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Designing Disclosure

Prepared by Irani Sangham

SNGIRA001

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Supervised by: **Dr Nosakhere Griffin-EL**

Abstract

This research project's main aim was a pragmatic investigation into the process of social technology design. Specifically, it was focused on the design of social utilities, which are technologies that enable new spheres of virtual social interaction. This aim was achieved through the investigation and transcription of the experiences of engaging in the design of a new social technology. The proposed technological system was aimed at addressing computer literacy within the Western Cape, through the design of a virtual learning utility. This project was embedded within an already established learning programme (Western Cape Government's Cape Access Project), which had several limitations regarding scalability, usability and accessibility. The main research aim therefore was the exploration of these areas of concern through the lens of ontological design. These research goals were achieved through a qualitative approach. The main approach undertaken was a phenomenological one, which was used to grasp the essential experiences present in the situation of context and to understand the experiences of the design process within that context. This phenomenological approach was taken from a researchers point of view while and ethnographical analysis was used in conjunction with phenomenology, to elicit the shared phenomena of the intervention. Design science and design thinking was used to integrate and combine both the phenomenological and ethnographic analysis into a coherent transcription of this design process.

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Chapter 1: Introduction

1.1 Situation of Concern

1.1.1 Research Requirements.

"The quality of an intervention is dependent upon the interior state of the intervener."(Scharmer quoting Bill O'Brian, 2007)

At the beginning of this research, the researcher was faced with multiple situations that had assembled to form the necessity to intervene. There are three circumstances, which this research had stemmed from and which shaped the process and outputs of this research study.

The first situation of influence arose from the educational requirements that the Graduate School of Business had proposed for obtaining a masters degree in inclusive innovation. This consisted of attempting to combine 1) an academic in depth analysis of an area, to establish a base of knowledge with 2) a practical experiential approach of a tangible understanding of the situation of context. These two aspects needed to be intervened upon in a simultaneous manner in order to create a practical guide for the practitioner to act on, while having a base of in depth knowledge to support them. The outcome of this could be articulated in a prototype, with a supporting thesis and a supporting business model. Students were required to investigate what it meant to create inclusivity in order to deliver innovative solutions to societies wicked problems.

The second situation of influence emerged from the researcher's current occupation, as a user experience designer at the Western Cape Provincial Government, department of the Premier, within the component called e-Government for citizens. This impacted the research study by creating a platform for the researcher/practitioner to apply the educational requirements into the field of choice in a real-life manner. This platform called upon a need for creating a digitally inclusive system for the citizens of the Western Cape. In this case, the researcher was also a practitioner, engaging in this role on an everyday basis.

The third situation of influence came from the researcher's career goals and aspirations as a user experience designer. The researcher / practitioner, had reached a crisis regarding the path chosen, a stagnation had been reached and a longing for

rejuvenation had led the researcher to study further and create a larger knowledge base from which to practice from.

These three influences created a deep curiousness within the researcher to embark on a research project that could create a toolkit of knowledge, practical skills and reflexivity in order to share meaningful experiences with others.

1.1.2 Research Background.

This research is situated within the field of *design* and specifically the design of technology embedded within *human activity systems* (Heidegger, 1953) . The aim is to explore the role of technology within societies, with specific emphasis on how these technologies affect human systems to evolve, grow and create solidarity. This research will explore the fundamental ontological claims unacknowledged in traditional design methodologies and whether these assumptions still serve this role for technology today.

The major area of concern in the design of technological systems is that they are embedded within a complex world of multiple ontological narratives (Moldoveanu & Martin, 2008; Johannisson, Ramírez-Pasillas, & Karlsson, 2010; Scharmer C. O., 2009). This means that there are multiple ways of approaching the world, multiple ways of *knowing* and *being.* It is the role of technology to bridge these multiple narratives, in a synthetic and integrative manner; such that new worlds, new ontologies are born which act as *common ground*, in the creation of solidarity and shared practices. This research approach is distinctly Heideggerrian, in that it attempts to *deconstruct* the underlying ontological assumptions within technology design. In so doing, it attempts to reveal a more fundamental mode of *design thinking*; one found in what Heidegger called *unconcealment.*

This research will investigate Heidegger's landmark paper, *The Question Concerning Technology (1953)* as the basic theoretical foundations of research. The aim is to build on these concepts referencing further works; *Understanding Computers and Cognition (1987)* and *disclosing New Worlds (1997); Rethinking Design Education for the 21st Century: Theoretical, Methodological, and Ethical Discussion (2001); Ontological Designing – laying the ground (2006); Opposable Mind: Winning Through Integrative Thinking, (2009); Theory U: Leading from the future as it Emerges, (2009); Becoming human by design, (2012); Design for Dasein -*

Understanding the Design of Experiences (2015). These texts build on the concepts of *ontological design.*

The majority of the design of technology experienced today is due to an overemphasizing of the task and an underestimating of the practices, which can be realized through technology. In Winograd and Flores' (1988) interpretation, technology does not stop at the material object perceived as a tool, it is about the "design of practices and possibilities to be realized through artifacts." The possibilities and new spheres of practice, which technology that are revealed are what needs to be accentuated (Flores & Winograd, 1988).

1.1.3 The Practical Problem.

As explained above, technology is often built within a paradigm of *instrumental rationality* (Heidegger*,* 1982*, pp 3- 35),* which means it takes an objective view of reality and most importantly places design as that process which manipulates resources to achieve its goals. The effect of such an instrumental technocracy leaves an individual separated from their role as *disclosers of new worlds of being.*

Design is meant to serve as a lens to imagine possibilities, to be the bridge between creativity and experience; or a way in which ones discloses new experiences. Currently the focus in technology may be that design sprouts from the wrong understanding; that which is a narrow objective viewpoint, which is tainted by business contracts, government policies and stakeholder needs. It is rare that the citizens or users come into account as the fundamental components. As Findeli (2001) articulates:

> "we have an extremely narrow philosophical anthropology which leads one to consider the user as a mere customer or, at best, as a human being framed by ergonomics and cognitive psychology; an outdated implicit epistemology of century; an overemphasis upon material shapes and qualities; a code of ethics originating in culture of business contracts and agreements; a cosmology restricted to the marketplace" (Findeli, 2001).

These misunderstandings in design have stemmed from the effect of product engineering and marketing on design, i.e. the determinism of instrumental reason and

central role of the economic factor as the almost exclusive evaluation criterion (Findeli, 2001).

This in turn creates unwanted outcomes and harmful reflections of oneself, society and systems. Currently, systems are designed from an objective base, which means, designing a system, product or service to meet business requirements exclusively. However, there is a greater need to inclusively design in a way that is grounded in human activity to gain a more holistic idea of what the citizen or users *experience* of what the system or product should entail. The practical problem here is to figure out what the process is for creating a social utility, which delivers both business value and most importantly citizen value. The platform is a computer literacy system for the citizens of the Western Cape; citizens must be able to easily learn how to use ICT (Information communication technologies) provided by the Western Cape Government. The platform will be designed with the purpose of fulfilling the citizens' needs of Cape Access e-Centres, in rural areas placed across the Western Cape and the business needs of Cape Access programme stakeholders, who sit within the Department of the Premier. Cape Access, claims to provide services such as; access to the internet, access to e-mail platforms; basic computer training, accredited advanced computer training; access to job opportunities, business and research information; printing facilities and government information and services.

1.1.4 The Research problem.

Following on from the practical problem; this way of designing is due to the fact that systems are designed from an objective point rather than being grounded in a human centered approach. As (Findeli, 2001) points out, designers have become restricted by the culture of business in their artistic approach to designing systems and products, by placing more emphasis on the material shapes and identity rather than the practices undertaken by the users. Similarly, Heidegger, (1977) refers to a similar concern in his question concerning technology, where his claims that one must not be in awe of the actual artefact, but rather one's focus should be in the actual *tasks* performed while using technological tools. Heidegger, (1977) refers to technology as a mode of revealing through the tools used in the experience of technology and not the actual tool. Winograd & Flores, (1987), also refer to this shift in focus from the artefact to the revealing that the artefact may bring about.

> "Through the emergence of new tools, we come to a changing awareness of human nature and human action, which in turn leads to a new technological development. The designing process is part of this 'dance' in which our structure of possibilities is generated. (Winograd & Flores, P. 163, Understanding Computers and Cognition, 1987)"

Winograd & Flores, (1987) insist that the most important designing is ontological. Ontologically designing is the act of using the background of one's heritage, building on already existent ways of being in the world, which deeply affect potential kinds of beings.

> In creating new artefacts, equipment, buildings and organizational structures, it attempts to specify in advance how and where breakdowns will show up in our everyday practices and in the tools we use, opening up new spaces in which we can work and play. Ontologically oriented design is therefore necessarily both reflective and political, looking backwards to the tradition that has us but also forwards to as-yet-uncreated transformations of our lives together (Winograd & Flores, P. 163, Understanding Computers and Cognition, 1987)."

Ontological design implies different ways of understanding how Being, as modern subjects, 'are' and how one may be who or what they are in the modern world. Simply put, "we design our world, while our world acts back on us and designs us" (Willis, 2006). The tradition of ontological design emphasizes the role of the intervener or discloser as one who reveals *new ontologies.* Therefore, the experience of the designer is of critical importance. This is because the fundamental methodology of ontological inquiry is *phenomenology.* The fundamental methodology of design is to understand the phenomena of the experience itself and to use this to synthesize new ways of being. For this reason my research will engage into a phenomenological inquiry into design, around three practical projects, which involve the design of *techno-social* systems. The goal of this research is to shed light into the experience of *ontological design*, in the hopes of contributing in part to a new context of technology design (for Cape Access programme).

There are two major, practical dimensions this research will be concerned with:

1) To create a design strategy for developing a system that is grounded in user-centered design process, which delivers both business value and citizen value.

2) A learning platform for computer literacy and digital e-skills development, for the Western Cape Government's Cape Access programme.

The exploration of this research lies in two roles; the role of the designer in the creation of technologically orientated human activity systems and the role of technology in creating *new worlds* or ontologies for citizens.

1.1.5 Research questions.

i) How does the process of design work at facilitating a better network and conversation that enables new social paradigms of interaction?
ii) How do designers prepare for future technological systems from which to liberate the potentiality of Being and how is this realized through the many current and future technological artefacts?
iii) How do designers of digital government systems, deliver value to the citizens and create better possibilities and practices inclusively?

1.2 Aims of research

1.2.1 Academic Aim.

How does Heidegger's question concerning technology, (1977, pp 3- 35) apply or manifest in the public sphere? Specifically, this research will explore these questions in the context of the Western Cape Access e-Centres. The main claim of Heidegger's thesis in this essay (discussed in literature review above) is that the advent of Cybernetics (Banathy B. H., 1996) and particularly the current age of rapid technology development are accompanied with certain blindness. This blindness is specifically 'ontological', that is, it ignores the question or the potentiality of Being. The Cape Access Project is a very fertile research area to explore this because it lies at the very union of social and technological systems.

1.2.2 Strategic aim.

In conjunction with the above stated academic aim, this project also affords an opportunity to create a sustainable and user centred government service. The preliminary research has indicated the need for a reformulation of design approaches in the development of social utilities within government. In this way, this research project creates the strategic opportunity of finding ways of determining citizen need, business value and technological ability in the delivery of coherent and sustainable techno-social systems.

The strategic and business benefit may therefore be articulated in two ways:

1. The design and development of the stated system
2. The first articulation of a design process for government provisioned social utilities.

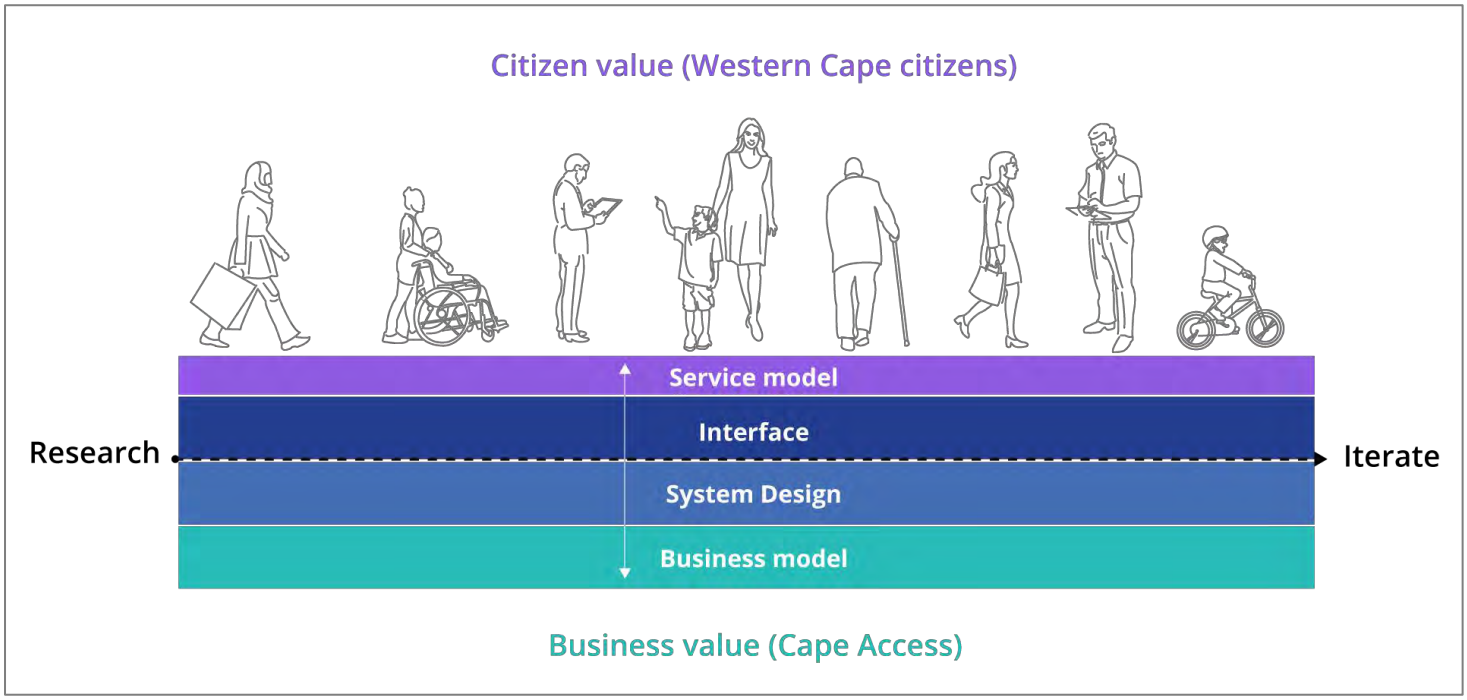


Figure 1. The alignment model used in this research study

Figure 1. illustrates the alignment model created specifically for this research study, it shows how the business value and citizen value must be aligned to maintain value throughout the system. Alignment diagrams are used across many fields, in this

case it explains how the offerings of the business and the needs of the citizens are aligned.

Kalbach, (2011), describes an alignment diagram as having two major parts. On the one side, it illustrates various aspects of user behavior, actions, thoughts, and feelings, and other aspects of their experience. On the other side, alignment diagrams reflect a business' offerings and processes in some way. The dotted line marks the line of interactions where the interactions between customers and an organization take place, this is known as the touchpoint.

The first layer; the service model relates to the artefacts created during this research such as: personas, citizen journey maps, information architecture maps and wireframes. These artefacts sit on the service layer, because they are related to gaining insight into the citizens involved with the provided service this system provides.

The second layer is the interface layer, this refers to the detailed designs produced and the prototype created for testing with the actual users of the system. This layer is involved with a constant, iterative redesigning in order to meet the developing needs of both citizens and business.

On the other side of the interface lies the system design layer which aims at analysing what sorts of methods and techniques will need to be put into practice to create this interface and its content. As an example, what practices may be needed in order to maintain the systems interface activities. This layer requires careful management and feedback from the above layers in order to continually be relevant to the citizens, while transforming new business needs into useful engaements for the citizens.

The bottom layer refers to the business model, this layer relates to the business needs which need to be acted on. The business model layer refers to the *why* of the system, while the services model refers to the *how.* These two aspects need to maintain alignment to create a unified system of value of both sides.

Chapter 2: Literature review

The literature review will focus on the key concepts of Ontology, Coordination and style, Breakdown, The role of the discloser and designing disclosure.

The world is determined by what one does and what one does determines their world. This is the fundamental idea behind *ontological design*, "we design our world, while our world acts back on us and designs us. (Willis, 1999; Fry, 2012; Wendt, 2015)." As one is experiencing the world, and as each experience, reveals itself, they then act on this and project from that their way of *being in the world*.

Anne-Marie Willis, (1999), claims that Ontological designing refers to a hermeneutics of design concerned with the *nature* and the *medium* of design, which understands design as a subject-decentered practice, acknowledging that things and people design. This creates a particular argument towards ways of going about design activity.

There are several components that are interconnected with the *way of being* and how, in turn, being is positioned in true reflection of the commitments to act accordingly. This determines identities and presence in the world and helps to understand how beings coordinate their activities in everyday experience. This process reveals break downs which are crucial for re-hacking or re-designing being in the world (Spinosa, Flores, & Dreyfus, Disclosing New Worlds, 1997). Finally, a look at what role *technology* plays in the transformation and revealing of ourselves and how designers can design human-centered experiences. This literature will review these components revealing the emerging concepts and themes and the description thereof.

2.1 Ontology

Ontology refers to the meaning of being or existence itself. To describe ontology clearly, A Heideggerian lens, will be used to assimilate its fundamental concept. Heidegger (2008) is interested in what it means for entities to exist, he is interested in modes of being, or existence. Heidegger (1988) states that ontological means "of or belonging to the understanding of being." Willis describes that ontic refers to what is; ontology refers to enquiry of what is, while ontological refers to the condition or behaviour of what is.

