment.

In addition, Southern Africa has users with different cultural backgrounds (South Africa itself having 11 official languages), with a large portion of the population not being computer literate. In developing countries such as South Africa, the computer and internet skills of users vary

significantly, and this influences the user's ability to use interactive computer systems (Jason, 2008). Software systems and websites that have users with a typical South African profile will have several non-expert users. It is therefore important to consider the implications of expert and non-expert (beginners, novices, intermediates) users for usability testing and to include the recruitment of such users in a usability methodology.

A usability methodology to be used in the Southern African context must take the different educational and cultural backgrounds of the users into consideration. The preparation for the usability study; how to conduct the usability and eye tracking process during the usability test; and the type of post-test questionnaires to be used must further be adopted for the different user backgrounds.

Three usability studies were conducted in this study in order to develop and evaluate the proposed usability methodology, which included formal laboratory testing, eye tracking and post-test questionnaires. The first study investigated the usability of an assignment submission: *Learning management system*; the second study focused on the usability of a *university information portal*; while the third study examined the usability of an online *university library system*. The proposed usability methodology is a result of an initial methodology being compiled and improved with each study after lessons learnt have been incorporated. The contribution of this paper is to present a proposed methodology for usability and eye tracking studies in the South African context, taking into account the computer experience and the cultural background, such as the home language of the participant.

The paper is organised as follows: section 2 describes the problem being investigated and section 3 the research objectives and methodology. Section 4 provides the theoretical background on usability and eye tracking, as well as the difference between expert and non-expert users. Section 5 explains usability and eye tracking methodologies and techniques from literature. Section 5 also discusses the usability and eye tracking methodologies used in three studies. Section 6 proposes a usability methodology for usability and eye tracking studies in the South African context. Section 7 concludes and contextualises the findings and provides suggestions for future research.

THE PROBLEM INVESTIGATED IN THIS RESEARCH STUDY

The problem researched in this study is based on the usability research conducted internationally. International usability studies generally utilise users that have a higher standard of education and extensive computer experience. In South Africa, the general population has a diverse educational

background and limited computer experience. Usability study methodologies must take novice (referred to as non-experts in this study) as well as expert users into consideration (Jason, 2008). This study investigates usability methodologies that incorporate eye tracking and evaluates and combines a number of usability methodologies into a single usability methodology. The proposed methodology is evaluated using three case studies, and an improved usability methodology is proposed to be utilised in a Southern African context. The home language of the participants in the three studies included: Afrikaans; English; French; Setswana; Shona; Yoruba; Sepedi; Tsivenda; Zulu; IsiNdebele; isiXhosa; SiSwati; Sesotho and Xitsonga.

RESEARCH OBJECTIVES AND RESEARCH METHODOLOGY

The research objectives of this study were to:

- identify a suitable usability methodology that could be utilised in a Southern African context;
- adopt the usability methodology with the aid of three case studies using action research; and
- propose an updated usability methodology for people with different computer skills and cultural backgrounds.

The research methodology follows a combination of a case-study approach and action research. Case studies emphasise the detailed analysis of a limited number of events or conditions and their relationships (Vosloo, 2004). Yin (2003) indicates that case-study research is not only a data collection approach or design feature, but that it does represent a comprehensive research strategy. Flyvbjerg (2006:229) emphasises that the researcher should be sensitive to the diversity of the cases, which is specifically important in this study, where people from different educational and cultural backgrounds were involved.

The action research spiral is an iterative process of “diagnosing, planning, taking action and evaluating” (Saunders *et al.*, 2009:147). Action research starts with a clear purpose. In this study the purpose was to adapt a usability methodology, taking users from different cultural groups into consideration. This is followed by diagnostics (fact finding), planning and decisions about the actions to be undertaken. The action research process focuses on change, taking action and evaluating (Saunders *et al.*, 2009:148). This process was followed by utilising the three case studies discussed in section 5.

LITERATURE REVIEW

Section 4.1 discusses usability evaluation, focusing on eye tracking as the main method utilised in this study. Section 4.2 reviews previous work done in evaluating computer user interfaces with expert and non-expert users.

Usability and eye tracking

Usability testing involves measuring the performance of users on tasks with regard to the ease of use, the task completion time and the user's perception of the experience of the software application (Preece *et al.*, 2002). Usability testing quantifies users' performance in terms of errors made and time to complete the performance, while user satisfaction questionnaires and interviews are used to elicit user opinions (Preece *et al.*, 2002). In 2007 this description was expanded to include the user experience by stating that usability included both the usability of the system, e.g. how effective, efficient, safe and learnable it is, and the users' experience when interacting with the system, e.g. how satisfying, enjoyable, or motivating the interaction is (Preece *et al.*, 2007). Formal usability testing is an empirical method that requires the design of a formal usability experiment that is carried out under controlled conditions. Usability testing can be conducted within a usability laboratory or by means of field observations. The usability evaluations for this research were conducted by means of a formal usability evaluation.

Usability testing is increasingly being combined with eye tracking evaluations. Eye tracking is based on the fact that a record of a person's eye movements while completing a task provides information about the nature, sequence and timing of the cognitive operations that took place while the person was performing a task (Rudmann *et al.*, 2003). Eye tracking can be defined as a technique used to record and measure eye movements (Tobii Technology, 2010). The human eye moves by alternating between saccades and fixations. A saccade is the quick movement of the eye in order to shift focus from one area to the next. A fixation is the time spent looking at the newly found area. An eye tracker follows the eye during its saccades and tracks the location of the fixation points. Software designers can gain useful information on human eye movements by tracking eye saccades and fixations.

In Human-Computer Interaction (HCI), eye tracking has been used to study the usability of web pages (Jacob & Karn, 2003; Savage, 2008), menu searching, information searching from web pages and search result evaluation (Aula *et al.*, 2005). Goldberg and Kotval (1999) propose several eye tracking measures when evaluating a computer user interface. The authors state that eye movements

can drastically improve the inspection of users' strategies while using computer interfaces. Section 5 discusses different usability and eye tracking methodologies and techniques used by several authors.

Expert and non-expert users

Research has indicated that the skills and expertise of users utilising computer user interfaces differ significantly between computer experts and non-experts (Hurst *et al.*, 2007). In developing countries the difference between computer experts and non-experts is more noticeable, as many users lack basic computer skills. Research conducted by Jason (2008) has shown that the user's level of computer expertise influences the usability of computer applications. Pretorius *et al.* (2009) highlighted the influence of user skills and experience on the usability of websites and computer applications.

Different empirical definitions of expert and non-expert users exist, but two (strongly overlapping) criteria used for the differentiation between expert and non-expert users are the knowledge of and the time spent working with a particular user interface of a computer system (Prumper *et al.*, 1991). Given that expertise not only depends on the time spent working with or on a computer system, the term *non-expert* rather than *novice user* is used. Furthermore, the term non-expert is useful for grouping categories such as novice users and intermediate users; both are generally classified as non-expert users.

Miliszewska (2008) states that general ICT skills can be grouped into two categories:

- the use of software and hardware tools (Windows, word processing, spreadsheet applications, presentation software, database applications, web applications, mobile applications, mobile devices, hardware and software installation, principles of networks); and
- the responsible use of internet services (e-mail, web browsing, digital authoring, electronic databases, principles of digital communication).

Nielsen (1993) supports Prumper *et al.* (1991) and describes three main dimensions along which users' experience differs. These three dimensions are (Nielsen, 1993; Wu, 2000):

- experience with the system;
- experience with computers in general; and
- experience with the task domain.

The dimension most referred to when user expertise is discussed is the user's experience with the specific user interface (UI). Users are normally classified as either experts or non-experts, or somewhere in-between. Hence we refer to users with expertise between novice level and before expert as non-expert users. There is evidence to support the fact that non-expert and expert users behave differently (Hurst *et al.*, 2007).

Research conducted by Savage (2008) on e-commerce website usability indicated that non-expert and expert users act differently when interacting with an e-commerce website. Savage (2008) evaluated users conducting purchases on the Kalahari.net website. The Kalahari.net home page had a large number of advertisements, as can be seen in Figure 1. Savage (2008) found that non-expert users did not explore the web page (Figure 1) like the expert users did (Figure 2). Savage found that expert internet users in her study disliked advertisements and ignored such content or were distracted altogether.