In *Being and Time* (2008) Martin Heidegger talks about what it means to exist, in a sense he looks at existence as a historical activity – the mode of being, or mode of existence. Historical activity, in Heidegger's sense, refers to being as moving through the world, with a pre-understanding, or an inventory of knowledge, which has previously been understood through past situations. Winograd and Flores, (1986) explain that any individual, in understanding his or her world, is continually involved in activities of interpretation. That interpretation is based on prejudice (or pre-understanding), which includes assumptions implicit in the language that the person uses. That language in turn is learned through activities of interpretation. The individual is changed through the use of language, and the language changes through its use by the individuals. Heidegger says that being-in-the-world, means the world is the existential structure of Being; it is a structure of possibilities based upon a history of experience that Being is defined in its temporality. In this way one always understand things through experience, at this level, things, which are revealed to one, are believed to be true. What one understands is based on what one already knows, and what one already knows comes from being able to understand (Heidegger, 2008; Winograd & Flores, 1987; Dreyfus 1990).

Spinosa, Flores and Dreyfus (1997) in their book *Disclosing New Worlds* describe all pragmatic activity as being organized by a *style*. Style is their name for the way all practices ultimately fit together, (Spinosa et al.,1997) claim that a *style* is not an aspect of things, people, or activity but, rather, constitutes them *as what they are.* The online social media platform, Facebook may shed light on what style may refer to, there are user interface elements that must be used when engaging in the practices that Facebook create. These interface elements represent certain actions and metaphors to communicate to the user *how* they can react to an experience they may encounter. These actions are wrapped up in a communicative layer, which acts as an extension of the system. This is what the user must interact with, in order to partake in activities such as clicking the like button when one sees interesting media on their feed. Facebook have organized a style, where users may tangibly experience the product as it is.

Accompanying the concept of style is Heidegger's notion of a *worldhood*, which is an interdependent and interrelated set of meanings, that is complete. He calls this a *worldhood* because Being constantly projects it (*worldhood*) they move through their experience of the world. Disclosing a worldhood, by definition means having an

experience of a certain *way of being*. With this experience of a world, Being brings with them, the capacity to experience it, which means it gets revealed to them. That is that "any individual, in understanding his/her world is continually involved in activities of interpretation. That interpretation is based on prejudice or pre-understanding (Winograd & Flores, 1987)."

A world for Heidegger, has three characteristics; Inclusively non-related pieces of *equipment*, which are used to perform a specific task. These tasks achieve certain *purposes*, which enable those performing them to have *identities*. These identities are the meaning or point of engaging in these activities (Flores, Spinosa, & Dreyfus, 1998).

For this reason, Heidegger argues that the separation of the subject and the object denies the more fundamental unity of being-in-the-world (*Dasein*). From the distinction that I (the subject) am perceiving something else (the object), means I have stepped back from the pre-eminence of experience and understanding itself, which operates without reflection. In other words:

> "The interpreted and the interpreter, do not exist independently, existence is interpretation and interpretation is existence (Winograd & Flores, 1987)."

This view of the world as interpretation (from a distinctly Heideggerrian perspective) is called Hermeneutic Phenomenology. This is an appropriate ontological stance for the investigation because it is interested in ontological design. This means human beings are specifically engaged in designing bridges between multiple and varied ontological stances in a synthetic and integrative manner. The task of the ontological designer then is to disclose worlds, which are based on shared *sense making* or shared hermeneutic foundations.

To explore this further, Dasein operates within the world based on a basic hermeneutic process or sense making. This 'way' of making sense of things and experience is what determines the way *dasein* act within that world – this can be called the *style* in which dasein acts in the world. Therefore ontological designing refers to unearthing the sense generating machinery between differing ontological stances; and through that difference, to disclose new possibilities for being.

2.2 Coordination or Style

An individual's way of being, or *style* is the basic understanding of human activity and experience. Style acts as the grounding from which practices are maintained and also the platform from which *new practices* are developed (Flores, Spinosa, & Dreyfus, 1998) This way of being, deals with its surroundings through learning and perceiving patterns of interlocking meaning, then applying this to the activity at hand (for example, walking, thinking, driving, or conversation). Regarding driving, as a young child, or before one knows how to drive, it is an unknown way of being which they have not yet expereinced. In order to drive a car one must learn how to navigate themselves in accordance with this new tool in order to become comfortable with using it. Once they become habituated into this new way of being, it becomes second nature to use.

Often, one does not notice themselves as agents, people, or any thing in these activities. Once one becomes habituated to a style, it becomes invisible to them (Flores, Spinosa, & Dreyfus, 1998). From a Heideggerrian perspective it is called *thrown-ness*, this means that basic engagement in the world is not of reflection, or not rational and reflective naturally, but rather habituated which means one is engaged in the world. Rather reflection occurs in *breakdown* of this thrown-ness, which is an encounter with the uncertainty of experience. In this breakdown being must *make sense*, reflect and create concepts that allow them to *cope* or adapt. Simarlary, Paulo Freire, (2000) refers to a similar process which he calls *praxis*. Freire, (2000), states that through critical reflection and action humans can transform their reality. He refers to praxis being a dialectical process consisting of reflection on a situation, then taking action on that very situation. This action will bring about a change to the situation, from which one's experience of bringing change informs new thinking, this is what Freire refers to as praxis, as transformation of reality.

What needs to be done, said or thought of straightaway draws an appropriate response from being. The response to a situation that appears in terms of the actions taken. It is only at the unexpected moment when something does not go according to expectation that being experiences a disharmony (*breakdown*) which begins to call upon different ways of being, or different patterns to figure out how to deal with the unexpected.

A suitable example here would be the interactions with mobile phones today.For example the engagement in a discussion on an instant messaging platform, where the user is deeply immersed in the conversation and is not focused on typing in every single letter, it just flows naturally and there is no reflection needed, because there has been a pre-performing and pre-learning in how to interact with their mobiles, in an embodied manner. This has led to a habituated manner in which individuals to relate to thier mobiles. Spinosa et al.,(1997) have followed up by saying, " We see things as odd artefacts until we become familiar with their use, and then we become virtually incapable of seeing them as strange (Flores, Spinosa, & Dreyfus, 1998)". Through observing a style of organizing "or the coordination of actions", there can be an articulation of a disclosive space. This disclosure allows the underlying coordination or sense making processes to be expressed, and affect the system in three ways:

> "1) *by coordinating* actions, 2) by determining how things and people matter and 3) by being what is *transferred* from situation to situation. These three functions of style determine the way anything shows up and makes sense for us." (Spinosa et al., 2007)

Through being present to this disharmony or breakdown, a sense of how this system is dynamic and changing, reveals itself, that is to say there is an understanding of how it is attempting to evolve. To elaborate here, two things "show up" in this breakdown. Firstly the breakdown discloses coordination, it unearths the roots of sense, so to speak, which instantiates the system itself. Secondly, it points out the areas in which the system is failing and shows these as the exact places in which change or development must occur. These two points are the basic points of departure for ontological design because it shows a breakdown in the hermeneutic machinery and also gives and indication of the developmental trajectory of the system.

The next question is to figure out how to facilitate the emergence of a new style – this requires the ability to work with the above two points as the actual foundation for design. This skill for dealing with a disharmony or discordance is more complex than the skill for noticing and holding on to it. Spinosa et al. (2007) suggest that there are three ways one can do this, namely articulation, reconfiguration and cross-appropriation.

There are two aspects of a disclosive space: it's *organization* and *coordination*. In order for things and selves to show up as meaningful (as opposed to just effective) this organized activity needs further organization called coordination (Flores, Spinosa, & Dreyfus, 1998). In the articulation of change, the style crystalizes the core identity and becomes more recognizable in its pure form, for what it actually is. Reconfiguration is a more substantial way in which a style can change. In this case some marginal aspect of practices coordinated by a style becomes dominant. Cross-appropriation takes place when one disclosive space takes over from another disclosive space, a practice that it could not generate on its own but by what it finds useful. Articulation, reconfiguration and cross-appropriation are three different ways in which disclosive skills can work to bring about *meaningful historical change* of a disclosive space. All of these types of change are historical because people sense them as continuous with the past (Flores, Spinosa, & Dreyfus, 1998). These three ways in which disclosing may be historical – or may produce changes in coordination of practices – leads to the investigation into being *sensitive* to the disclosing that one is carrying on in one's life, which is called *disclosing*, that one is a *discloser* (Flores, Spinosa, & Dreyfus, 1998).

2.3 Breakdown

Breakdowns play a fundamental role in design. The objects and properties that constitute the domain of action for a person are those that emerge in breakdown. In creating new artefacts, equipment, buildings and organizational structures – attempts to specify in advance *how* and *where* breakdowns will show up in everyday practices and tools utilized, in opening up new spaces from which to work and play (Winograd & Flores, 1987). A breakdown is not a negative situation to be avoided, but a situation of non-obviousness, in which the recognition that something is missing leads to concealing (generating through declarations) some aspect of the network of tools that human beings are engaged in using. A breakdown reveals the connections of relations necessary for to accomplish tasks and this shows a clear objective for design - to anticipate and be sensitive to the forms of breakdown and provide a space of possibilities for action when they occur.

2.4 The Role of the discloser

This realisation of human beings as disclosers is one of great importance, because as dislcosers, important structures of existence can be disclosed; of what it truly means to be human – but what does this realisation actually mean?

To understand the role of disclosers is to acknowledge that the basic structure of human existence is to disclose new worlds – that is to bring about new practices, concepts and ways of being. Through this disclosive process one also finds fundamental structures of meaning in existence such as *purpose, identity* and *will* (Spinosa, Flores, & Dreyfus, 1997; Scharmer & Kaufer, 2013; Heidegger, Being and Time, 2008). This is to say that in finding the *situatedness* of one's being, in one's *being-there,* one can also find what the world is calling one to do, and how it is requesting action to be taken. According to Spinosa, Flores & Dreyfus, (1997) being *authentic* then is the engagement of dialogue that an individual has between, their history and the world in which they are embedded; it is from this point that one must act purposefully. This purposeful action can only be found with the central realisation as "*our role as disclosers"* (Spinosa, Flores, & Dreyfus, 1997; Heidegger, Being and Time, 2008).

The problem is that the surrounding world is taken to be given, objective and inert; a world in which intervention amounts to merely submitting to the *common-sense* structures of reality. This is because an individual does not see that everything around them has been brought about through disclosure; everything is a result of the *creative action* of people just like them. This misapprehension comes about from one specific thing – which is that the practices for dealing with the world are founded in an objective and rational paradigm, where focus is on allowing there to be an objective world to cope within (Spinosa et al,. 1997; Heidegger, 2008). As Spinosa et al (1997) further articulate that:

> "Our practices are designed for dealing with things, not for dealing with practices for dealing with things and especially not for dealing with the coordination of practices for dealing with things." (Spinosa, Flores, & Dreyfus, 1997)

"We do not normally sense that we are disclosers because we are interested in the things we disclose and not in the disclosing (Flores, Spinosa, & Dreyfus, 1998)."

There must be a shift onto the process of disclosure itself, it will possibly lead to a far more richer and purposeful existence and with this the capacity to disclose worlds which are relevant, plausible and contextually viable.

The point here is a somewhat subtle one – it is not that being are not disclosers (for that is undeniable), but rather it is that being are not aware of the ontological structures in which they disclose. Ontological designing then is a design process, which is aimed at unearthing the basic ontological structures of a context; and in this deconstruction finding the basic processes for the emergence of a new ontological structure.

Heidegger claims that a hallmark of Western disclosure has been one of dominance – that is to say that the disposition to the surrounding world is one of exploitation. This is the belief that *Being* are configurations of power, that their focus has been on an expression where they seek to dominate being, rather than to understand it (Heidegger, 2008; Nietzsche & Kaufman, 1968). This in turn, blocks off human sensitivity to the way life and situations are changing all the time; that being becomes unaware of their role as disclosers of being and instead supplant this role to one of dominance.

The attempt has always been to put *humanness* in the centre – not Being itself and thereby trying to gain a kind of conceptual control over Being. This is a false portrayal of beings as subject to human creations where Being is thought of as something, to have control over. Heidegger, (2004) sees all form of philosophical thought as human-centred and anthropocentric, which he claims is wrong. In Heidegger's later works he proposes that the role of the discloser is to allow Being to disclose itself *in itself* rather than to attempt to impose their will upon it.

Heidegger (2008) claims that most of individuals live, according to the *They,* rather than according to their own authentic phenomena of existence. The *They* refers to the way an individual may identify oneself with what others or the public culture thinks about one (what ever *they* think) or simply put, what concepts one compares oneself to. Dreyfus, (1990) explains this concept as Heidegger saying that "we all already do what anyone does, I eat the way I eat, because one eats the way one eats, I pronounce words the way I pronounce, because one pronounces words the way one pronounces words, so that I can be understood."

This also relates to objects of desire, which are wanted or are after (such as money and material things). Heidegger calls this the *das Man* self, which may be

understood as a set of names, categories and labels, for example, " I am a student", or "I am wealthy" etc. The problem is that this conception of self is inauthentic, in that it is not based on individual historicity, or *being-there.* To find authenticity then is exactly the opposite, to find oneself (being) in time (history) – is what Heidegger calls *Dasein* or the essential structure of existence.

Dreyfus, (1990)explaing that this existence known as *Dasein*, when faced with the anxious moment of being where they either flee that moment and conform to what the *they* would accept, Heidegger says, is disowning what it means to be *Dasein.* Heidegger urges, rather that at this anxious moment, one should own up to what it means to be *Dasein*, hold on to the anxiety and create the space to experience an entirely new way of being human. In this authentic activity, one no longer has to respond to the general situation, but rather to the unique situation. Heidegger, (2008), insists that this kind of life of not conforming to the current situation, makes you an individual, makes you flexible and alive (Dreyfus, 1990).

Freire, (2000), insists that " to be fully human, is to have full control over what we do, how we think and what we want to become." Instead of conforming and being oppressed to the societal norms which have oppressed previous actions, one must now, break free from that, and take control. He claims that it is a matter of self-determination and if one does not attain self-determination, they become alienated from their own lives, with no control over their thoughts, creativity production.

Simon, (1969) claims that the act of coping is a movement, whether it is intentional or unintentional, toward a preferable state. Wendt, (2015) claims that this coping, or states of *Dasein*, is what links *Dasein* to design, in the act of adjusting one's surroundings (world) to meet one's conscious or unconscious preferability.

In this way ontological designing begins with the question of being – not only *who I am* (authenticity*);* but also what is asking to *become*. This last point is founded on an acknowledgement of the nature of Being as becoming - what may be referred to as the second question of being: *what is becoming?* It is these two aspects of *being ontological* that are at the heart of the realisation of the role of the discloser.

With this, purpose and meaning are found, and in what is disclosed is the action that *must* be taken. This *commitment* is the necessary condition for disclosing new worlds and new ways of being (Spinosa et al., 2007); further this commitment can only be fostered through an invention within *identity.*

2.5 Commitment

Spinosa, el al., (1998), claim that Human beings are the *way* they are because occurrences have led them to make a commitment to some cause, person, or role with an intensity that cannot be established in any shared terms. These two different accounts of identity seem radically opposed. One says that the sense of identity depends on others and the other says that it depends solely on the intensity of individual commitment.

For Heidegger, (2008) as beings, one always remains subject to the public norms of intelligibility. It is the public view or *they* that one tries to change through their commitment. Consequently, the public view can change in such a way as to make one's commitment irrelevant. It is this possibility that one is always sensitive to that, which enables them to position themselves.

What one may call their identity is split into two different functions: the one they see themselves through the eyes of others, and determine which actions position them in the way that gives them the most credibility; while also interpreting which actions make the best sense of their commitment. This is similar to Albert Bandura's, (1971) concept of social learning theory. Bandura, (1971) claims that social leaning or observational learning is learning that occurs as a function of observing a situation, retaining what is happening in that situation and then replicating the behaviour observed in that situation. Bandura, (1971) extends this term by describing 'modelling', as the manner in which one observes different things, different people and learn how they behave and perform different functions in their everyday reality.

Positioning operates only on the basis of commitment, so it can only cause and individual to give up their commitment if it has become entirely irrelevant or hopeless. Communication is not a process of transmitting information and symbols, but one of commitment and interpretation (Winograd & Flores, 1987). To understand commitment truly, there needs to be an interpretation of what needs to be done.

Since, being is always trying to make commitments make sense to others and themselves, there is a careful control asserted in positioning one's actions. The sense of being over committed is precisely the risk of living in the recognition of others which is experienced today (Flores, Spinosa, & Dreyfus, 1998).

2.6 Designing new technologies

Any opening of new possibilities closes others, and this is especially true of the introduction of technology. In providing a tool, the nature of how people use the tool and the materials within will be changed (Flores & Winograd, 1987). Technology in this broad sense imposes a framework or structure, from which to understand the world. In a sense, this treats all being as resource or inventory a status that covers over the being that is disclosed. (Heidegger, 1977) What Heidegger is saying, is in the modern world, being no longer experiences itslef as it was disclosed in earlier times of human beings. At all times, in history being has disclosed itself and also concealed itself meaning some things are understood and others are not.

Heidegger claims that in this age, there is this new threat to the understanding of being. He believed that Being was shrunk to what is present and the present moment is dependent on the minds ideas. Heidegger saw this as a problem because all understanding of being was dependent on a stagnant moment in an ever changing system, which led to false understanding and concepts being disclosed. Heidegger found that the philosophical tradition destroys the fact that being discloses itself or any possibility of thinking about that in any deep way. An individual's job, or way is to then think that, without destroying or diminishing it. Heidegger (1977) does not mean an one must overcome technology, he does not mean there must be rejection or destruction thereof. Rather this is a reminder that there needs to be an awareness of returning to the concealed truth that technology has covered over. Heidegger acknowledges that technology is itself a creative act. Attending to the creative act of the invention of technology can be a way to understand what lies beneath the technology. Whenever something new is created there is an immediate concern with the created artefact, or with the new technology, that the being that lies under it is forgotten. The technology fascinates being and diverts their attention to pass over without noticing its origin. What is need is not the absence of technology, but sensitivity to what is originally being disclosed by the creation and use of the technology.