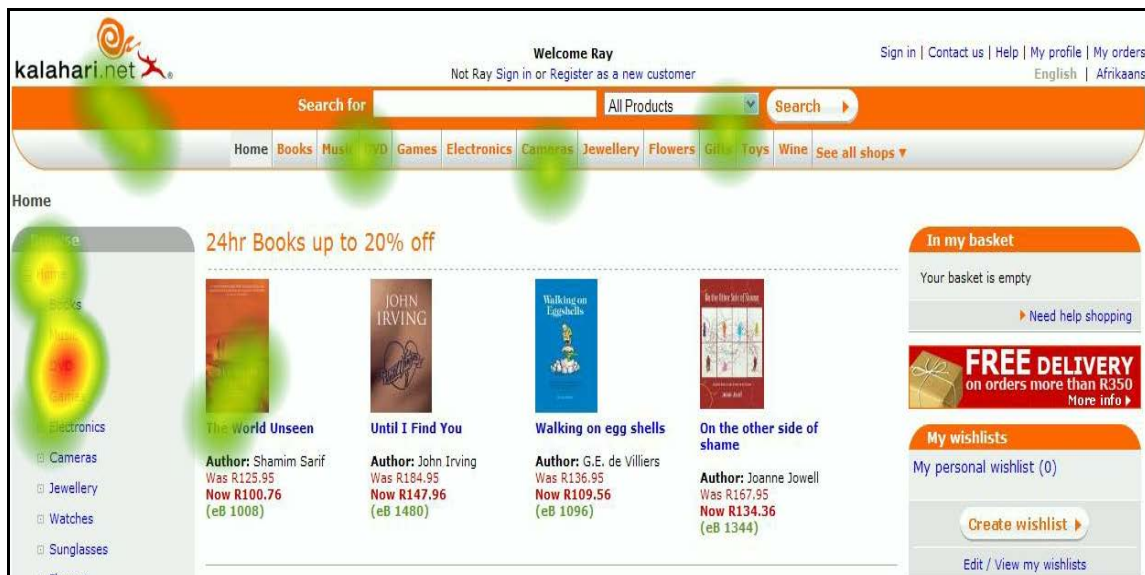


Figure 1: Heat map of Kalahari.net home page (non-expert user)

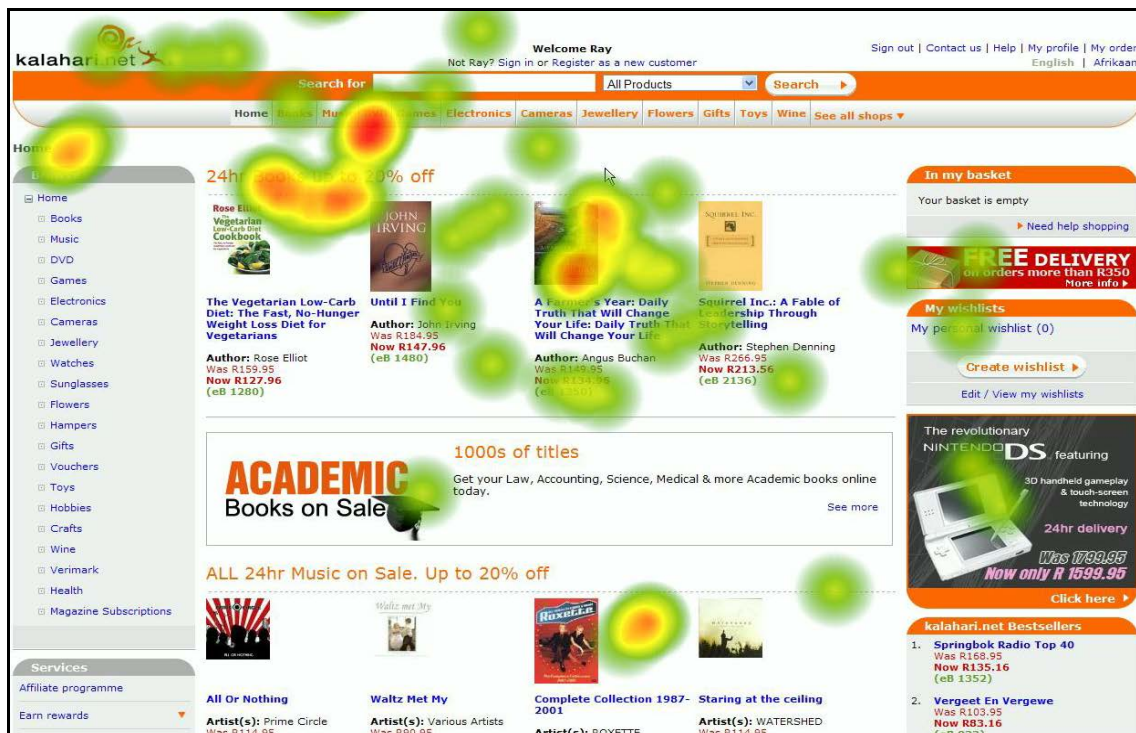


Figure 2: Heat map for Kalahari.net home page (expert user)

Eye tracking has been used to research the difference between experienced and less experienced users in information retrieval tasks (Dillon & Song, 1997), and different styles have been associated with experienced and less experienced users (Aula *et al.*, 2005). In general expert users perform faster and more accurately and have more defined search paths, whereas non-experts waste time searching or looking at non-relevant information (Kasarskis *et al.*, 2001; Law *et al.*, 2004).