Being itself must grant en-framing; Heidegger says the technological en-framing of the world, has itself been granted by being. Being has granted us remarkable new means, in which new ways of being are ignored, by which being is more and more obscured. Heidegger insists that where the greatest mistakes take

place is where the task is to turn that moment into *unconcealment*. The space where one tries to comprehend what has been forgotten and what has been concealed. Technology creates a platform to show each other their dreams, their imaginations or their experiences. Computer gaming can be used as an example; players are immersed and taking part in a series of activities, thought up by a team of humans who have imagined and co-created a world.

Technology is an enabling tool that enables sharing of imagined structures with one another. It allows a clear extension of communication, where others can articulate with each other on an experiential level rather than restricting articulation to the boundaries of language only. Technology allows for a way to share much more of ourselves, and way of being. The heart of this work consists of coordinating human activity within a fold of experience – or ontology.

2.7 Designing Disclosure

This discourse is aimed at bringing two primary aspects into contrast and into accordance. The first is *finding oneself* within the design project – what is the purpose and role of the researcher within the context of intervention. The second aspect is *finding what is becoming* within the area of intervention – this relies on sensitivity to a developmental trajectory or a historical movement into the future. This leads to the reasons and justification for creative action and emotional commitment.

It is the primary role of the ontological designer to first work on oneself, to design the architecture of experience or the ontological structure. To do this the designer must engage in an ontological inquiry and further into an exploration of the epistemological process that emerges from certain ontological foundations. As Flores and Winograd describe:

> "In the act of design we bring fourth the objects and regularities in the world of our concern. We are engaged in an activity of interpretation that creates both possibilities and blindness. As we work within the domain we have defined, we are blind to the context from which it was carved and open to the new possibilities it generates these new possibilities create new openness for design, and the process repeats in an endless circle." (Flores &

Winograd,p.178, 1987)

In this way there is a fundamental similarity between *hermeneutic phenomenology* and the design process – because there is an engagement between dialogue of sense making around basic ontological assumptions and epistemological machinery.

Therefore the most fundamental aim of the designer is in the design of one's own ontological structures, what Heidegger called a return to *thinking* (Heidegger, 1977). This is an ongoing and dynamic disposition to inquire into the ontological assumptions from which one operates. Through this inquiry one can unearth how knowledge is created, or the epistemological implications of differing ontological foundations. This in turn leads to a deconstruction of *style* that facilitates the development of new ways of being – both individual and shared.

In the final reckoning then the designer must aim to design oneself or architect within oneself the openness necessary to disclose new worlds. This process can be called, the design of ones own conceptual processes or the design of disclosure.

2.8 Thematic Analysis

Thematic analysis was used to uncover core patterns within the literature review, circumscribing the boundaries and grounds for an investigation into the experiential and practical dimensions of service model design. This made the conceptual landscape tangible for the researcher, allowing the discovery of key phenomena, practices and relationships; and further to understand how these may apply to this research study. In Encyclopaedia of Case Study Research (Mills, Durepos, & Viebe, 2010), describes thematic analysis as a sense-making approach, to managing large volumes of data without losing the context. He explains the five purposes of thematic analysis: as a means (1) of seeing, (2) of finding relationships, (3) of analyzing, (4) of systematically observing a case, and (5) of quantifying qualitative data.

These five purposes of thematic analysis, allowed the researcher to collect key phenomena, relationships and practices to form themes of significance related to the research topic; The exploration between two roles; the role of the designer in the

creation of technologically orientated human activity systems and the role of technology in creating *new worlds* or ontologies for citizens.

. There were eight main themes that were identified: 1) ontological designing, 2) style and frame, 3) thrown-ness, 4) ready-to-hand and present-to-hand 5) breakdown and innovation of sense, 6) the role of the discloser, 7) commitment and 8) designing disclosure. These themes will be described, in different perspectives according to the chapter it is in, throughout this thesis.

2.8.1 Ontological Designing

This refers to the insight that design must be liberated from the instrumental rationality that has been incumbent on it and that rather what is needed is a reawakening to the design process itself. This is the realisation that; the design of technologies, products and social organisations (such as businesses and public services) are not merely tantamount to designing at the ontic level only (the level of mundane objects), but also have the capacity to engender entire new existential worlds.

2.8.2 Style and Frame

This theme refers to an almost imperceptible principle that underlies and is immanent to everyday social practices. This is of central importance to the work of the ontological designer because the medium of this type of design is the style of a certain practice or organisation. That is to say, the fundamental work of the ontological designer is in unearthing these somewhat embedded axioms or what Heidegger would term ‘metaphysics’ and through this disclosure fundamentally innovate them (Spinosa, Flores & Winograd, 1997; Heidegger, 2008).

2.8.3 Thrown-ness

This is a typically Heideggerrian term that describes the epistemological process of the everyday. Thrown-ness is the insight that one is not always rationally attuned to their reality and indeed, most engagement within the world is embodied (Maturana & Varela, 1980) and non-reflexive (Heidegger, 2008). This is related to style (above) because the style refers to a shared background of understanding that creates the basis of action or what could understood as social normativity (accepted

truth). The role of the ontological designer is to unearth this truth and to work within a social system to create new shared truths that serve that system more appropriately.

2.8.4 Ready-to-hand and Present-to-hand

Building upon a Heideggerrian phenomenology these two analytical tools help to differentiate between the ontic and the ontological (Heidegger, 2008). The ontic is to observe phenomena within what one can call the metaphysics of presence. What are the objective qualities, parts and facts of an object, thing or phenomena; these are the present-to-hand aspects. The ontological in contrast, what Heidegger names ready-to-hand, describes the usefulness, history and 'relatedness' of the phenomena of interest.

2.8.5 Breakdown and Innovation of Sense

Furthering this understanding of thrown-ness, Breakdown is as it implies a break-down of this thrown-ness. This breakdown is instantiated through a fundamental breakdown in the sense-making processes – things don't make sense, some anomaly appears that cannot be adequately explained. This is breakdown is hugely significant because it circumscribes the area of social innovation; it is the very locus of the design activity. The innovation of sense then, is working from this place to construct new meaning, meaning that is centred on a utilitarian and contextual value within this circumscribed space.

2.8.6 Commitment

This theme relates to Heidegger and Husserl's idea that beings are intentional and are always moving towards intentionality, a past commitment which has been made, and is now forming a future path and in so doing, is creating meaning. Commitment in this regard refers to the necessary conditions for action, or the perceptual conditions necessary for action. For example, to describe the conditions in which a certain social practice is observed, this description must be extended to describe the underlying beliefs, commitments and truths that legitimise them.

2.8.7 The role of the discloser

This theme refers to the creative potential of thinking; Human beings, create the world they inhabit. However, as a society, people and species have been systematically cut-off from this potential. To be aware of this is to begin to engage with shared history, the background of meaning of the everyday and actively engage in a transformation thereof. Particularly, this aspect of the research lens points to a "disclosure within our own selves as the discloser" (Spinosa, et al,. 1997). This is Ontological Design.

2.8.8 Designing Disclosure

This theme takes the process of ontological design a step further. This is the understanding that resilient systems require within them the means for adaptivity. Adaptivity is the means of a system to 'become aware' of breakdown and mobilise the means to deal with this, this is a dynamic and self-organising process. Therefore designing disclosure is the process of embedding mechanisms that facilitate an on-going creative organising that addresses the uncertainty of experience. This process often enables situated human cognition to actively recreate the system architecture in relation to emergent needs and therefore, in designing disclosure; there is an embedding of practices that create resilience and self-organisation within the system design.

Chapter 3: Research Methodology

This chapter will describe the methodologies, thinking disciplines and practices used during this study. These will be explained in three areas: 1) the phenomenological process of designing 2) the practical approach taken to create a prototype and 3) The service model that was designed.

3.1) The phenomenological process of designing

3.1.1) Phenomenology: Lens of Perception

The themes identified above constructed the researcher's lenses of perception from which the intervention ensued. That is to say, an orientation towards the research topic that gave meaning to the empirical data collected.

These lenses guided the process, creating a meaningful context for the intervention. The phenomenological intervention itself had three aspects: 1) the encounter with the experience (Husserl, 1970) 2) being present to this experience or sensing emerging potentials (Scharmer,C. 2009 ; Scharmer & Kaufer, 2013) and 3) actualizing that emerging potential through a prospective and simulative engagement with a possible future (Scharmer & Kaufer, 2013; Spinosa et al, 1997; Hofstadter & Sander, 2013)

The encounter with the experience (first aspect) refers to the ontological disclosure (Heidegger, 2008), revealing the disclosive space between the practitioner and the phenomena of study. The second aspect, being present to the experience may be understood through Husserl's method of eidetic reduction (Husserl, 1970; Sadala & Adorno, 2002). This method uses the imagination, or the simulative aspects of the mind, to find the many variances of the described phenomena and through this process uncovers the most stable and invariant aspects of it. The clarity gained through this process forms the grounds for the next process, which is interested in describing a developmental or creative trajectory of this phenomena that is, through an imaginative or abductive (Martin R. , 2009; Austen, 2010; Pierce C,. 1958;

Hartshorne & Weiss, 1958) process which may reveal the understanding of what the phenomena is asking to become (Heidegger, 2008 ; Deleuze, Guattari, & Maclean, 1985; Scharmer & Kaufer, 2013). Often this cognitive process leads to the development of some rudimentary and prototypic knowledge that allows for a dialogue with a future and the present immediate situation. In other words, the development of a prototype.

The aim here is to describe the phenomena of the designing process and what it means to be a designer. In particular the interest is in the creation of prototypes, not to simply create an object but rather to explore ideas in a physical and virtual space, that is it is through making something that one is able to think (Wendt, 2015).

Phenomenology, as discussed by Husserl (2002), is a return to the as-lived world, the world of experience, which as he sees it is the starting point of all science. Phenomenology proposes that a phenomenon be described instead of being explained or having its causal relations searched for, and it focuses on the very things as they manifest themselves.

As this research is primarily qualitative, the explanation of how phenomena are revealed and their meaning in the context is of central importance and shall be described below.

3.1.2) Phenomenological Description

This process is a description of the phenomena of interest that are written, drawn or described in a different manner (such as rough sketches, diagrams and graphs). This phenomenological description aims at capturing the immediate and fleeting experience as a heuristic marker, an insight into some key feature of the design process.

3.1.3) Phenomenological Analysis

After the description has been made, a reflexive process in pursued that aims to reveal the underlying structure of the described phenomena. This analytical process has the following key aspects:

3.1.4) Existential (Sadala & Adorno, 2002):

a) What is the describer's key disposition in the inquiry?
b) What are the describer's feelings, thoughts and emotions – the inner state of the intervener?
c) What does this situation reveal about the describer's own inner state?

3.1.5) The Share Background of Experience (Heidegger, 2008; Spinosa et al, 1997):

a) What is revealed about the historicity and shared background of the situation?
b) What is the ontological structure of the everyday, within this context?
c) What is the equipment, identities and purposes of the context and how are they coordinated in a style?
d) Where are the points of breakdown?
e) What are the key signifiers within this breakdown?

3.2. Phenomenological Interpretation

This process grounded within the phenomenological analysis aims to synthesise new meanings from areas of breakdown. This is a key area in the design process as it is concerned with the field of intervention as a field of becoming – the aim therefore is to reveal the phenomena as emergent and embedded within a field of potentiality. Therefore this hermeneutic process aims at the creation of new concepts whose beginnings are found within the crucible of the breakdown itself. This has the following key steps:

3.2.1 Emerging Potentials: The four stages of hermeneutic interpretation.

a) What is this field as asking to become?
b) In this operation there is a connection to the medium of the social field through empathetic sensing and creative imagining.

    i. What are the explicit and tacit elements?

c) What is obvious in the description and what things are not embedded within a background of history and experience? Most importantly how are these two

dimensions (tacit and explicit) related into a continuum? And lastly how are these revealed through breakdown?

    i. What is the totality of experience trying to be described – the radical cogito (Sadala & Adorno, 2001)?

d) In this case the total stratification of the phenomena including past, present and future is identified. In this operation a holistic and total conception of the phenomena is revealed.

    i. What are those phenomena, which remain unaware to the participants within the context?

e) This furthers the exploration of the tacit, to gain a deeper understanding of the context (Sadala & Adorno, 2002).

f) The hermeneutic judgement – this is the completed interpretation of the experience, however this is a recognition of the interpretative process as a creative one. In this way it aims at the creation of a new sense, that allows deeper engagement and further insight within the context of exploration.

3.2.2 Other Key Descriptions.

a. **The role of the designer:** How does the designer utilize design to interpret, act-within and create worldhood?

b. **Style**: How does the style of the context coordinate activity and how can innovating the style (the overarching practice) reformulate and transform the context.

c. **Breakdowns**: What are the points where participants are experiencing breakdowns? How do these breakdowns inform the design process?

d. **Disclosing new Technologies**: How can technology be the medium of social innovation and service design? Here there is an inquiry into the nature of user experience design and service design to transform the social context of intervention (Scharmer & Kaufer, 2013).

e. **Commitment**: What is the basic truth, perceptions and social norms that coordinate activities and further how can these standing commitments be addressed to transform the context.

3.3 A practical approach to creating a prototype

This section is made up of three sections a) User research, b) Persona's, user journey maps and information architecture and c) Prototype design and testing.

3.3.1 Creating the prototype

User research

The user research methodology is the systematic study of goals, needs and capabilities of users so as to specify design, construction, or improvement of tools to benefit how users work and live (Schumacher, 2010). The user research process includes (Pretorius, 2012): studying people deeply, ideally in their context; exploring not only their behaviour, but also the meaning behind the behaviour; making sense of data using inference, interpretation; analysis and synthesis; and using those insights to point toward a design, service, product or other solution.

> When conducting user research, Smillie (2013) states that:
> "no matter what you learn, you can't go wrong". If convictions are wrong, something new is learnt that helps to evolve thinking and build a better product. If convictions are correct, one has more data to back up these convictions. User research is a "win-win situation and it is never too late to start" (Smillie, 2013).

A combination of focus groups and one-to-one interviews and interviewing in pairs were selected for this user research study. Focus groups and one-to-one interviews are useful techniques for exploring and mapping reasons for attitudes and behaviour, understanding of how target audiences approach issues (Gov.uk, 2014). They also enable participants' reactions being monitored and the moderator to probe interesting issues when necessary. Polaine, et al (2013) have noted that in some instances, one-to-one situations may lead some participants to think they need to say

what they think the interviewer wants to hear. For this reason, they find that consumer research interviews conducted with couples or pairs of friends can be more useful than interviews with individuals because the subjects feed off each other's answers and build on them. If they know each other well, they are likely to feel more comfortable and give genuine answers. While conducting research in Zolani, most of the participants were good friends and often came to the e-Centre together, therefore, interviewing in pairs was a good method to use when interviewing them.

Determining the user profiles. The main target audience for the research included everyday users of the Cape Access e-Centres. The Cape Access programme is aimed at creating a digital inclusivity of the Western Cape province. Managers and trainers (staff) at the e-Centres were also interviewed. Screening questionnaires were used to select participants. The main criterion for selection was based on digital skills levels of participants at each e-Centre and how often participants came to the e-Centre on a weekly basis. The intention was to interview regular members of the e-Centres, to interpret what they were struggling with digitally and in their everyday lives. The study comprised of 40 participants of which 21 spoke isiXhosa and 8 spoke Afrikaans. Participants had the option of speaking in their mother tongue, as a translator was provided, however, all participants chose to speak English. Cape Access programme aims at creating digital inclusion in the Western Cape.

The Cape Access programme aims to further digital inclusion. Digital Inclusion generally relates to the access of technologies and e-services (Seale, 2009). Digital inclusion is about reducing disadvantage in society and addressing, through technology, the needs of those who are marginalised in society (Hache and Cullen, 2009). In order to reduce digital exclusion it is important to understand who the users are. The aim of this study is to further the understanding of these users in the Western Cape. It is for this reason that the age range of the participants is as follows:

18- 20: **4**; 21-25: **6**; 26-30: **3**; 31-40: **10**; 41-50: **4**; and 51- 60: **3**.

Portigal (2013) recommends that "rather than asking people to come to you to be interviewed, go where they are." Citizens were interviewed at the Cape Access e-Centres situated in rural areas in three round of research:

- Round 1: Paarl East, e-Centre (10 participants);

- Round 2: Zolani e-Centre (20 participants); and
- Round 3: Testing in Zolani and Paarl (6 participants previously interviewed).

Each participant was asked to complete an informed consent form.

Round 4 of the research included a workshop with 90 staff members from the different Cape Access e-centres. The focus of this round was to obtain a staff perspective on the reasons citizens visit Cape Access e-centres, the services they need and the problems they encounter. Staff members were briefed and divided into nine groups of 10 people in order to gain these insights. Individuals discussed their observations and shared them with their fellow group members. Each topic was summarised into the top five most important findings. These points were then presented back to the audience members for further feedback. Sangiorgi & Clark (2004) state a successful service depends highly on a participatory approach, which allows the users and the other stakeholders to participate in the design process. By including the stakeholders in the process of uncovering the issues in a collaborative manner, it has revealed a clear understanding of the issues that citizens are facing and need to be addressed by government, Cape Access and other potential role-players, such as industry.

3.3.2 Ethical considerations

This study has obtained ethical approval; the process for this ethical approval is explained in this section. The researcher constructed a screening questionnaire and sent it through to the Cape Access e-Centre. This questionnaire was used for permission purposes and to indicate what sort of interviews would be conducted at their e-Centres. The main purpose of this screening questionnaire was to ask for regular members of Paarl-East and Zolani Cape Access centres for permission to be interviewed by the researcher.

Once the screening questionnaire was completed and sent back to the researcher, the e-Centre managers indicated when the best time was to conduct these interviews. The researcher created consent forms, which had to be signed by every interviewee, before the interview took place. Each consent form states that the interview will be video recorded, a photo of the participant will be taken and notes

will be taken. The form also stated that the participant's identity and media footage will not be shared with the public. It is made explicit that the participant is given the option to opt out of the interview at any time during the interview. The consent form also explained to the participant that the researcher was representing two institutions while conducting research and that both these institutions value their input and will not gain access to their identities or footage.

The potential risks of this study would be a breach in confidentiality, for participants. The other risk would be whether the participants trusted the interviewer and would feel comfortable in sharing their experiences, aspirations and needs. This study would benefit the Cape Access programme and its members, by bringing in more empowering programmes and making it easier for members to empower themselves through the use of technology. This study would also benefit the Western Cape Government, in understanding the potential services they could provide to their citizens. This investigation will provide a solid grasp of the difficulties, with regards to digital technologies; citizens are facing in rural areas of the Western Cape, which will aid in the collapse of digital exclusion in the Western Cape province.

Participant's privacy and confidentiality was maintained throughout this study, the interviewer has made sure that the participant's discussion was only held between the researcher and the participant.

This study has maintained confidentiality in describing the various findings in this study, by creating personas which represent the participants interviewed, by using bought stock imagery as their identity. This maintains anonymity of their identity, by describing multiple participants' findings through fictitious characters called *Personas*. The researcher's observations of the participants were captured through these personas.

3.3. **User research plan and implementation.**

Interviewing can be used in combination with other techniques (Portigal, 2013). There were three types of interview techniques used in this research study, which were: participant observation, one-to-one interviews and interviewing participants in pairs. Polaine, et al (2013) had found that interviewing participants in pairs provides the most truthful feedback. They point out that interviewing in pairs allows for participants to speak more freely about their experiences because they know each other and are comfortable with sharing their views. Interviewing can be

used to help identify what could be designed, to help refine hypotheses about a possible solution that is being considered, or guide the redesign of an existing product that is already in the marketplace (Portigal, 2013). On the first day, no interviews were conducted, Instead, the focus was directed to observing the participants at the e-centre and to the space occupied by participants. Participant observation, or shadowing, provides rich, in-depth, and accurate insights into how people use products, processes, and procedures (Polaine, et al 2013). By initiating the research with participant observation, it had worked well for gaining an understanding of the context, behaviour, motivations, interactions and the reality of what people do from the researcher's own experience.

In order to assess the needs of the participants, the research set out to record their daily routines and practices. Polaine, et al (2013) describe participant observation as a favourable mechanism to gain insights into the latent needs of the target audience. "Latent needs" describe which needs have the potential to be fulfilled but have not been fulfilled, due to the lack of conscious effort. DeWalt & DeWalt, (2010) state that participant observation is a method by means of which a researcher takes part in daily activities, rituals, interactions, and events of a group as one of the means of learning the explicit and tacit aspects of their life routines and their culture. Within this formal definition, "explicit" culture is a part of what people are able to articulate about themselves. Spradley, (1980), explains that :

> "Explicit culture makes up part of what we know, a level of knowledge people can communicate about with relative ease."

The researcher was the facilitator during the user research process. The length of the sessions ranged from 45 minutes to one hour. A laptop was used to capture participant comments and a video camera was used to record the session. A pilot study was conducted with stakeholders of the Cape Access programme. Portigal (2013) recommends that the first interviews should be with the stakeholders of a product. Cost, budget and timelines were determined and agreed to before the study commenced.

Participants were interviewed individually or in pairs, based on their role (staff member or citizen), age and Internet experience. Appropriate research questions were identified to ask during the user research and are illustrated in Table 1. The researcher

used the questions as a baseline and had the freedom to ask more in-depth or related questions as required and dependent on participant answers. Portigal (2013) describes the vital role of "listening" when conducting interviews as the most effective way to build rapport with participants. He further states that one should relate to participant answers with phrases such as "Earlier you told us that…" and "I want to go back to something else you said". This shows that the facilitator is paying attention to what the participants are saying (Portigal, 2013). The results in table 1 are discussed next in the next chapter under the designed future: Thrown-ness.

Table 1: User research questions	
1. (Introduction to the study). A Quick description of who I am and the intention of the study; The purpose of this research taking place here; informed consent form.	2. (Participant background). Tell me about yourself: your age; tell me why you come to this e-Centre.
3. Walk me through the steps you take when you arrive at this e-Centre, from when you walk through the door to when you leave.	4. What do you do at the Cape Access e-Centre? How has this e-Centre helped you in your life?
5. Is it difficult for you to get to this e-Centre, for example: do you have to travel very far to get here?	6. Tell me about the training you have received at Cape Access (if applicable). What have you learnt from visiting this e-Centre?
7. When you use the computers at this e-Centre what sort of information are you looking for?	8. When you look for that information (mentioned in the previous question), are there any difficulties in finding that information?
9. If you could change anything at this e-Centre, what would you change?	10. How often do you come to this e-Centre and how long do you spend here?
11. With all your visits to this e-Centre, have there been any relationships or friendships that have formed?	12. Is there anything you would like to add? Is there anything you would like to ask me? (User participation compensation) Thank them for their participation and time.

Table 1 Lists all the questions that were asked during the research rounds.

3.3.3 Personas, journey maps, information architecture map.

3.2.1) A user-centered approach and design thinking.

Design is closely coupled to, and driven by, early systems analysis activities such as needs, task, and functional analyses. Good interaction design involves early and continual involvement of representative users and is guided by well-established design guidelines and principles built on the concept of user-centered design (Norman & Stephen, 1986).

The epistemological processes undertaken were; user-centered design and Design thinking which were practiced from the research phase until the testing phase of the project to ensure that the product had remained valuable for the user at all times. In the user-centered design process, the focus is on the thing being designed (e.g, the object, communication, space, interface, service, etc.) looking for ways to ensure that it meets the needs of the user Sanders, (2002); Brown, (2008) describes design thinking as a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. User-centered design is a methodology used by developers and designers to ensure they're creating products that meet users' needs (Lowdermilk, 2013; Karat, 1997). Lowdermilk, (2013)further insists that user-centered design ensures that designers and developers of systems focus on the right things: meeting user's needs with proper technological solutions. Karat, (1996), refers to UCD as being an iterative process with the primary goal of developing a usable system, which can only be achieved through continual involvement with potential users of the system.

Deep, user-centered understanding, using the techniques of the ethnographer, is an essential tool of the design thinker. Shallow understanding that is oriented to confirming and perpetuating the current model causes knowledge to ossify rather than move forward. (Martin R. L., 2009)

The user-centered design approach is laid out in an iterative loop below in Figure 2. This loop can go on indefinitely, moving through all the steps in an iterative manner, while basing design and development on the users, continuously.

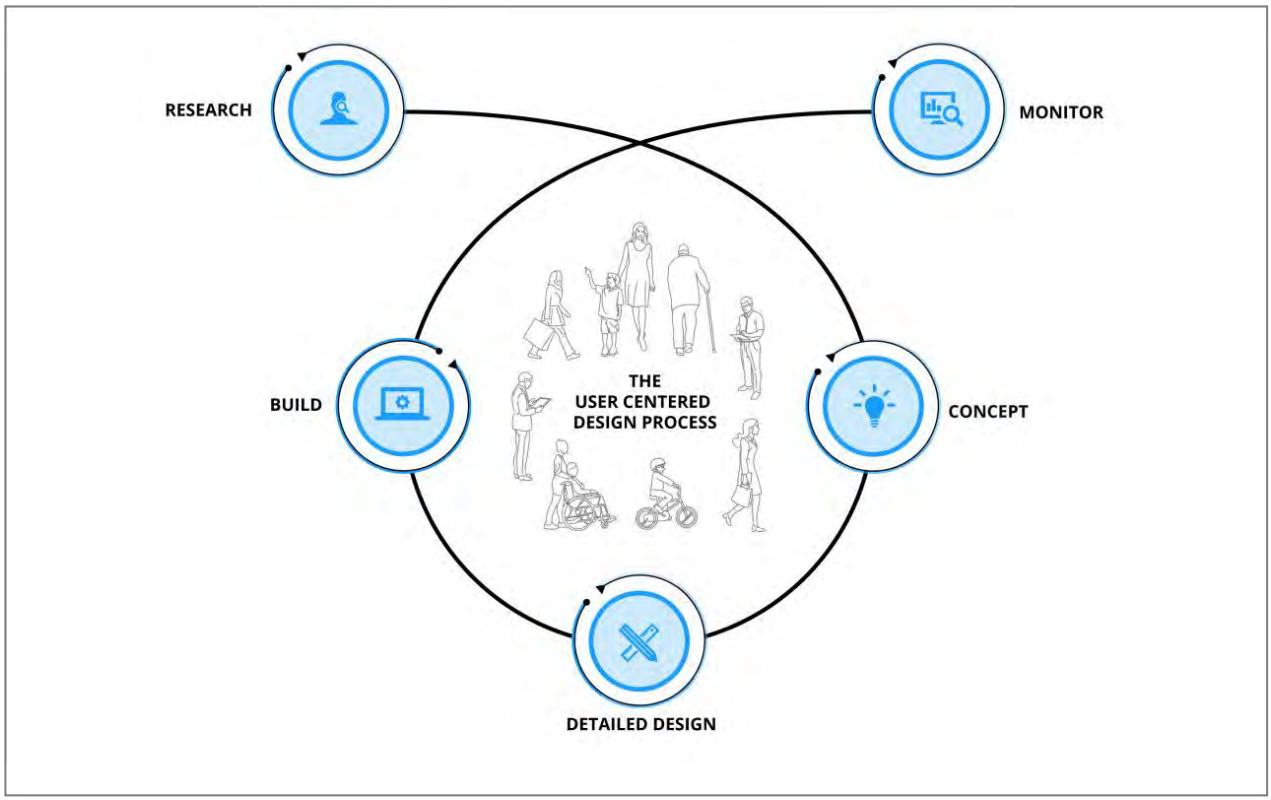


Figure 2. The user-centered design model or loop used in this research study which shows the iterative cycles and stages.

The steps explained in figure 2 explain the process undertaken in this research. It begins at the research phase on the left, research is conducted in the context of interest and data is collected. The researcher begins to analyse and sort data, while the researcher is conducting research and analysing the findings, concepts of how the future solution may work, begin to emerge and become clearer as the process continues. This leads to the next stage which is the concept stage, at this level the researcher deals with the tension of having multiple possibilities emerging, here the researcher must figure out the best fit to implement in the first iteration. At this stage of conceptualising the researcher may go through phases of quick sketching, to think through the arising concepts. This leads to the stage names detailed design, at this level the researcher also works as a practitioner to act on their findings and thinking and extend it into practice. Here the practitioner must deal with articulating thinking into what must be experienced by the end user. This leads to the next stage which is build, at this stage a prototype is built initially which ultimately leads to the actual build of the system. At this level the practitioner needs to define what the interactions of the system will be. Pathways from the elements in the design need to be designed

so that the end user can orientate themselves through the experience easily. Once the prototype or build is created, the system moves through the testing phase where it is tested with actual end users of the system in order to get feedback on whether it will be used by them or what needs to be fixed, this is the last phase of this iterative loop called the monitor stage, this is a crucial step in the UCD process.

The UCD loop is created in this looped to illustrate the fractal manner it is moving through. This might be iteration one, which continues through iteration two, iteration three etc.

3.2.2) Personas.

The results provided in Section 6 informed the development of the personas listed in Table 3. When based on user research, personas support user-centred design throughout a project's lifecycle by making characteristics of key user segments more salient (Bedford, 2015). Themes emerged after the results, and it was possible to create personas based on participants' needs and demographical patterns. The personas represented an articulation of the research findings; they were created in order to have a relatable, tangible expression of the humans who were interviewed during the research period. Wendt, (2015) states that personas play an excellent role in summarizing research results to be spread through an organization with less of a need to dig into raw data. He refers to personas as a way in which designers experience a personal identification to users and a set of characteristics to focus on while designing.

User Journey maps.

The method used for creating customer journey maps, was based on Chris Risdon (an experience designer), from Adaptive Path, who described his method of customer journey mapping in the book titled: Service Design, From Insight to Implementation, (Polaine, et al 2013), refer to this technique as a method, to illustrate the customer journey through a more experiential lens. Therefore, some may refer to this technique as experience mapping.

The researcher went through the process of creating customer journey maps or experience maps, to perceive overarching patterns of activity by users. User journey

maps provide a high-level overview of the factors influencing the user experience, constructed from the user's perspective (Stickdorn & Schneider, 2012).

The personas that were developed after the user research interviews were used to reveal the touch points and interaction spaces that were observed during the study. Stickdorn & Schneider state that when the touch points have been identified, they can be connected together in a visual representation of the overall experience. The user insights generated from the user research had constructed these touch points, showing where users interact with the service. These may take many forms, from personal face to face contact between individuals, to virtual interactions with a website or a physical trip to a building (Clatworthy, 2011; Stickdorn & Schneider, 2012;).

The personas were laid out in lanes that stretched horizontally; this portrayed the path that the persona types had articulated. On either side of this path, the personas needs, motivations, issues and breakdowns were mapped out in accordance with the experience path. This path was accompanied with quotations which revealed the personas exact words at that particular experiential moment. Stickdorn & Schneider, (2013) describe that by "personalising" the map, with photographs, personal quotes and commentary it can communicate the experience as a more immersive user-focused experience. Risdon, (2013) claims that mapping the journey brings understanding of what customers are feeling, thinking, and doing at any given point in time when they are interacting with a service and recognition of how that changes (Cruikshank, 2011; Følstad et al. 2013; Risdon, 2013). This overview should be visually engaging enough to make it easily accessible to all, but should also incorporate enough detail to provide real insights into the journeys being displayed. (Stickdorn & Schneider, 2012).

Cruickshank, (2011) refers to journey maps as a way in which to view complex interactions over time through a visual representation of the customer's experience and allows for problems to show themselves in the context. He claims that journey maps are not only about describing user's experience, but also exposing how they feel about what happens to them in the process. Risdon, (2013) explains that when customer journey maps are done right, maps tell a story with depth and richness around the human experience. He states that by visualizing a story, it is made quicker to comprehend than a few paragraphs. The overview the map enables the identification of both problem areas and opportunities for innovation.

Laying out the information and making it accessible.

The process of organizing the research data into relatable artefacts had revealed more ideas regarding the project. There were more concepts that were all lining up and creating a pull on each other. The research findings that were observed during the participant observation phase alongside the verbal feedback from participant interviews were pulling from the ideas that Cape Access stakeholders had reported, which were adjacent to the specific community feedback. The entirety of these concepts had started to connect to each other, yet also oppose one another and create tension. It was at this moment that a new synthesis began to reveal itself as a cumulative new path of experience, to be designed. Martin R., (2009) has defined this thinking discipline as integrative thinking, which is:

> " The ability to face constructively the tension of opposing ideas and, instead of choosing one at the expense of the other, generate a creative resolution of the tension in form of a new idea that contains elements of the opposing ideas but is superior to each." Martin R.,(2009)

To solidify this new synthesis, the researcher created an information architecture map, to tangibly understand the newly formed synthesis further. Once the personas experiences were mapped out and there was a high-level understanding of these experiences, it made it easier to adjust and arrange the information and the collection of ideas, in a way that was easy for the personas to find. Understanding how your audience thinks about the information architecture is critical (Horton & Quesenbery, 2014). Information architecture (IA) focuses on organizing, structuring, and labeling content in an effective and easy to find path. The goal is to help users find information and complete tasks. To do this, you need to understand how the pieces fit together to create the larger picture, and how items are related to each other within the system. (U.S. Dept. of Health and Human Services, 2006).

A new information architecture was mapped out for the future designed system, which can be viewed in Figure 4. Horton and Quesenbery, (2014), recommend that a designer should look for opportunities to help users make their way through the particular space and provide clear, distinctive landmarks to help them stay oriented.

3. 3.4 Prototype design and testing.

Designing the prototype.

The mapped information began to form interface elements in the researchers head, data had started to transform into interface elements and affordances. These were translated into very basic wireframes. Warfel, (2009), defines wireframes as a visual representation of the functional page structure. They visually communicate what functional pieces are present on a page and their relationship to each other. Wireframes are typically in black and white or shades of grey. In order to create a quick representation of an idea, Wireframes were created to rapidly and visually plan out what to configure in the prototype. Banathy, (1996) defines a change model that includes a "design experimentation and evaluation space" where through prototyping, alternative organizational design solutions are evaluated before a final design solution is reached.

The interactive prototype was created with Uxpin, a web-based prototyping tool, which is used to create interactive prototypes specifically for usability testing purposes. Prototyping is core to how designers do their work. It involves moving from the world of abstract ideas, analysis, theories, plans, and specifications to the world of concrete, tangible, and experiential things (Peter Coughlan, 2007). In creating the prototype, the designer had moved through a phase of configuration. By superimposing the observed reality and their phenomenological understanding of the future solution into a newly designed experience. Herbert Simon (1969), defined "design" as the transformation of existing conditions into preferred ones. He claims that design thinking is then, always linked to an improved future.

The methodology used for creating the prototype was based on Roger Martin's, (2009), *key tools for design thinkers*: observation, imagination, and configuration. The first of the three is observation; this was practiced through deep, careful and accepted observation of the phenomena of interest. Martin, (2009) explains that design thinkers are looking for new insights that will enable them to push knowledge forward and in order to do this; they must be able to see things that others don't. In order for the designer to experience this shift, they are required to perform careful watching and deep listening in a way that is responsive to the subject.

In the book, Theory U, Scharmer, (2009) speaks of listening empathetically, which is when individuals are engaged in deep dialogue. He claims that when listening empathically, perception shifts. There is a transfer from staring at the objective world of things, figures, and facts into the story of a living being, a living system, and self. For Heidegger (1996); Spinosa, Flores and Dreyfus, (1997), they refer to the first design thinkers tool, observation, as the sensitivity of a worldhood which is made up of identities, equipment and purposes.