Pretorius and Van Biljon (2010) conducted a usability and eye tracking study on a university information portal. One task given to participants in this study was simply to find the web page of a certain college from the main page. Only six participants out of 15 found the required page on their 1st attempt. Five of these participants were non-expert users. The median time for non-expert participants to find the page was 37,125 s; while the time for expert participants was significantly longer at 62,857 s. Figure 3 and Figure 4 show the heat maps of non-expert and expert participants respectively. A heat map shows the fixations of a participant, where the “hot” colours indicate areas most fixated on by a participant. In Figure 3, the red rectangle illustrates the area where non-expert participants searched for this information. The heat map clearly shows that non-expert participants searched in the correct place. In Figure 4, once again the area to find the information is indicated by a red rectangle. The expert participants have almost no hotspots on the heat map, indicating that they did not expect to find the information in that specific location.

Van Biljon and Pretorius (2009) highlighted the effect of ICT user skills and experience on the usability of websites and computer applications. Their research study reported the combined results of three usability studies that included formal laboratory testing, eye tracking and post-test questionnaires. The usability and eye tracking data showed differences in terms of task time (considerably longer for non-experts) and scan paths (longer for non-expert participants, with more fixations scattered over the screen). This supports previous findings on the eye tracking patterns of experts (Law *et al.*, 2004).

Pretorius and Van Biljon (2009) found several differences between expert and non-expert participants. Navigational difficulties are demonstrated in the following task from the study. Participants were required to find a library link on the university website. Usability data showed that all non-expert participants had difficulty in finding the library link: four participants gave up on finding the library link and needed directions to continue; while two participants first clicked on various other pages. Expert participants found the link without any difficulty.



Figure 3: Heat map of non-expert participants



Figure 4: Heat map of expert participants

Figure 5 demonstrates the eye movements of a non-expert user on the home page. Participants were searching for the library until the participant clicked on the correct link. The main goal in Figure 5 was to see what areas of the screen participants viewed the most, and where they searched for this information. The many fixations show how this non-expert participant struggled to find this information.

Non-experts had more difficulty in understanding the comprehension of terminology and error messages. They repeated their mistakes and received the same error messages repeatedly because they did not have the domain knowledge to understand the message. The results of the study indicated that ICT skill and experience influence the usability of systems to the point where a severe lack of ICT skills can make a system inaccessible and difficult to use. Working with ICT non-experts requires more structure in terms of doing tasks, more assistance and encouragement in reporting problems. It is therefore important to include both expert and non-expert participants in usability studies in the South African context. Section 5 explains the participant profile for the studies and how the participants were recruited.

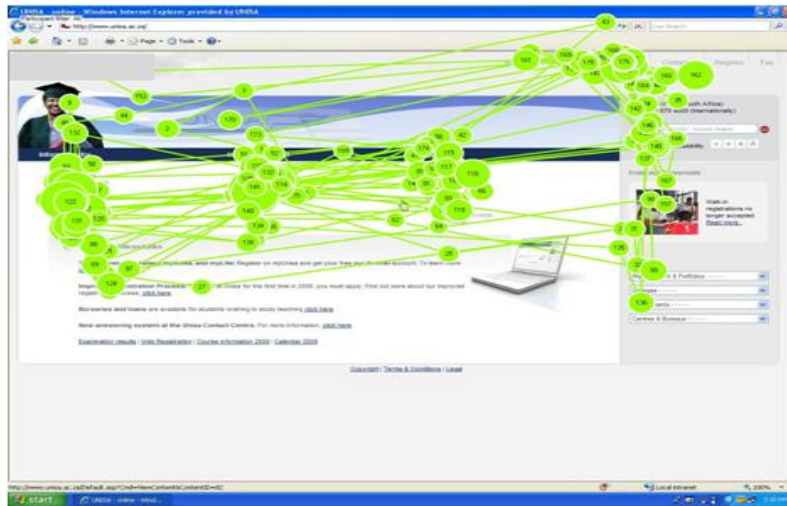


Figure 5: Non-expert (novice) participant scan path – many fixations searching for the correct data

USABILITY AND EYE TRACKING METHODOLOGIES AND TECHNIQUES

This section presents an overview of guidelines for eye tracking and usability methodologies and techniques that are discussed in literature. Table 1 illustrates different eye tracking techniques by several authors used before the usability test, during the test and after the test, and the analysis of the data (Benel & Ottens, 1991; Xu, 2000; Cowen *et al.*, 2001; Gao, 2001; Goldberg *et al.*, 2002; Renshaw *et al.*, 2003).

Table 2 summarises usability evaluation guidelines by several authors (Rubin, 1994; Dumash & Redish, 1999; Faulkner, 2000; Barnum, 2002; Rosson & Carroll, 2002). These guidelines include the planning of the test, determining what to test, test material preparation, conducting the test, analysing the data and reporting the results.

The usability and eye tracking guidelines listed in Tables 1 and 2 were used to compile an initial methodology for usability and eye tracking studies. The usability methodology has been refined in recent years (Pretorius & van Biljon, 2009). Recent literature (Pernice & Nielsen, 2009) on eye tracking methodologies includes authors utilised in this study. The next subsection discusses several studies in which this methodology was used and improved. Section 6 presents the improved technique based on the methodologies and techniques given in Table 1 and Table 2. Furthermore, the proposed usability methodology is a result of lessons learnt and improvements made from the studies listed below.