The second tool of the design thinker that Martin (2009), refers to is imagination. He claims that design thinkers are programmatically able to sharpen their imagination into a powerful tool, encompassing an inference and testing loop. Martin, (2009) further explains this as in order to move from one stage on the knowledge funnel to the next stage, one has to experience it, through observation, data that is neither consistent with nor explained by the current model. When the design thinker is faced with that data, they must make an inference to an explanation, which is a guess that constitutes the best interpretation they can formulate from the data. This inference-making process is referred to as abductive reasoning. Fischer, (2001) explained Charles Sanders Pierce, conceived idea of the abductive mode of inference involves two steps. The first step is the "phenomenon" to be explained or understood is presented (1), as Peirce states it, a "result", which is the derived conclusion in the classical schema; the second step introduces a newly constructed hypothesis (2) from which the case (3) is abduced.

Charles Sanders Peirce claims that the function of abductive inference is:

> "…the process of forming an explanatory hypothesis. It is the only logical operation, which introduces any new idea; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis" (Peirce & Houser, 1998)

The final tool of the design thinker is configuration. This tool refers to translating the idea into an activity system that will create the desired service solution or user value. This is essentially the design of a business or system that will bring the abductively created insight to fruition (Martin R. L., 2009). At this stage, the collections and previous articulations of information begin to form the newly designed experience, which is expressed in a prototype. Warfel, (2009), refers to the

process of when a designer prototypes, they allow the design, product, or service to practice being itself.

Brown, (2009) refers to prototyping as the best evidence of experimentation. He explains that prototyping is not only the finished model of a product about to be manufactured but rather the definition which should be carried back into the process. Brown, (2009), states that prototyping is an essential component of design thinking in this respect. There is the sense within abductive thinking that a designer's work is embodied in acts of thinking and making. In other words, designers produce objects (final or prototypical) that are used to reflect on the process of thinking, which become part of the thinking process itself. It demonstrates how closely thinking and making are (Wendt, 2015).

Testing the prototype.

After the prototype was created, two inspection methods, from Jakob Nielsen's, (1994) heuristics were performed in order to confirm that the prototype was ready for it's first round of testing. These methods are 1) Heuristic evaluation, which Nielsen, (1994) defines as the most informal method, which involves having usability specialists judge whether each dialogue element follows established principles, this is known as the heuristics. The 2) method practiced was a cognitive walkthrough (Wharton et al., 1992; Nielsen, 1994; Lewis et al., 1997), which was performed with Cape Access stakeholders. The cognitive walkthrough method uses more explicitly detailed procedure to simulate a user's problem-solving process at each step through the dialogue, checking if the simulated user's goals and memory content can be assumed to lead to the next correct action (Nielsen, 1994).

The third method used for evaluating the system was usability testing which was tested on participants who had formed the personas in this study. Six participants, who represented six of the seven personas, tested the prototype. Usability testing is a research tool, with its roots in classical experimental methodology, it refers to a process that employs people as testing participants who are representative of the target audience to evaluate the degree to which a product meets specific usability criteria (Rubin & Chisnell, 2008).

The tests were performed as a thinking-aloud study, where users are asked to verbalize their thoughts while using the system. This method has been employed by

usability experts as one of the principal methods for improving user interfaces through testing (Lewis, 1982; Jorgensen, 1989; Nielsen, 1993). (C, 1982) (Jorgensen, 1989). This allowed for a dialogue to occur while the participant experienced the system and reported their feedback. The participants signed consent forms which agreed to the tests being recorded, in two ways, the screen viewed by the participants as well as the participants using the system as they experienced it.

Iteration.

User-centered design and design thinking have been the main thinking disciplines used in this study. These practices have mediated the cognitive biases, fallacies and logical leaps which may have come with individual or collaborative introspection. They have done so by initiating the process to be constantly reflecting on itself; by creating prototypes of ideas in order to examine how designs operate in praxis; and undergo constant iteration and critique (Wendt, 2015). The design protocol that this study has embarked upon has been iterative in nature. This iterative approach is a way of ensuring that users can get involved in the design process, and add in different kinds of knowledge and expertise related to the prototyped system, as needed. (Stone, Jarrett, Voodroffe, & Minocha, 2005). This iterative nature of design can go beyond an understanding of what is and extend itself toward the future states of being, that is it can re-frame existing states to reveal opportunities for improvement (Wendt, 2015).

3.3.5 The Service Model.

The term ‘service model’ is an adaptation of the term ‘business model’. A Business model refers to two concepts: ‘business’ and ‘model’, here business refers to value-generating activities, the equipment that enables these activities, the identities that carry out these activities and the overall purposes they pursue. Spinosa. Flores and Dreyfus, (1997) also refers to ‘business’ as the coordination of these in a style of organizing. A ‘model’ is a way of representing these activities, identities, purposes and their overall coordination.

In relation to a ‘service model’, this understanding of a ‘business model’ transforms to fit in with the intentions of experience design. Experience design deals with the design of experience, which means it is also about designing the things that

are experienced, such as products or services (Wendt, 2015). Therefore, 'service' in this case has to do with, the experience designer, crafting the coordinated experience of the activities, specifically for the identities, which are carrying out these activities in order for them to pursue their purposes or end user goals. The service model is concerned with the relationships between the experience and its representation, attempting to create conditions of possibility for intended results, and to craft clear affordances, which move from essence to external.

A designer examines the natural world and attempts to create future scenarios, eventually designing conditions for those scenarios. Design builds on what is (the empirical) through creative imagining of a future, which the current one asks for or lends itself to. Combining the concepts of Flores, Spinosa and Winograd's, (1997) description of pragmatic activity as being organized by style and Heidegger's, (2008) notion of worldhood, the following framework will be used to facilitate the role of designers:

1. What are the equipment, purposes and identities relevant to the inquiry?
2. How are these organized in an overall style and/or coordination?
3. How are the processed of articulation, reconfiguration and cross-appropriation applied in order to create historical continuous change?

3.4 Limitations of the study

3.4.1 Possible methodological limitations

Lack of prior research on design terms

The researcher found that information around user experience and user interface topics such as personas, user journey mapping or experience mapping and information architecture was difficult to come by. There was a distinct lack of research conducted in these research realms. Information around these topics is lacking due to its recent usage in the design space and is still undergoing a lot of practical testing. The researcher found it relevant for this study due to the phenomenological aspects of this study. In the researcher's opinion, this was the best manner in which to record and adapt these research findings, in order to maintain

truth. These design techniques are utilized in a more experimental manner to transform the designer's understanding of a situation from abstract to tangible, in order for the designer to create a truer representation of an experience.

Self-reported data

Another limitation of this study was that the majority of the data collected was based on participant observations, focus groups and one on one interviews. This method of data collection means that it can have biases from participants, which may affect the richness of the data collected.

3.4.2 Possible limitations of the researcher

Constraints

The two main limitations of this study for the researcher were the constraint of time and the constraint of a certain amount of pages to report back on. The constraint of having to complete this research by a certain due date added pressure into providing a detailed report of the investigated research problem and the limitation of pages that this report is described on, are the major limitations to this study.

Cultural bias

It is impossible to not have your own bias or understanding of the world around us, therefore, a limitation to this study would be the researcher's own bias. Research was conducted in Zolani, which is a predominantly Xhosa-speaking community and Paarl-East, which is an Afrikaans-speaking, coloured community. The researcher has a different cultural background to both of these communities. Therefore, the researcher definitely had a culturally different set of biases while conducting research in these communities.

Language

Another limitation of this study was the language differences in both the communities that this research was conducted in. The pilot research study was conducted in Paarl-East, which is a predominantly Afrikaans speaking community

and the second study was based in Zolani, which is a Xhosa community. This did affect the interview process and the researcher was restricted to only interviewing participants who could understand English. The researcher informed participants that, if they felt comfortable, they could answer in their home language, but none chose to do so. The limitation of language differences was definitely a major limitation of this study.

3.5. Consolidation

This chapter looks at how the phenomenological approach has transformed the experiential (and empirical) understanding of the observed reality, firstly into, prototypic knowledge and then finally into a tangible new technology. In particular, this last step recognises that technology is the very foundational truth or basis for a social reality. Therefore the methodology used in this last chapter is primarily a reflective engagement into the overall design process. This description aims to answer the research question (*what is it?)* and in this way contribute to the growing field of ontological design.

The next chapter will discuss how these approaches and methods have revealed new understandings and disclosed new ways of being.

Chapter 4: Research Findings and Discussion

4.1 Introduction

The results and findings of this study are explained within the context of three perspective phases which were experienced throughout the research phase *(The observed reality)*, the creation of the prototype phase *(The designed future)*, and the reflective understandings which were observed throughout *(Self-disclosure)*. Each theme has a practical output, which will be explained from a phenomenological point of view, reflective angle and a practical point of view. The researcher will refer to direct quotes from participants who were interviewed in this study. To protect the identities of these participants, the quotes will be quoted from the relevant personas explained in this chapter in the section *The Designed Future: Ontological Designing* in table 4. As described in the previous chapter, these personas are made up of a

group of individuals; therefore the quotes used in this chapter are direct quotes from real participants under their grouped persona title.

These three phases are:

1) **The observed reality**, which refers to the phenomena of interest that was observed during the research study.

2) **The designed future**, this phase describes the heuristic phenomenology or the applied phenomenology; this phase will explain how the observed reality was translated into a designed future solution.

3) **Self-disclosure**, narrates the phenomena that were disclosed through the process of designing. In particular they refer to phenomena related to the cognitive processes inherent it the design process.

Figure 3 illustrates how the researcher uses the themes revealed in the literature review and applies them to the three phases of the findings described in this chapter.

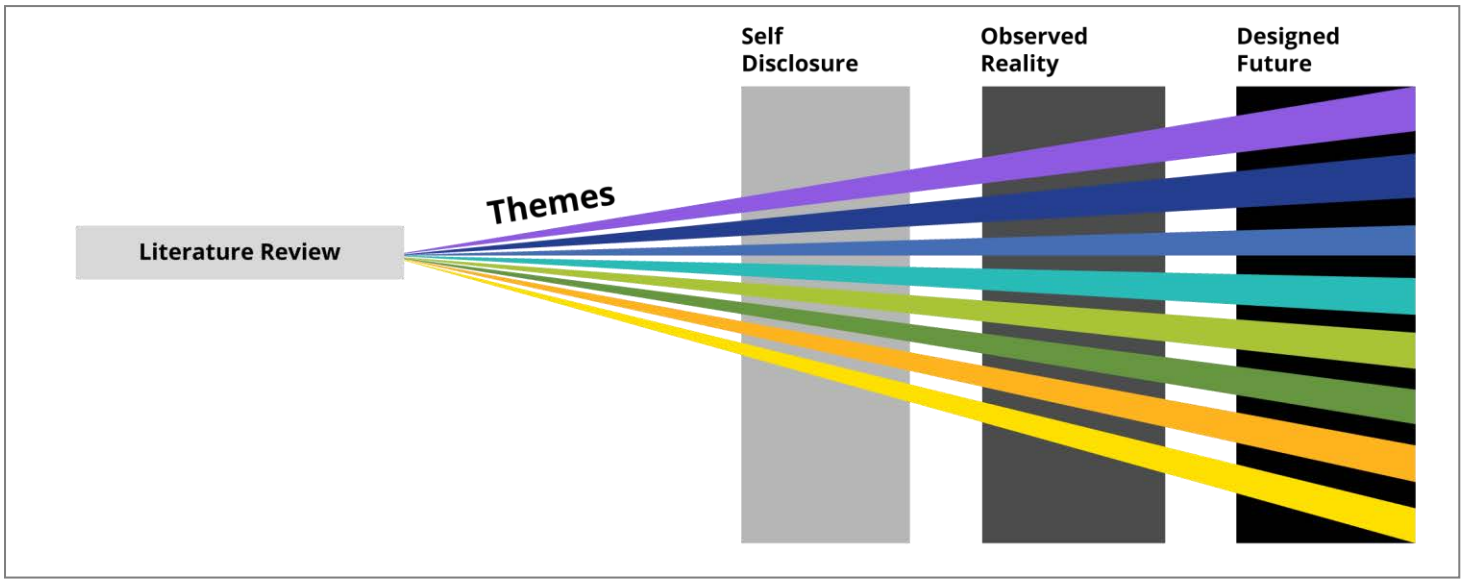


Figure 3. This diagram describes the three different phases from which the research findings will be described.

4.2 The Findings and Results

These findings and results will refer to the relationships between the phenomena or themes observed and explained during this research. This chapter will aim at explaining how the research findings, which have been perceived through a

phenomenological lens of perception of the situation, have formed themes or phenomena. Then there will be an explanation of how these themes, which have been designed into artefacts, and articulate a new style or designed future of the situation. The identified themes are: 1) ontological designing, 2) style and frame, 3) blindness and thrown-ness, 4) breakdown and innovation of sense, 5) the role of the discloser, 6) commitment, 7) designing disclosure.

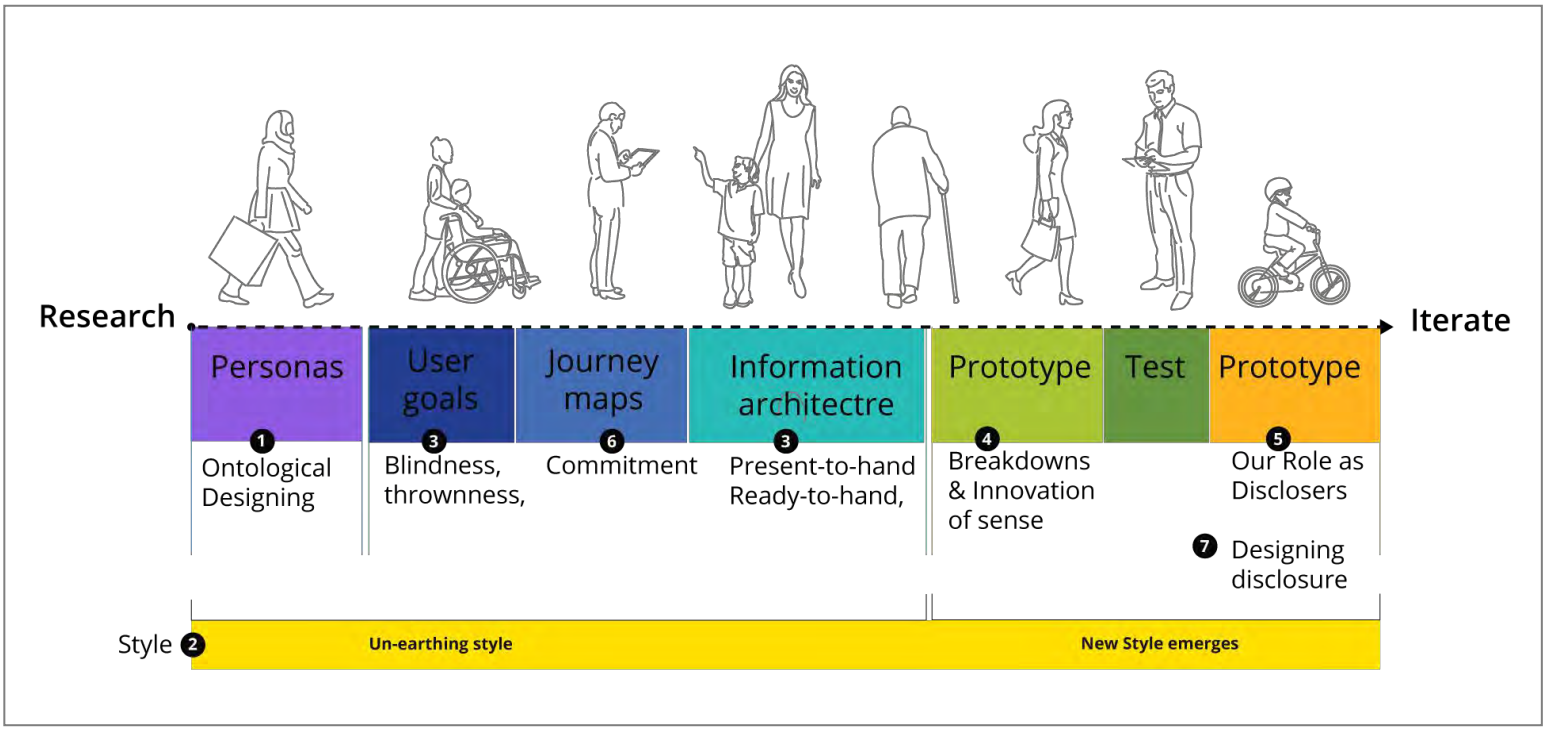


Figure 4. This diagram aligns the research artefacts to the related themes explained in this research

Figure 4 provides a high-level look at the artefacts that were produced during this research study and connects them to the themes that emerged in the literature review. This figure is set along a time line starting at the initial research period and ending at a point of iteration, where these artefacts will go through a process of adjustment in order to fit the context. Throughout this process users and stakeholders are being brought into the creation of the artefacts.

4.3 Self-disclosure

These themes reveal themselves to the practitioner as a new depth to the work of design. This represented the proverbial Copernican revolution, a movement from

design as an inscription into a fundamentally inert matter to a deep listening to the medium of explication – the social reality itself.

Therefore this process necessitates a new epistemology for design. This alternate engagement with knowledge is concerned with a new metaphysics (Martin Heidegger, 2004) and with it a new type of creative logic (Peirce & Houser, 1998; Martin.R, 2009). This creative thinking discipline demarcates the core of what could be called the ontological design epistemology.

This phenomenon then is the realisation of the self as the disclosive space of the design intervention. In other words, the self is like the blank canvas of the intervention and whatever colour begins to emerge here are the emerging potentials of a new social reality. With this, the emerging self is bound and in dialogue with the medium of the social field; sculpting, holding and forming this reality.