Table 1: Summary of eye tracking procedures						
	Xu (2000)	Gao (2001)	Goldberg et al. (2002)	Cowen et al. (2001)	Renshaw et al. (2003)	Benel and Ottens (1991)
Before the test	Welcome the participant.			Explain the task process to the participant.	Explain the task process to the participant.	Brief the participant (process and equipment).
				Show and explain the equipment to the participant.		
	Administer consent form.		The participant completes consent and disclosure forms.	The participant completes a consent form.		
	Pre-test questionnaire.	Pre-test questionnaire.	Demographic questionnaire.			
		Interface introduction.				
	The participant reads the notes.		The participant conducts three training tasks.			
The test	Calibration of the system's components.	System calibration.				
	Subject setup and calibration.	Subject calibration.	Eye tracker headband mounted. Subject calibration.	Eye-tracker headband mounted. Subject calibration.	Subject calibration.	Subject calibration.
	Data recording.	Data recording.		Record the data. Save the data files.		
			Conduct the test.		Conduct the experiment and record the data.	Conduct the experiment and record the data.
After the test	Post-test questionnaire.	Post-test questionnaire.	Post-task questionnaire.		Post-test questions.	Post-test questions.
	Participant signs payment form.					
	Thank the participant.		Experimental debriefing.			
Analysing data	Data analysis.	Data processing and image capture.	Data reduction.	Data analysis.	Data analysis.	Data analysis.

The selected usability methodology was used and updated in the following three case studies. This section discusses the action research conducted with the aid of three case studies, with users having different levels of computer expertise and from different cultural groups. The background and participant profile for each study are provided and is followed by an explanation of how the tests were conducted. Finally, the data collection is discussed, and how the usability methodology was updated.

Table 2: Summary of usability evaluation guidelines					
	Barnum (2002)	Dumas and Redish (1999)	Rosson and Carroll (2002)	Rubin (1994)	Faulkner (2000)
Test planning	Select the test team.				
	Define product issues and audience.	Define goals and concerns.			Identify the problem and formulate the hypothesis.
	Establish user profile. Recruit participants.	Select and recruit test participants.	Recruit test participants.	Select and acquire participants.	
	Select tasks to include in the test.	Create task scenarios.	Create task scenarios.		
	Determine how to categorise results.	Select and organise tasks to test.			
	Develop the test plan			Develop the test plan.	
Determine what to test	Set goals and measurements.	Define usability measurements.	Develop usability specifications.		
Test material preparation	Prepare the test materials.	Prepare the test materials, environment and team.	Develop the test materials.	Prepare the test materials.	
Conducting the test	Conduct walkthrough and pilot.	Conduct a pilot test.	Conduct a pilot test.		Design and execute the experiment.
	Greet participant and administer forms.	Care for the participants.			
	Brief the participant on the process.				
	Conduct the test.	Conduct the test.	Conduct the test.	Conduct the test.	
	Debrief the participants.		Debrief the participants.	Debrief the participants.	
Analysing data	Analyse the data.	Tabulate and analyse data.			Examine the data.
Reporting the results	Report the results.	Recommend changes and communicate results.	Report the test results.	Transform the data into findings and recommendations.	Communicate the results.

Study 1

Study 1 investigated the usability of an assignment submission of a *learning management system (LMS)*. Ten participants were used: five expert and five non-expert participants. The intended user group for the LMS is students who have to submit assignments online. A screening questionnaire was used to screen the participants for this evaluation. This questionnaire reflected the possible participant's LMS experience, computer experience, culture, age and gender. Regarding expert and non-expert users, results showed that individuals' ratings of their overall knowledge were better predictors than were estimations of frequency of use (Wu, 2000). The screening questionnaire asked

participants to rate their experience level as an internet user. The following ratings were available: Never used the web; *Beginner*: have read pages on the web; *Novice*: have entered addresses and used bookmarks; *Competent*: can use a search engine to find information; and *Proficient*: know my way around and have done web transactions like e-banking. From the 23 questionnaires completed, 10 participants were selected, five who had rated themselves as proficient internet users and another five who had rated themselves as between a beginner and a competent level. The first group were referred to as expert participants and the latter group as non-expert participants.

The participants had all used some sections of the LMS; their computer experience ranged from less than one year; between one and two years; and two years or more. Experience of the system was distributed fairly equally between the groups. The participants included five male and five female students. The mother tongue (first language they had learned to speak) of the 10 participants was as follows (number of participants indicated in brackets): English (2); isiXhosa (2); Afrikaans (2); SiSwati (1); Sesotho (1); Xitsonga (1); and Yoruba (1).