4.3.1 Self-Disclosure: Ontological designing.

The starting point of the design process is an event that calls attention away from the everyday practices of life and asks for a renewal of these practices. It is, this emergent phenomenon that makes a few things apparent: firstly, a shared background of experience shows up and reveals a characteristic *blindness* and *thrown-ness.* Secondly, these aspects of thrown-ness and blindness are the reason for *breakdown* in the presence of the uncertainty of an unfolding shared experience. So to the ontological designer the first aspect is the emergence of this dyad of *thrown-ness* and *breakdown.* Through the mindful engagement with these, the designer begins to constitute a 'way-of-viewing' the world – it helps the designer to understand what is significant, what needs to be investigated and understood. In other words, it circumscribes a meaning-space for the design intervention.

4.3.2. Self-Disclosure: Blindness, thrown-ness, present-to-hand and Ready-to-hand, and Breakdown.

Thereafter the designer gathers empirical data through this lens, documenting and collecting fragments of a complete understanding. Through this process, an explicit epistemological process (an ethnographic research operation) is pursued but

more importantly, an implicit or tacit-embodied capacity is developed. This capacity is characterised by sensing an emerging future (Scharmer & Kaufer, 2013). At first this is merely the sense of affirmation, which gradually builds a conceptual and imaginary landscape.

The progressive articulation of this sense into design artefacts is at the heart of the ontological design process. Artefacts themselves represent a development of the prototypic knowledge of the designer into clearer more definable terms, within the context design intervention. The quality of the prototype may be understood in its affective capacity, that is its ability to generate further insight into the phenomena of interest through an open ended dialectic between the innovator, the context (social, symbolic and material) and the prototype.

4.3.3 Self-Disclosure: The Role of the Discloser.

This creates a development process that is based on a continuum of development rather than a discrete end point. The ontological design process is one that is open. The role of the ontological designer is in creating a set of system axioms that allow for growth, self-organisation and support the emergence of system values (for example, inclusivity, sustainability and creativity).

4.3.4 Self-Disclosure: Designing disclosure.

This phenomenon relates to the capacity of the designer to build resilience within the system. Therefore, the cognitive processes involved here are not with developing features of a system, but embedding an epistemology of adaption within the system. Taking a distinctly cybernetic approach (Banathy & Jenlink, 1988) which shows an interest in the interaction between systems (user, interface and network) as based on feedback within a linguistic domain (between systems).

To engender resilience the designer must develop the system rules that allow for adaptivity and growth, and therefore must design disclosure. This concept is somewhat akin to self-awareness. Through an awareness of local and global phenomena the system may self-regulate in relation to perturbation (Winograd & Flores, 1987). The notion of autopoiesis is often associated with that of self-organization; that is, with a system in which the elements create and re-create themselves (Scharmer C. O., 2009).

4.3.5 Self-Disclosure: Commitment.

Winograd and Flores, (1997) regarded technology and software to be a medium through which commitments are being conveyed between programmer/designer and user. The designer needs to understand the commitment users are making in order to successfully articulate it in a manner that is meaningful for the designer and which brings out meaning for the user. More specifically, the goal of the designer is to understand how users interpret their own involvement within the world as a meaningful activity (Wendt, 2015). In this regard, there needs to be a common understanding of what is meaningful, for all roles or identities who are a part of the Cape Online system. Meaningful activity or commitment will need to be clearly agreed upon between stakeholders (Cape Access programme manager and Cape Access staff members), designers and researchers of the system (Western Cape Government user experience team lead and designers) and citizens (Cape Access current members and potential members of the e-centres provincially). For the purposes of this study, the commitments lie in different realms; 1) political commitment, to allow digital inclusion to the Western Cape. 2) Economic commitments, to create more employment support to rural areas in the Western Cape and 3) the personal commitment of the designer, which is to investigate the phenomenological approaches of designing inclusivity

4.4. The Observed Reality

4.4.1 The Observed reality: Ontological Designing.

This section will consist of describing a few of the concepts explained in the literature review. To understand the observed reality from an ontological point of view, the study needs to uncover multiple observational aspects:

1. What are the equipment, purposes and identities relevant to the inquiry?
2. How are these organized in an overall style and/or coordination?
3. How to apply the processes of articulation, reconfiguration and cross-appropriation

in order to create historical continuous change?

A worldhood, according to Heidegger, (2008) is made up of three main characteristics; *equipment*, which is what is used to carry out certain tasks. These tasks are executed in order to achieve certain *purposes* and lastly this activity enables those performing the task to take on certain *identities*. These identities are the meaning or point of engaging in these activities (Spinosa, Flores, & Dreyfus, Dsiclosing New Worlds, 1997).

The worldhood revealed in the observed reality was made up of these same elements. The e-Centres were both situated in knowledge centres. The Zolani e-Centre was in the municipality library and the Paarl East e-Centre was in the Paarl East Thusong centre. Thusong centres are a Western Cape Government initiative, which aims at primarily developing communication and information skills, to integrate government services into primarily rural communities. The Cape Access e-Centres are situated within these buildings so that communities may have easy access to the provided centres.

The setup of the e-Centres consisted of similar sets of equipment which were laid out slightly differently.

In the Paarl-East e-Centre, there were two rooms, one was set up with neat rows of computer cubicles with a front desk where the e-Centre manager was situated. Paarl-East e-Centre also had a separate training room where they ran their basic computer training courses. The computer cubicles used long connected desks and were each set up with a computer on each desk, a chair, keyboard and mouse. All the computers were equipped with computer software such as Microsoft office, relevant browsers and windows software. This centre was fairly new and the Cape Access branding had been maintained carefully, for example the walls were white with a blue large Cape Access logo on it.

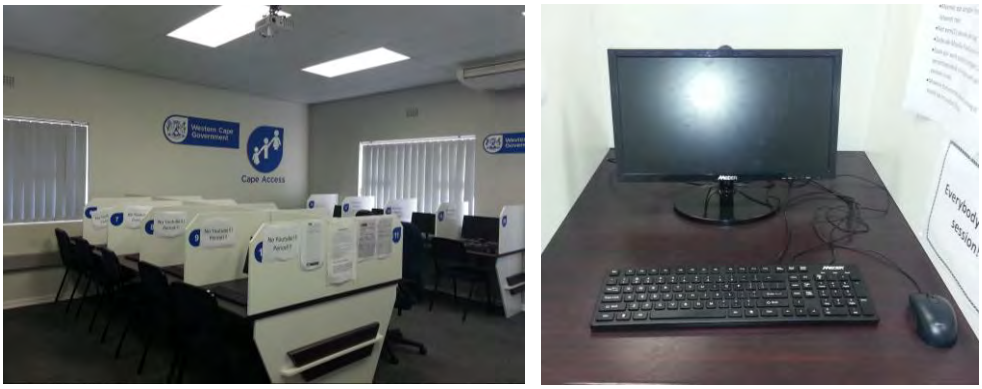


Figure 5. Photos of the Paarl-East e-Centre

The Zolani e-Centre was set up within the community library centre. It occupied one large room in the library with desks along the walls of the room. These desks had computer cubicles placed along them with chairs, keyboards and mice. All the computers are equipped with computer software such as; Microsoft office, relevant browsers, windows software. At the entrance of the room on each side were two desks for both the e-Centre managers. The only branding that was present were two elongated banners on the one end of the room.

Figure 5. Photos of the Zolani e-Centre

This observed equipment enabled members to achieve certain tasks, such as creating a Curriculum Vitae, searching for information on the internet, printing out documentation, participating in computer training and creating online accounts (e.g email, Facebook, Google and LinkedIn). These tasks are executed in order to achieve certain *purposes*.

The purposes of these tasks that were observed are related to the participants interviewed at these e-Centres, most members had reported that they came to the e-Centre to look for jobs. An unemployed female participant, also referred to as

Andiswa in the personas who was job seeking on a daily basis, described that " When I arrive at the e-Centre, the first thing I do is open up all the job sites that I know about and start applying for jobs."

The e-Centre managers of both the Paarl-East e-Centre and Zolani e-Centre reported that most participants had understood how important learning new digital skills and maintaining their knowledge of digital skills by practising what they had learnt. The Zolani e-Centre manager, represented as the persona Simphiwe proclaimed, " most of the people that come here can see that they are learning how to use computers, and how it helps them, first to communicate, then to begin to apply for jobs. There are a few people in my community who have applied for jobs here and been successful."

One of the purposes, for individuals supporting their own businesses, was to maintain their business processes and grow their knowledge base regarding business information. An older male member from Zolani, represented as the persona Joseph explained " I am looking for ways to learn about the basics of business, I have made some mistakes, that have cost me, it would help me to know how to prevent this from happening. I would also like to learn how apply for a business tenders through government platforms."

College students and matric students from both Paarl-East and Zolani had stated that the e-Centres assisted them in finding information regarding their assignments and studies. The persona referred to as Mandy, a female student from Paarl-East, described "I come to the e-Centre three times a week, most of the times I come here to research information for my studies and print out notes to look through at home."

A few participants reported that they often find government support and services when they come to these e-Centres. A male matric student represented as Mafu in the personas reported, "I have been looking at government websites lately to find a bursary, which can help me find a financial support to study at a university in the Western Cape."

Participants showed a keen interest in using their own time on the Cape Access computers to learn digital skills, yet they didn't know where to go to support this self-learning process. Rodney, who is described as a male security guard from Paarl-East e-Centre had reported that he was passionate about learning sound engineering, and he had wanted to share his knowledge with his community, he also

explained " I want to be able to learn more about my passion, so I can use it to earn a living." Joseph, an elderly member of the Zolani e-Centre said " It's difficult to get a lot of assistance from the managers of the e-Centre, because they have to help everyone, they can't spend too much time only helping me create a business application." Other members reported that often, managers were busy teaching or helping others with their CVs or applications and that they were not always able to help all members utilise their online time to learning digital skills. All participants interviewed in this research study had reported that digital skills would be an initialiser to them living a better life and in turn improving the well-being of their communities.

Maintaining an aligned approach between citizen value and business value, the researcher will also describe the purposes from a business point of view. In this case, from the Western Cape Government's observed point of view are:

The main purpose of the Cape Access initiative was to reduce digital exclusion and increase digital inclusion in the Western Cape province. In order for this purpose to be supported there needs to be better connectivity maintained throughout the Western Cape and most importantly in rural areas. This is the second purpose of the Cape Access programme from a business point of view. These purposes all fit into the next purpose, which is to create better accessibility to digital services for all citizens of the Western Cape. Ultimately all these goals or purposes are to be set in place to help small businesses make use of information technology and data and to facilitate better educational environments and easier access to supporting information for educational growth. The Cape Access business purposes mentioned above all fit together to create a space for citizens in rural areas to have access to technologies and personal support to apply for employment and government services.

These *purposes* stated above will enable those performing the task to take on certain *identities*. While observing the phenomena of interest, patterns of practices began to reveal themselves as *identities.* These identities were grouped into several personas, which describe the demographics of the identity, the end user goal at the current time of observation and the overall needs of these personas. Table 4 explains the articulated identities in persona format. Table 4 provides six different personas (fictional characters) based on the user research. These personas represent the major user groups, goals, needs and expectations that were uncovered in the research study; and explicitly do not cover every conceivable user (Grudin and Pruitt, 2002).

4.4.2 The Observed reality: Style and Frame.

According to Spinosa, Flores and Dreyfus, (1997) Style acts as the basis from which practices are preserved and also the basis from which new practices are developed. Therefore, style is the manner in which meaning is perceived in human activity. The style observed in the current context was revealed from the practices of participants of the e-Centre. These practices are related to the above-mentioned purposes and are concerned with the motivations from which they are initiated.

These practices were predominantly based on the main style which correlates directly with the cardinal spirit of Ubuntu as expressed in Xhosa , as *Umntu ngumntu ngabanye abantu* understood in English as "People are people through other people" and "I am human because I belong to the human community and I view and treat others accordingly " (Chaplin, 2005). This style observed was apparent in member's goals and motivations, yet it was a not yet enacted reality. The underlying motivations and outlooks, which participants had expressed, were that of community wellness, or creating opportunities for everyone in the community, rather than just wellness and opportunities for oneself as an example one of the older male participants had said that they " focus on creating businesses that can thrive in my community, so that I don't have to leave my home and I can help others by giving them a job, that's what I am trying to do." Mafu, a matric student claimed, " I want to work hard, so that I can show the people of my community that they can do well, too. I study hard at this e-Centre and teach my friends, and my friends teach me the subjects that I am not good at, we help each other to learn how to be better." He went on further to say that " It is difficult to make it here on your own with out any help, I have to ask my friends and family for help."

It had felt like these individuals did not have the right tools to act on their understanding or meaning. Instead what was observed in the practices was a style of oppression, or a feeling of not being good enough, or not having the right skills to reach success. While interviewing participants, a few communicated that they wanted to just find a basic job to get by. When asked what their dream career path would be some participants would report that they didn't know and would resort to something like " maybe becoming a nurse?"

The younger participants, 18 – 25 years old, had been a lot more positive in their outlook and belief. It seemed like they were closer to carrying out the style of

Ubuntu. The matric students who were interviewed had all said that they always study with their friends, and help each other out with their subjects. A distinct example to draw upon here is from Mafu when he said " I am currently completing my matric at a boarding school close to my community, I know that I am receiving a better education than my friends. I have started a study group with my friends so that I can share what I am learning, so that together we can help each other understand what we need to learn to get a good matric."

A few of the college students had said that they often stay at the e-Centres a bit longer so that they can assist the children with their homework or learning new digital skills. This recognised style of Ubuntu needed to be unearthed and made accessible to members of this e-Centre, in order for them to construct and act within a meaningful understanding of their reality.

4.4.3 The Observed reality: Blindness, thrown-ness, present-to-hand and Ready-to-hand, and Breakdown.

> "Once we become habituated to a style it becomes invisible to us and we find it difficult to change that style." (Spinosa, Flores, & Dreyfus, Dsiclosing New Worlds, 1997)

Blindness and Thrown-ness.

Spinosa, Flores & Dreyfus, (1997) state that style governs how anything shows up for us; it is the ground of meaning in a shared background of experience, to understand this style, the designer needs to observe the current thrown-ness that shows up in the current context.

The apparent understanding of the situation was that participants of the community were thrown into feeling disempowered. They had become habituated to being excluded and feeling a lack of confidence. In conversation with participants, most members mentioned that they were learning new digital skills in order to first gain menial jobs, such as administrative clerks or receptionists, in order to study further and work as a policeman or a nurse. An unemployed female from Zolani, reported, " I am learning digital skills so that I can be employed at the local factory." They were thrown into the idea that they could only pursue one career path, for example the same participant named above, had reported " I would like to study to

become nurse, once I find a basic job. I have seen other members get a job as a nurse in other areas."

Participants had shown thrown-ness towards a certain understanding of business and entrepreneurship. During the research at the Zolani e-Centre, only older men had mentioned starting a business, furthermore their idea of business was only limited to agricultural business such as farming, building materials and tools to support agricultural activities. There were three businessmen who had been interviewed during the research and when the researcher asked the e-Centre manager if there were any businesswomen in the community the manager reported that there were none. Female participants had mostly described that they were either interested in working or studying, none had reported that they wanted to start a business. It was apparent that members of Zolani e-Centre had been thrown towards the understanding that business was only practiced in one field of interest, the archetypical businessman was a farmer or construction worker and members had become habituated to this understanding of business.

In terms of educational thrown-ness, when participants had shown an interest in studying, they had immediately mentioned that they could not afford the cost of education. For example, Andiswa had reported, " I can't waste my money on studying, I have to feed my child. All my time is used to find a job that brings in money. At the moment I come to this e-Centre and partake in the courses available so that I can learn skills to help me find a job, but I do enjoy it." This was recognized as the habituated nature or thrown-ness of giving up, or not seeing themselves as being worthy of opportunities or not seeing a way in which to transform the current situation. When asked if they were aware of bursaries or scholarships available, participants had overlooked the idea. Some said that they would not be able to apply for funding or be given an opportunity to enrol in the degree of their choice.

Some of the senior participants at the e-centres had communicated that when it came to typing up documentation or sending an email, they would first go straight to the e-centre managers to ask them for assistance, before trying to do it themselves. This is a *shared thrown-ness*, which shows up between the manager and the elderly member, they have almost formed a shared habituated understanding that they will not be able to perform the task, because they are of a certain age. The elderly members who had reported that they often just ask the managers to perform their tasks for them and that they often said that they felt embarrassed to ask the basic

questions, or that they felt that they would be too slow and take up too much time in front of the computer.

These apparent modes of thrown-ness around employment, career paths, education, business, entrepreneurship and digital skills development have revealed areas from which the designer can adjust and design more effective practices. The perceived thrown-ness revealed that participants' understanding of self with regards to opportunities and reaching their goals had been dampened. They had become so unaware of this thrown-ness that it had been invisible to them. Wendt, (2015) claims that this bleak conception that Heidegger points out of everyday existence as "thrown" is alleviated by design. As Wendt, (2015) states, "As we move through everyday life, we change things in our environment." This ranges from small changes, such as putting on the air conditioner to make it cooler, to moving to another city or country, there is a constant adjustment made to an individual's surroundings to better fit their needs. In this way, there is a constant redesigning of the current state in order to better meet the needs of the individual by asserting control over their place within the environment (Wendt, 2015). Individuals un-throw themselves in order to find a home and make a comfortable place for themselves to live. The act of coping is not simply sacrificing; it is a movement, intentional or unintentional, toward a more preferable state. This altering from non-preferable to preferable is what links design to Dasein (Wendt, 2015). It is for this reason that the link between thrown-ness and user goals as a practical output has been made.

The researcher made notes as the participants were being interviewed, in order to provide provisional results to stakeholders as quickly as possible. Themes of the findings were categorised after each round of interviews. Video recordings of the sessions were captured and reviewed. Common themes and results were captured in a Microsoft Word document. Table 2 illustrates the main findings from the research rounds according to themes and main observations. These results directly informed the defined user goals, which are later seen in the personas section. The main themes found were: Online profiles; jobs and unemployment; business and self-employment; education; e-centre training; gaining digital skills and finding online resources; empowering the community; and other activities.