Study 2

Study two investigated the usability of a *university information portal*. Ten respondents participated: four expert and six non-expert respondents. The intended user group for the information portal website was prospective and current students, as well as academic and administrative staff at the university. A screening questionnaire was used to select the participants for this evaluation. The questionnaire reflected the possible participant's internet experience, specific website experience, computer experience, culture, age and gender.

The participants were ranked as expert or non-expert participants, like in study 1. From the 35 questionnaires completed, 10 participants were selected: four who had rated themselves as expert users and another six who had rated themselves as non-experts. Eight participants were prospective and current students and two were staff members. Experience of the system was distributed fairly equally between the groups, with experience ranging from never; less than one year; between one and two years; and two years or more. The mother tongues of the 10 participants were as follows: Afrikaans (3); English (2); Sepedi (1); Tsivenda (1); Zulu (1); Setswana (1); and IsiNdebele (1).

Study 3

Study 3 was done on a *university library website*. Specific focus was given to a potential new home page design. The intended user group for the library website is prospective and current

students as well as staff members. A screening questionnaire was used to select the participants for this evaluation. This questionnaire reflected the possible participant's internet experience, library website experience, computer experience, culture, age and gender. Ten users were selected for this usability study. The participants were ranked as expert or non-expert participants, like in studies 1 and 2, and they included a range of experience with the library website. The mother tongues of the 10 participants were as follows: Afrikaans (3); English (2); French (2); Setswana (1); Shona (1); and Yoruba (1).

Usability studies

The three studies were conducted in a similar fashion, with the differences as explained below. One participant was tested at a time. On arrival, the participant was briefed about the experiment, which was followed by an explanation of the equipment to be used. The details of the material to be recorded were explained and the participant was required to complete an informed consent form. This was followed by a 9-point eye tracking calibration. Participants were briefed about the systems and task list.

- Study 1 used a variation of the think aloud protocol, where participants were asked to comment if they were looking for something and could not find it; if they liked something particular about the website; and if they disliked something particular. The participants sat on their own to complete the tasks, with the facilitator sitting behind one-way glass. This was found to be a limitation, because some participants appeared uncomfortable sitting on their own, and when the facilitator spoke through the microphone, several participants turned around. This caused momentary loss of eye tracking data. Study 1 had the participants reading the tasks from a task list, and this also caused the participants to look away from the screen and to interpret the questions by themselves.
- Like in study 1, study 2 made use of the think-aloud protocol. This protocol had certain limitations. A few participants, possibly shy/introverts, did not always comment and had to be prompted for comments. The eye tracking data was also affected, as participants produced eye movements that they would not normally do. This study had the facilitator sitting with the participant, with the facilitator asking questions determined by the participant's website behaviour. This method was found to be more effective. Participants felt more comfortable with the facilitator by their side. Study 2 had the facilitator prompting the participant to complete a task; the participant did not have to read anything. This proved to be a more effective method, specifically for people with different home languages (other than English)

and limited computer experience (non-experts). If participants did not understand a question, it could be explained to them in more detail.

- Study 3 made use of the retrospective think-aloud (RTA) protocol, where participants provided a description of their experience in doing the task after they had completed it (Tobii Technology, 2009). Like in study 2, this study had the facilitator sitting with the participant asking questions from the task list. The facilitator also asked questions determined by the participant's website behaviour. Think-aloud protocol was not used during this study. The participants were allowed to carry out a task till completion or up to a point where they needed assistance. After this, participants were asked questions about each task, for example what they expected; and what they had liked or disliked. The eye tracking analyses were done for the sections mentioned first, and not for the sections where participants explained their actions. This method proved to be more effective than the think-aloud protocol variation.

Following the tasks for studies 1 and 2, an interview was conducted to ask the participants what they had liked the most about the system and what they had not liked, as well as questions about issues that the administrator had picked up. Study 3 included this quick interview as part of the RTA. This was followed by a post-test questionnaire and a debriefing, where the participant was thanked and given the opportunity to observe the data.

Data collection

Data was collected and calculated as follows: live video recordings were captured, including the screen, participant's face and mouse/keyboard movements; notes were taken during the test and a full evaluation of the video was done at a later stage; audio in the form of the participant or the test administrator speaking was included with the video files; eye-tracking video recordings included a cursor that indicated the participant's eye movements; eye tracking data files were set up, and a post-test questionnaire was used to capture the participants' perception of the user interface and the system. Tasks were also monitored continuously. The usability metrics of these studies included: task completion rate; number/percentage of tasks completed with and without assistance; error rate recovery; task completion time; real-time events (mouse clicks, keyboard presses); and a post-test questionnaire. The eye tracking measures used in these studies included the number of fixations; number of fixations on each area of interest (AOI); time to the first fixation on an AOI, and scan path.

The studies used one or more of the following post-test questionnaires: Computer System Usability questionnaire (Lewis, 1995); System Usability Scale (SUS) questionnaire (Brooke, 1996); and open-ended questions relating to the participants' perception of the system.



Figure 6: The usability laboratory: observer room



Figure 7: The Tobii T60 eye tracker (usability laboratory - participant room)

The usability laboratory consisted of an observer room (Figure 6) and a participant room (Figure 7), separated by a one-way mirror. The participant room was equipped with a 17" TFT monitor with resolution of 1280x1024 and a Tobii 1750 eye tracker, allowing the eye movement of participants on the screen to be recorded. A nine-point eye tracking calibration was used at all times. The calibration process required a participant to look at several points/marks on the screen in order to set up the eye tracker and to ensure accuracy. During this calibration the eye tracker recorded the value that corresponded to each gaze position.

THE PROPOSED USABILITY METHODOLOGY

This section presents a proposed usability methodology based on the methodologies and techniques provided in Table 1 and Table 2. Furthermore, the proposed usability methodology is a result of lessons learnt and improvements made from the studies listed in section 5.

The evaluation methodology

Usability evaluation methodologies suggested by Barnum (2002), Dumas and Redish (1999), Rosson and Carroll (2002), Rubin (1994) and Faulkner (2000) were investigated for this research. Eye tracking techniques by Goldberg and Kotval (1999), Xu (2000), Gao (2001), Goldberg *et al.* (2002), Cowen *et al.* (2001), Renshaw *et al.* (2003) and Bennel and Ottens (1991) were combined with appropriate usability evaluation methods. Pretorius *et al.* (2005) suggested a methodology based on this research for network management tools. A methodology based on the methodology by Pretorius *et al.* (2005) was used in three usability and eye tracking studies where the usability methodology was improved after every test on the basis of lessons learnt in the tests. Table 3 gives the improved usability methodology, combining usability-evaluation techniques with eye tracking techniques. Table 3 lists the basic steps involved in planning and effectively implementing a formal usability test. Step 13, conduct the usability test, was where the majority of the improvements were made. The steps included briefing the participant, administering the forms, calibrating the eye tracker, recording data and debriefing the participant. Section 6.2 (Table 4) discusses this step in more detail.

Step 11 lists the recruitment of participants. It is important to select participants who are representative of the background and abilities of the intended users of the product. Once the user profile has been developed, a screening questionnaire can be used to ensure that prospective participants match the characteristics as determined. As was mentioned in section 4.2, it is important to consider both expert and non-expert participants when South Africans are the intended users. South Africa has 11 different official languages. Participants speaking several different languages were recruited in each test. Initial analyses showed that participants with English as first language performed better than participants with another language as their first language. Future work will investigate the role of home language in usability analysis in more detail.

Table 3: The proposed usability methodology	
Step	Step description
1	Establish the team.
2	Define the product issues and audience.
3	Formulate the research hypothesis.
4	Set goals and define usability measurements.
5	Define eye tracking metrics.
6	Establish the user profile.
7	Select the tasks to include in the test.
8	Determine how to categorise/analyse results.
9	Develop and write the test plan.
10	Prepare the test materials, environment and team.
11	Recruit the test participants (experts and non-experts).
12	Conduct a pilot test.
13	Conduct the usability test.
14	Tabulate and analyse the data.
15	Recommend changes.
16	Report the results.

Including eye tracking in the proposed methodology has certain limitations. There are many eye tracking devices available today, some more suitable for usability laboratory tests and other more suitable for outdoor tests. It is important to select one that will comply with the experiment's specific needs. The Tobii 1750 eye tracker was used during this study. The eye tracker device needs to be calibrated for each participant before a test. The selection of participants has to be done carefully, since not all participants can be calibrated and tracked successfully. Certain individuals' eyes cannot be tracked due to external reasons, such as glasses or contact lenses. The Tobii 1750 proved to be more reliable than previous eye trackers used, when participants with glasses had been participating. Other issues may also cause problems, including the pupil of the eye not reflecting enough light, or the iris being too light in colour to distinguish it from the pupil reflection. Future eye tracking studies will include studies on the Tobii T60 eye tracker (Figure 7), one of the latest available eye tracking technologies.

Procedure during the test

This process, step 13 of the proposed methodology, is presented in Table 4. It is based on only one person conducting and facilitating the test. All these studies were conducted with one person conducting and facilitating the test. Additional resources were not available. When a second or third person is available, they can log activities while the facilitator can focus only on facilitating. All the data is recorded, so having activities logged during a live test is not

necessary. Participants should be assisted and encouraged to ask questions, especially participants from non-English-speaking countries, as was observed in the three studies conducted.