Table 2: User research resulting in the following user goals

Online Profile	The majority of participants had said they didn't really have a space where they could store their information or track their digital progress. Participants reported that they would like a place where they can store their important documentation, where other people can't access it. Currently, participants have to store information on a folder in the computer, where everyone can access it or delete it.
Jobs and unemployment	Participants highlighted searching for jobs as one of their main reasons for visiting Cape Access e-centres. Local jobs websites (such as Careers24 and CareerJunction) as well as the WCG (Western Cape Government) jobs portal are used. In order to apply for jobs, they also create and update their CVs. Staff members spend many hours assisting citizens to create and type CVs, as most new citizens do not know where to start. Participants also search for career advice, such as the different career paths. All unemployed participants, had shown that they needed some assistance and advise with creating CVs.
Business and self-employment	Several participants had their own business or were in the process of starting a new business. They used the Internet to find information on labour laws, government tenders, business programmes and SARS. Selected e-Centres started to provide assistance in terms of business templates, such as invoices and quotations, based on the overwhelming requests for such assistance. Many participants with their own businesses use the e-centre to do their administrative work. Participants use the Internet and the e-centre to search for funding assistance for their businesses. Participants who owned small businesses highlighted that they often struggle to find information on how to start and run a business. A definite user need expressed here, easily accessible business application forms for government tenders and funding and business and entrepreneurship learning programmes.
Education: school	Students mainly use the e-centres to work on their homework and print assignments. Matric students use the Internet to find past exam papers and information for their projects. Many young students (five matriculants and three college students) had said they didn't know what they needed to do to pursue specific career paths, such as what are the required subjects etc. The matric students not only came to the e-centres to find information online, but also to learn from other matriculants in the community and teach each other's in study groups.

	Matric students displayed a need for educational support when it came to gaining good marks and having access to information for studying when they needed it. They also needed more information on what their possibilities were for after matric.
Education: university and college	Participants mainly used the Internet to search for where to study and what to study. Matric participants search for career paths and information on how to learn certain skills, some matriculants searched for bursaries and internships, which also may influence their career paths. Current students use the e-centres to work on their assignments, as well as to print and submit assignments online. The user goals are similar to the above section.
Training provided at e-centres	Some participants completed or were in the process of completing the free training (e-Learner and ICDL courses) provided by Cape Access. Participants undertake training to gain more e-skills. Improved e-skills assist them to find employment; improved career paths; and to pursue university education. A few participants were not aware of training courses available at the centre. Employed members had mentioned that they would like to attend training courses, to improve their digital skills, yet they are unable to attend, because courses are held during working hours. Several participants asked, "what will come next" after completing the two courses offered. They found it valuable and want more such opportunities. Staff members had the need to continually strengthen their e-skills and knowledge, in order to improve their assistance to users. There is an urgent need to grow digital skills, from the e-Centre members point of view as well as from the staff point of view.
Gaining digital skills and finding online resources	The e-skills of participants ranged from the category of some having no skills to others having "high" skills. Most participants had the motivation to improve their e-skills. The participants with none to low e-skills felt that the training would open up more opportunities for them in life. Elderly members of the community would often rely of the managers to assist them with their online work. There were a few members who reported that they were not able to type or use a mouse and relied on the centre managers to help them. The majority of participants visited the e-centres at least 1 hour per week. Not all participants used the available e-centre training to obtain e-skills;

	participants also included those that taught themselves digital skills. Many participants had communicated the need to grow their own digital skills in their own time, in other words there was a need for enabling members to be given the tools to pursue self-learning.
Empowering the community	Participants also noted that the e-centre and free Internet "keeps the people off the street" and helps members (especially the youth) to spend their time effectively. A few participants had said that there was a need for more activity creating centres in their community, to enable more empowerment to the community.

Table 2 provides an understanding of the user research which formulated the user goals.

The findings described above are expressions of Heidegger's fundamental aspect of his discourse, which emphasize the state of thrown-ness as a condition of being-in-the-world. According to Heidegger, (2008) and Winograd & Flores, (1987), individuals are always engaged in acting within a situation and do not disengage themselves and function as observers.

Present-to-hand and Ready-to-hand.

Heidegger insists that objects and properties are not inherent in the world, but arise only in an event of breaking down in which they become present-to-hand (Winograd & Flores, 1987). As an example this is experienced today with use of mobile phones, when there is a communication with someone through instant messaging. To the person typing out the message on the phone, the phone (or even the application) do not exist, they are invisible. It is part of the background of readiness-to-hand that is taken for granted without explicit recognition or identification as an object. Here Heidegger, (2008) would refer to the phone as part of the person using the phones world, and is in some ways as present as the persons hands doing the typing on the phone.

The phone presents itself as a phone only when there is some kind of breaking down or *unreadiness-to-hand*. Its phone-ness emerges when something goes wrong, such as the phone falling or slipping out of the personas hand, or if it is lost. Observers, may talk about the phone and reflect on its properties, but for the person engaged in the thrown-ness of unhampered typing, the phone does not exist as an

entity. In anticipating these forms of breakdowns, designers must deal with the phenomena causing the breakdown, in order to manipulate it and transform it to better fit the user's world. Therefore, these breakdowns are very important to the designers in order to design worlds that are meaningful for potential human action. Heidegger insists that it is meaningless to talk about the existence of objects and their properties in absence of concernful activity, with its potential for breaking down (Winograd & Flores, 1987).

In the observed reality, the researcher had notice that participants with low digital skills were experiencing *unreadiness-to-hand* when they used the equipment at the e-centres, for example, they had not yet become comfortable with using a mouse, their movements of the mouse on the desk did not seem natural or like an extension of themselves. A few participants reported that they did not know how to type, in particular Joseph explained " I don't know how to use a mouse or type on the keyboard, so I ask the manager to type up my documents."

Heidegger claims that being-in-the-world is not a detached reflection on the external world as present-at-hand, but exists in the readiness-to-hand of the world, as it is unconcealed through action (Winograd & Flores, 1987).

Breakdowns.

This section will highlight the breakdown of the above-mentioned thrown-ness discussed. These breakdowns are extremely significant to the designer, because they are the very means of direct feedback from which to iterate and adjust from to construct new meaning. This can be compared to when the designer (or researcher of this study) had entered a moment of breakdown within their own career as a user experience designer, they had reached a point where the path chosen had stopped working for them and they were directly facing a *breakdown*.

Winograd & Flores, (1987) refer to 'breakdowns' as the interrupted moment of individual's habitual, standard, comfortable 'being-in-the-world.' They state that breakdowns serve an extremely important cognitive function, revealing the nature of the practices and equipment, making them 'present-to-hand' to us, perhaps for the first time. It is for this reason that they serve as a positive expression rather than a negative way.

> "When equipment malfunctions, Heidegger says, we discover its unsuitability by the 'circumspection of the dealings in which we use it,' and the equipment thereby becomes 'conspicuous.' 'Conspicuousness presents the available equipment in a certain unassailableness.' But for most normal ways of coping, so that after a moment of being startled, and seeing a meaningless object, we shift to a new way of coping and go on." (Dreyfus, 1990)

Table 3 describes the breakdowns that were observed during this period and are explained in relation to the user goals described as the thrown-ness. Understanding the nature of the breakdown helps the researcher understand the thrown-ness observed within participant's current context.

Table 3: Breakdowns revealed through user research	
Online Profile	Computer sessions ended, each member had been given a 45 minute session, often they would be in the middle of an application for a job, or funding. Some members mentioned they would often just get used to using the computers to complete their CV's or learning a digital skill, and the computers would log out without saving their work or without completion of the task, which caused member's to lose their work. There is no way to pick up where they ended off. There is no way to track what I've learnt.
Jobs and unemployment	Participants reported that they often didn't understand some terminology on job posts, or didn't understand what was required in order to apply for certain jobs. Not enough job knowledge or resource information available.
Business and self-employment	Businessmen reported that they would often not have the knowledge base or skill set to get through an online application in time before the application hand in date, which meant they had missed out on a lot of crucial business opportunities. Not enough business knowledge or resource information available, lack of time in their online sessions.
Education:	Lack of time in the computer sessions and during the week, prevent students from researching in any depth.

	Lack of time.
Training provided at e-centres	Most of the members who were employed needed basic computer training. Often digital skills were required for the jobs they moved to or were hoping to move into. The major issue here was that all the computer classes were taught during working hours, which they were not able to make. No training available for employed members.
Gaining digital skills and finding online resources	Managers noted that they would repeat information often, making it feel like they were not growing digital skills. As an example, members would often enquire about the same queries that other fellow members would have asked earlier. This makes it difficult for managers to maintain motivation and interest into growing the skills of their community. Repetition of queries and issues with members. Cape Access staff are in need of more time for their own training.
Empowering the community	Members often didn't feel like they had the ability, or believed that they could gain the ability to better their digital skills. For example, members who couldn't type, asked the e-Centre manager to type up their CVs without attempting to try type it themselves. This came from not believing that they could, from being thrown into feeling disempowered or excluded. Members do not have access to the correct tools to help them achieve their goals, and therefore, easily give-up.

Table 3 explains the areas of breakdown during the period of observation.

This table describes the apparent breakdowns in the current context. In the next section, these breakdowns will be discussed in relation to how these observations have enabled a readjustment of breakdowns to produce iterative versions of the designed future prototype.

4.4.4 The Observed reality: The Role of the Discloser.

This section refers to the role of the discloser and the act of continually disclosing new realities. This relates to the creative potential that thinking has upon perception of the reality that is being experienced and designed. In this study, in order to design disclosure, it is important to investigate the shared history or the background

of the everyday in order to actively transform the human activity of the current concern.

In the observed style and frame section, it was mentioned that participants had revealed the style of Ubuntu, yet they had not had the tools to act upon this style. The user goals that were discovered had revealed that they had been thrown towards disempowerment, exclusion and self-doubt, this had shown up in needs of the users, such as: being able to freely access the technologies; jobs and unemployment; business and self-employment; education; e-centre training; gaining digital skills and finding online resources; empowering the community; and other activities.

This thrown-ness and style are the grounding means from which community members construct their shared history and from which they assert control over their perceived reality. It is at this level where there needs to be a deep transformation that takes place in participants. It is here, that members are constructing their understanding of themselves and their abilities, from which they are mirroring that self-understanding onto their community members.

At this level, all members inclusively need to have the ability to empower themselves to be transformed, to be motivated and most importantly to believe in their ability to reconstruct, or as Heidegger (2008) calls it, to assert control over their own reality in order to transform themselves (Freire, 2000; Heidegger, 2008; Scharmer, 2009) and their communities.

The manner in which, this can be transformed is on an experiential level, in other words where thinking can be actualised into tangible results.

4.4.5 The Observed Reality: Commitment.

Commitment, here relates to intentionality, which in turn forms future paths, which then create new meaning. In order to design a system that facilitates this creation of meaning, it is important to understand what participants view as meaning or what their intentions are in the current context.

As discussed, there was strong determination surrounding the intention to build up their own community. As an example from the findings we can call upon personas like Mafu, who focussed on teaching his friends in his community what he learnt from his matric classes at his boarding school or we can refer to Darryl who said " Firstly, we need to create a platform where we can build up our children's

digital skills so they can succeed." Simphiwe, the e-Centre manager had reported " I have gained a good job through building up my digital skills and now I want to share my skills with my community to build up their skills." These examples of consistent intentions were witnessed throughout the research rounds, especially in the Zolani community. Participants had communicated that they saw that by obtaining digital skills, they could build up and support their community without having to leave to fulfil a job post elsewhere, they just were not given the right tools to investigate how to go about doing that.

The next observed intention, was co-creation. In the Zolani community, all the participants had reported that everyone knew each other and would often help one another with their everyday tasks. It is this community based intention that clearly reveals the nature of building networks to enable co-creation and working together to enable themselves and their community that is a widespread commitment of participants.

4.4.6 The Observed Reality: Designing Disclosure.

Designing disclosure relates to the process of embedding mechanisms that facilitate an on-going creative organising that addresses the uncertainty of experience. In this section, the focus is on building adaptive systems, which can become aware of the breakdown and adjust and transform the breakdown. In order to design such systems, style of the system must deconstructed, in order to show the future construction of the emergent style (Scharmer & Kaufer, 2013).

While carrying out the research, it was apparent to the researcher that members of both the Zolani and Paarl-East e-centres had not been exposed to seeing their own community members move through a successful transformation out of oppression. In other words, they did not experience their fellow community members succeeding and becoming a new version of themselves. As discussed earlier, learning happens through experiences shared with others. In this regard, these community members had not witnessed a mirror-like experience where they see themselves moving through their community's success out of oppression and self-doubt. These member's had not seen growth and upliftment, and were not aware of the ways in which they may be able to attain this. Members had not experienced success in an experiential phenomenological way.

Members have not been exposed to self-learning technologies and so do not have any context of the possibilities of enabling themselves to learn new skills and lead their community members into doing the same.

Participants have not been exposed to any successful proof of being assisted by the provincial or local government, in order to gain funding or find employment.

4.5. The Designed Future

In the designed future, the application of design science as applied phenomenology will be described in the processed utilized to create the prototype.

4.5.1 The Designed Future: Ontological Designing.

Similarly to the observed reality, this section will relate back to these prominent concepts outlined in the literature review. The designed future section, will articulate how the designer has acted upon these concepts and used them to design a prototype and disclose new ways of being.

From the findings stated in the *observed reality* section above, the current practices, equipment and identities, which construct the apparent worldhood, have been revealed. In this section, a new worldhood will be reconstructed and a designed prototype will be proposed.

Ontological designing refers to a circular like flow, where individuals design their world and their world acts back on them and designs them, (Winograd, Flores & Dreyfus, 1997; Fry, 2004 ; Willis, 2006). This relates back to Heidegger's understanding of the construction of worldhood; practices, equipment and identities. In order to ontologically deconstruct these concepts and articulate them for the purposes of the designed future prototype, personas were developed which reveal the identities, their practices and the equipment involved in these activities.

The research study had informed the development of the personas listed in Table 4. When based on user research, personas support a user-centred design approach throughout a project's lifecycle by making characteristics of key user segments more salient (Bedford, 2015). After the results themes emerged, it was possible to create personas based on participants' needs and demographical patterns. Table 4 provides six different personas (fictional characters) based on the user

research. Personas represents the major user groups, goals, needs and expectations; and explicitly do not cover every conceivable user (Grudin and Pruitt, 2002).

Table 4: Personas			
Persona	**Demographics**	**Goal**	**Needs**
Andiswa	**Age:** 26 **Occupation:** Unemployed **Location:** Zolani **e-skills:** Low **Language:** Xhosa	I want to become computer literate so that I can get a good job. I have a 3 year old son who I needs to support. I aim on gaining skills to support him and myself.	Needs to find information on: - Child support grant - Gain digital skills - Bursaries, - Careers, - Learning platforms
Darryl	**Age** : 38 **Occupation:** Social Worker **Location:** Paarl-East **e-skills:** Medium **Language:** Afrikaans	I want to create opportunities for my community and share my communities' skills. I want to help the youth in this community become skilled, so they don't have to struggle.	Needs to find information on: - Gain digital skills - Sharing information, - Job opportunities, - Learnerships
Joseph	**Age:** 60 **Occupation:** Businessman **e-skills:** very low **Location:** Zolani **Language:** Xhosa	I want my business to strive and grow so that my family and community can be financially stable. I am always looking for funding for my business and tips on how to make my business a success.	Needs to find information on: - Government tenders - Labour laws, - Business programmes, - SARS
Mafu	**Age:**18 **Occupation:**Matric Student **Location:** Zolani **e-skills:** high **Language:** Xhosa, Fluent english	I am aiming to study hard and get good marks for matric this year so I can become and engineer.	Needs to find information on: - Matric course material - Bursaries - Career advice, - How he can help his community
Mandy	**Age:** 21 **Occupation:** Studying marketing and business at tertiary level	I mainly come to the e-Centre to research for college assignments and print out notes to study at home. I also like helping out the children at	Needs to find information on: - Information for studies - Business administration information,

	Location: Paarl-east **e-skills:** medium **Language:** Afrikaans	the e-Centre.	- Marketing trends - Digital skills enhancement programmes
Rodney	**Age:** 32 **Occupation:** Security Officer **Location:** Paarl-east **e-skills:** high **Language:** Afrikaans	I want to follow my passion, which is sound engineering, I want to start a company producing music and sharing it. I have taught myself sound-engineering and would like to share my skills with young people.	Needs to find information on: - Funding - Business start-up information - Western Cape entrepreneurship
Simphiwe	**Age:** 28 **Occupation:** e-Centre manager **Location:** Zolani **e-skills:** high **Language:** Xhosa, very fluent English	I love seeing the people in my community learn more about what they can achieve with digital technologies, I want to make sure I support them as much as I can in gaining good e-skills.	Needs to find information on: - Online learning - Employment information for members - Western Cape learning opportunities.

Table 4 Provides a high level at the personas developed for this research.

Simphiwe

28 Years old
e-Centre Manager

This e-Centre is my life
I can see the benefit it brings

"I love helping the people in my community to learn about the benefits of technology."

About Simphiwe

Simphiwe is very passionate about technology, he wants to share the benefits with his friends and family. He loves teaching the people in his community and he can see the benefit the e-Centre brings. Simphiwe tries to help and teach as much as he can but he battles to get to everyone in time and answer all the questions they have. He wishes there was a better way for people at the e-Centre to find their way around.

Language

Mother-tongue : Xhosa
Secondary : English *(Very Fluent)*

e-Skills

Simphiwe is very tech-savvy he has a samsung S4 and is often found browsing the web, playing games and posting on Facebook and Instagram. He created a Facebook page for the Zolani e-Centre, where he posts jobs,bursary opportunities etc.

How often is he online?

He is online most of the time, when he isn't teaching or helping people.