CONCLUSION AND FUTURE WORK

The goal of this study was to provide a proposed usability methodology (Table 4) for usability research with supplemental eye tracking in a South African context, where a large section of the population does not have the required computer and internet expertise and come from different cultural backgrounds. Expert and non-expert participants were recruited for the three studies discussed in this paper, including people with different cultural backgrounds and home languages. The results of these studies (Van Biljon & Pretorius, 2009; Pretorius & Van Biljon, 2009) (not included in this paper) showed a clear distinction between expert and non-expert users aligning with previous studies (Hurst *et al.*, 2007). It is important to include participants with different cultural backgrounds and first languages, as English first-language participants tended to perform better than participants with other first languages.

Table 4: The proposed usability methodology for the Southern African context

Step	Step description
1	Welcome the test participant.
2	Brief the participant. <ul style="list-style-type: none"> • Introduce the observers. • Show and explain the equipment to the participant. • Explain the website/system being evaluated. • Explain the task process to the participant. • Remind the participant that the product is being tested and not the user. • Switch all cell phones off.
3	Administer forms and consent form.
4	Participant eye calibration.
5	Conduct the test. <ul style="list-style-type: none"> • Record eye tracking data (with face and sound). • Sit with the participant while doing tasks. <ul style="list-style-type: none"> ○ Give the tasks to participants by informing them (do not let the participants read from a list). ○ Prompt for answers/thoughts when struggling. (An important step in developing countries). • Log important participant activities. • Save the data files after the test.
6	Retrospective think aloud <ul style="list-style-type: none"> • Quick interview - what did you like or dislike. • Troublesome/highlighted areas – show eye tracking. • Keep the recording running for final comments.

7	Administer post-test questionnaire. <ul style="list-style-type: none"> • Open the website/system – option for participants to look back for information. • Use a standard usability questionnaire plus an open-ended questionnaire.
8	Debrief the participant.
9	Hand incentive to participant and thank the participant.

The focus of this paper was the development of a usability methodology and techniques that could be utilised to conduct similar studies in Southern Africa. A literature study was done on existing usability and eye tracking methodologies and techniques. A variation of a combined methodology by Pretorius *et al.* (2005) was used in these studies, with participants from fourteen different language groups. Study 1 used a variation of the think-aloud protocol, where participants were asked to comment if they were looking for something and could not find it; if they liked something in particular about the website; and if they disliked something in particular. The participant sat on his/her own, completing the tasks, with the facilitator sitting behind one-way glass.

Study 2 made use of the same variation of the think-aloud protocol. This study had the facilitator sitting with the participant, with the facilitator asking questions determined by the participant's website behaviour. The participants appeared much more relaxed with the facilitator by their side and more data was also collected, with the facilitator being able to ask questions more freely. Study 3 made use of the RTA protocol, where participants provided a description of their experience doing the task after completion. Using traditional think-aloud protocol in combination with eye tracking has proven to be less suitable, as participants then produce eye movements that they would not normally do if completing their task on their own in their normal environment (Kim *et al.*, 2007). The RTA, combined with the facilitator sitting next to the participant, was found to be the most suitable in the South African context.

A proposed usability methodology for usability testing supplemented by eye tracking is provided (Tables 3 and 4): a result of the lessons learnt and improvements made from the studies discussed in this paper. Specific consideration was given to the procedure during the test (step 13 in Table 3; Table 4) and includes welcoming and briefing the participant, administering the forms, calibrating the eye tracker, recording data, RTA, administering post-test questionnaires and debriefing and thanking the participant. Future research will apply these findings on related and internet-based systems and further investigate guidelines for systems to accommodate both expert and non-expert users. The usability methodology will also be applied to other developing world countries and related websites and systems. Future work will further include the

comparison of recent methodologies (Pernice & Nielsen, 2009) with the usability methodology presented in this paper.

The role of home language in usability evaluations was initially perceived to be an important research variable that the authors would have liked to have investigated in detail. The research has highlighted the importance of the variable, but the authors could not conclude any meaningful results on the influence of home language from the three case studies, however. Specific usability studies taking this important variable into consideration should be conducted in the future.

The role of expert versus non-expert participants indicated that expert participants performed noticeably better than the non-expert participants. Non-expert participants completed tasks more slowly and required more assistance. These results were validated by results from Jason (2008) and Savage (2008).

Managers in South Africa are increasingly realising the importance of the usability analysis of computer applications and the websites of a business, specifically when the applications are utilised by people from different educational, cultural and language backgrounds. Marketing material is increasingly being tested for layout, customer attention and brand awareness. Usability analysis can provide valuable feedback to managers and marketing professionals. New mobile usability technologies are becoming available in South Africa that customers can use in real-life situations in order to track eye movement and conduct eye tracking studies.

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