- Simphiwe wants to be able to help people find jobs in his community.
- When he finds jobs or information that will help his community he posts it to a notice board in the e-Centre, he noticed that this has helped his community a lot.
- He needs to be able to find jobs, bursaries and internship options easily.
- He uses Facebook, Google, twitter, instagram and whatsapp.
- He is mainly influenced by his close friends and community members.
- He loves teaching at the e-Centre and is a very patient teacher, he is continually looking for ways to make his classes more exciting and easy to understand.
- Simphiwe spends a lot of his time browsing job sites and on Facebook, posting jobs and information on the e-Centre page.

Areas of interest

- Find relevant information
- My own space on the web
- Digital social interaction
- Learning courses
- Guidance on applications
- Help with creating a CV

Figure 6. One of seven personas developed for this research study. This is the persona of "Simphiwe"

Mandy

28 years old
Student

She has low e-skills. She is not sure what to do at this stage of her life.

"I would like to learn how to design websites, I don't know where to go to learn how to code or design."

About Mandy

Mandy is almost finished her degree in marketing and business management. She loves studying and finds that the e-Centre is a great places to come to get the information she needs and be be taught ways in which to look for the right information, so that she can do well in her degree.Mandy has an old blackberry and is starting to use it to browse the web when she is not at the e-Centre.

Language

Mother-tongue : Afrikaans
Secondary : English *(very fluent)*

e-Skills

Mandy learns quickly, once introduced to types of technology. She is gaining e-skills and sharing her skills with children.

How often is she online?

She is online, three times a week, at her local e-Centre, this is where she does most of her internet browsing. She only checks her email on her phone and is constantly chatting to her friends on instant messaging apps.

Areas of interest

- Find relevant information
- My own space on the web
- Digital social interaction
- Learning courses
- Guidance on applications
- Help with creating a CV

- Mandy needs to be able to go to find a job after she graduates.
- There needs to be an easy way for her to find jobs at her level, which can get her started on the right career path.
- Mandy wants to find out about internships and career advice in her area and what the requirements are.
- She needs to be able to search on Google and facebook to find events in her area.
- She spends a lot of time chatting to friends on instant messaging platforms finding. She is easily influenced by her friends recommendations because she trusts them.
- She has not received much career advice before. She needs clarity about where to find more information.
- Mandy often browses for career advice, but doesn't find anything. She often looks for job opportunities on the WCG website for insights into what she needs to learn to embark on the career path she dreams of.

Figure 7. One of seven personas developed for this research study. This is the persona of "Mandy"

The personas described above had informed the design of the prototype in the following way:

- Personas enforce a user-centred design (UCD) process throughout the project. The fundamental idea of experience design centres on the idea that a design must focus on people, rather than teaching people how to use a product: UCD, not technology-centred design. Personas based on user research assists in the understanding of people, their behaviours, attitudes, needs and goals (Bedford, 2015).
- Having a visual understanding of the audience of a product can generate empathy for the real people who will be using the products. This creates an understanding of what the identities view as meaningful and this meaning becomes shared meaning between the designer and the users. It creates a deeper understanding as to *why* a user may perform a certain task or what the higher level need may be for the task performed.

- The personas method allows for business value to align with user value. McMullin (2003) describes this concept as value-centred design. This value comes from the intersection of business goals and context with individual goals and context. In this way, a persona's goal or motivation can create new business value that might have been unknown to stakeholders.

- The act of creating personas makes the findings and observations explicit about the target audiences. By creating personas that have a story behind them, with a visual reference point that makes up their character, the project team was able to associate with and comprehend the users' motivations, goals and tasks on a much deeper level.

Personas utilise the mind's powerful ability to extrapolate from partial knowledge of people to create coherent wholes and project them into new settings and situations (Grudin and Pruitt, 2002). They encourage an end-to-end approach when considering large sets of features. The developed personas were utilised as a key technique in creating a mirrored understanding of the identities involved in the practices and construction of this world. They had formed a platform from which these identities could themselves intervene and partake in their own ontological design process.

When systems experience turbulence, Scharmer C.O., (2009) claims that a different type of leadership, that doesn't necessarily trickle from "the top", but rather comes from all levels is what makes a significant innovative leap into an emergent future. This leadership arises from people and groups who are capable of letting go of established ideas, practices, and even identities. Most of all, this leadership comes as people start to connect deeply with who they really are and their part in both creating what is and realizing a future that embodies what they care most deeply about (Scharmer C. O., 2009). In order to create this deep connection, the involved identities must be deconstructed in order to design a future that encapsulates their deep meaning.

Winograd, Flores & Dreyfus, (1997) refer to ontological designing, as doing more than just asking, what can be built? It is about engaging in a philosophical discourse about the self, about what can be done and what these identities can become. Tools are fundamental to action, and through these actions the world is generated. Winograd, Flores & Dreyfus, (1997) insist that the transformation that ontological designers must be concerned with is not a technical one, but a continuing evolution of how they understand their surroundings and themselves or how they continue becoming the beings they are.

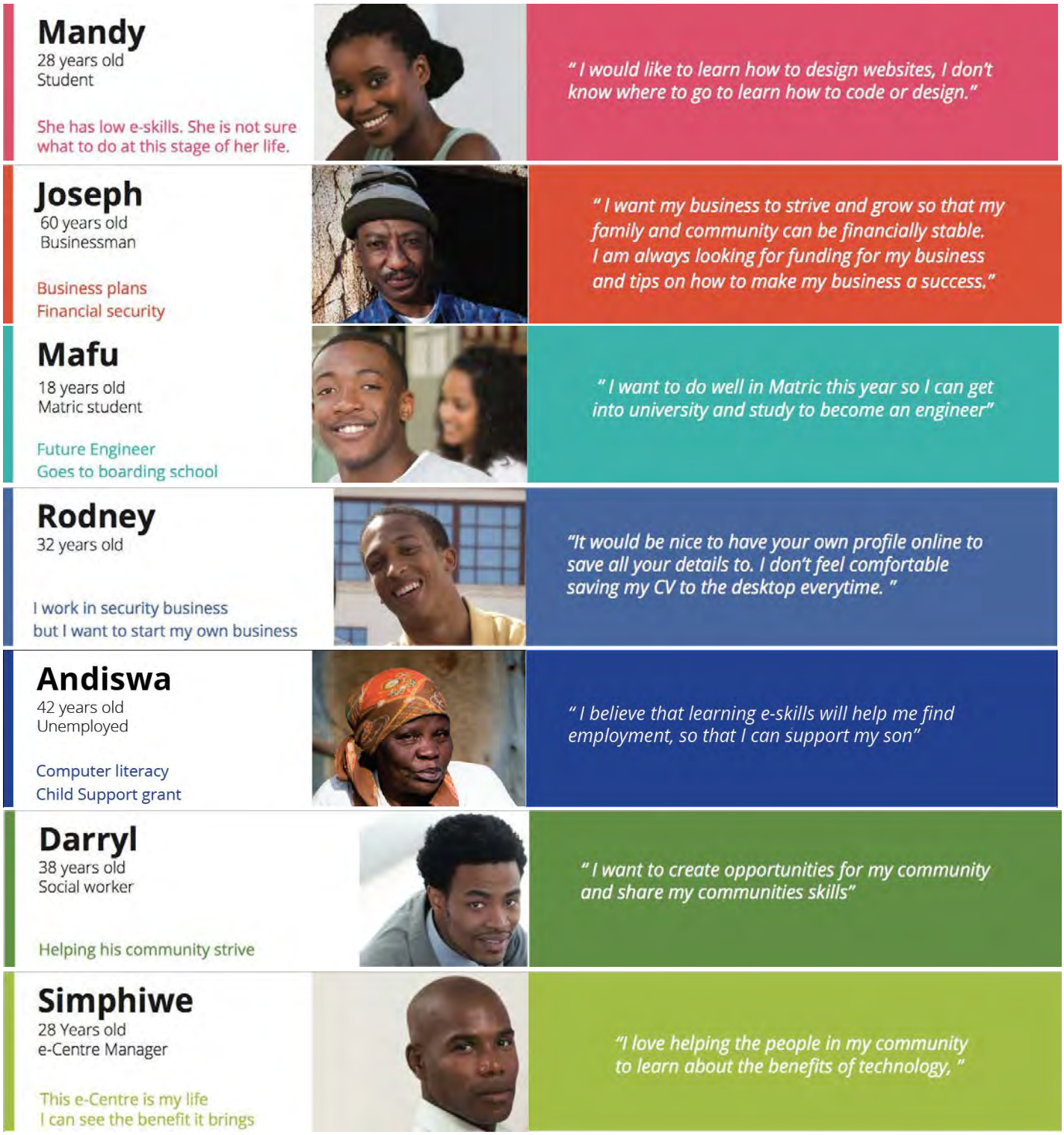
4.5.2 The Designed Future: Blindness, thrown-ness, present-to-hand and Ready-to-hand, and Breakdown

Blindness and Thrown-ness.

In the design process, the designer must recognize what the user's goals are in order to design useful and meaningful interactions, for the user of the system. Comparing this to Heidegger's, (2008) understanding of thrown-ness, is a way in which the designer needs to understand what users are being thrown towards. In the designer's understanding, users are being-toward an end goal, the designer observes the users being toward a certain goal. They are thrown towards achieving this goal. These user goals were the basis from which personas were created. It was the personas, goals that they were being-towards that had enabled the articulation of their persona types. Figure 8 shows a high-level view of the user goals, which were observed during the research phase. These goals were communicated into a full-

colour highlight block on the personas, to denote the thrown-ness and habitual tendency of these personas.

Figure 8. The user goals of all seven personas described in the blocks of colour



The portrayed user goals above display that users are interacting with a service, not merely for the sake of simply interacting with it, but rather in order to accomplish very specific tasks, which are a part of larger activities and practices. Therefore, deconstructing the user's motivations, needs and motivations are tantamount to the implications of design, everything that designers, design, should have the end user's future goals in mind.

This crucial understanding that designers must have on the users involved in the system, relates to Heidegger's notion of thrown-ness in that he claims that individuals are constantly taking action towards a future goal, and that goal drives *Being*. For example, an individual will eat in order gain energy and survive; they may seek friendship in order to feel connected to others etc. Heidegger questions the concept of "now", asserting that all current focus is directed toward the future (Heidegger, 2008; Dreyfus, 1990).

Being and Time characterizes Dasein as being "thrown." Heidegger states that Dasein is dropped into the world with which it must cope. Most of the time individuals are thrown into situations that are never ideal, and they are forced to cope with them, similar to coping or dealing with broken things in order to utilize it on an everyday basis. Wendt, (2015) states that this type of incorporation necessitates design, in that it is used to liberate us from the arbitrariness of life (Oosterling, 2009).

Wendt, (2015) relates the idea of Dasein to design and claims that this view of temporality of Dasein can be translated directly into the design process through research methods and ideation which act as a means in which to understand the past, present and from that to anticipate the future through the perceived goal-orientation of Dasein. Designers must use induction and deduction to comprehend the present state of a user's world in order to gain an insight and abductively create alternative futures (Martin R. , 2009; Peirce & Houser, 1998)

The user goals mentioned above had shed light on the user's thrown-ness. These user goals presented through the identities of the personas thrown-ness can be articulated as follows:

1) Self-learning, enabling the ability to teach myself skills and others
2) Growing my business in order to create employment in my community, so that my community can grow and sustain itself.

3) Investing in myself with a good education will enable me to live a good life and construct a decent life for myself.
4) I have taught myself digital skills and I am experiencing the benefits of it, I want to share this with my community, so that together, we can build more skills.
5) I would like to reflect on what I have learnt or what I have applied for so that I have a history or record of what I have applied for or learnt.
6) I have children to feed and a family to look after, I need to look after their welfare in this world.

These user goals, allow the designer to begin to understand the orientation of the user, and how they may come across the service or product during their thrown-ness towards achieving these goals.

Ready-to-hand and Present-to-hand

The smooth coping experience is marked by deep involvement the user in ready-to-hand mode is in a state of action without conscious thought. In order to maintain this "flow" or this deep involvement from the user, experience designers need to carefully construct information, in order for the right information to be present-to-hand when the user calls upon it. Information architecture, or the construction of information in a system, is the careful act of making the information easy to find for the specific personas. In other words, what is the logical layout of information, so that the users can maintain their involvement with the object?

Figure 9 explains the information architecture of the Cape Online system. It shows how information is grouped and nested within larger conceptual sections, so that users may find this information easily.

Another way, in which *ready-to-hand* and *present-to-hand* have shown them to us, has been through participant's digital skills levels. I found that participants with very good digital skills were very engaged in the objects they were using; they had reached the comfortable stage where the mouse, keyboard and screen had become a part of their world. Similarly, participants, at different skilled levels were in the process of becoming comfortable or coping with these new objects they had come into contact with.

The concept of user-centered design refers to treating users as individuals, and creating people-centric systems, rather than technology-centered systems. This means it must envelope the messiness of being human along with the ability to cope, find meaning, and adapt to challenges (Wendt, 2015). The information architecture structure was put together based on the thrown-ness underlined above. User research, personas development and the articulation of thrown-ness, had revealed what users may find as a logical or meaningful manner in which to group and lay out information. The information architecture map shows the different levels of navigation through the grouped information in the proposed system. These groupings were made based on common practices of users and feedback from the research. The thrown-ness and breakdowns of the observed reality had constructed a new pattern or flow in which to organise information so that it may appear more ready-to-hand for the users at the relevant time.

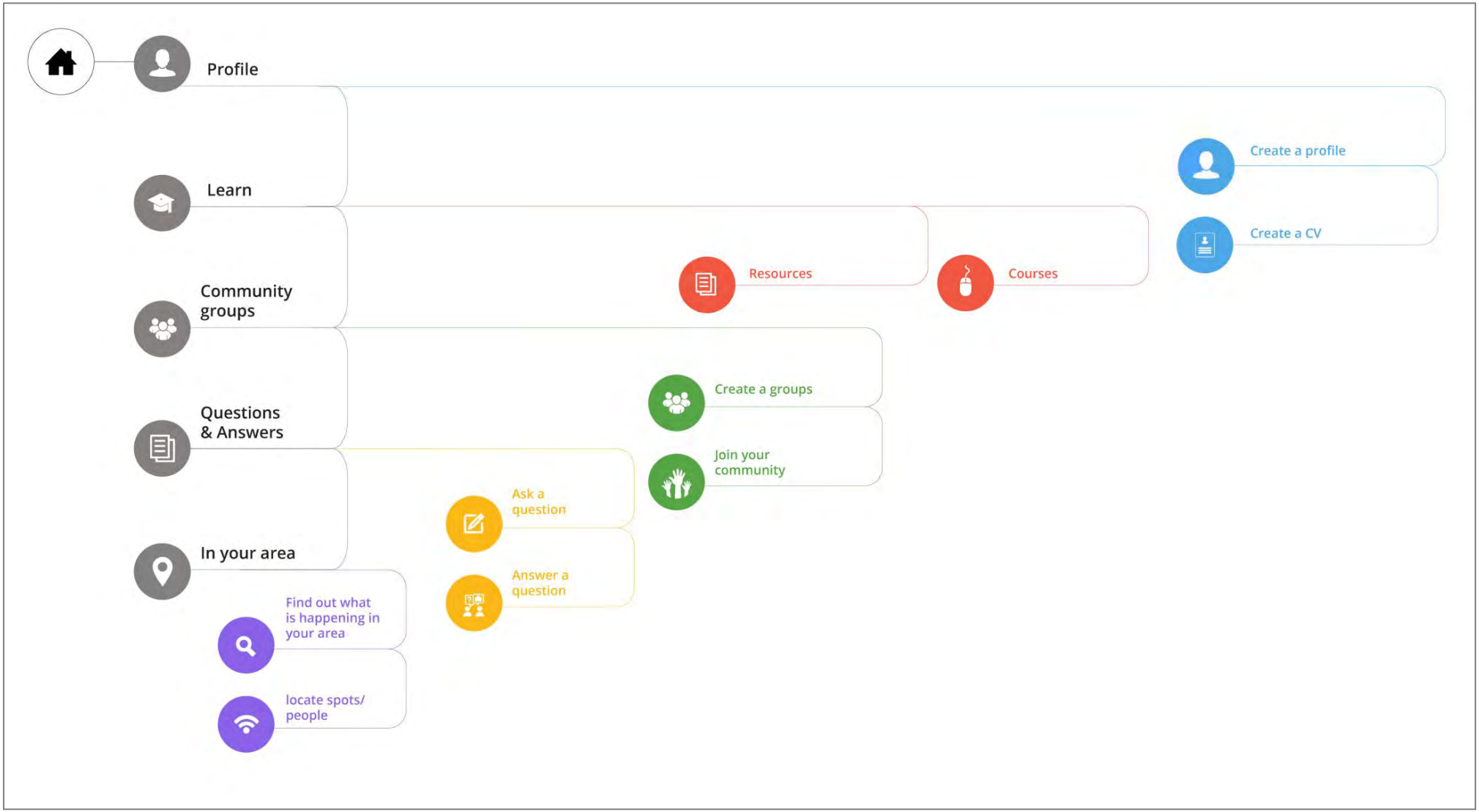


Figure 9. A diagram showing the information architecture produced during this research study.

4.5.3 The Designed Future: Commitment

An essential part of being human is the ability to enter into commitments and to be responsible for the courses of action that they anticipate. Winograd and Flores, (1997) argue that the essence of language as a human activity lies not in the ability to reflect the world, but rather in its characteristic of creating commitment. For example, when a person understands something, it is implied that they have entered into the commitment implied by that understanding. Winograd and Flores, (1997) regarded technology and software to be a medium through which commitments are being conveyed between developer or designer and user.

In order to carefully facilitate a meaningful engagement between the user and the interactive system, the points of engagement between user and the service must be understood, and the intentionality behind the future-forming path. It is for this reason that user-journey maps or experience maps were used to visually articulate these pathways of meaning: to grasp the entirety of all the personas meaningful actions and where they share meaning or differ in comprehension of meaning.

The experience map below, articulates the sequential flow of the personas, being thrown towards their user goal and what types of breakdowns may be revealed and at which points they need to be adjusted to better flow for the users.

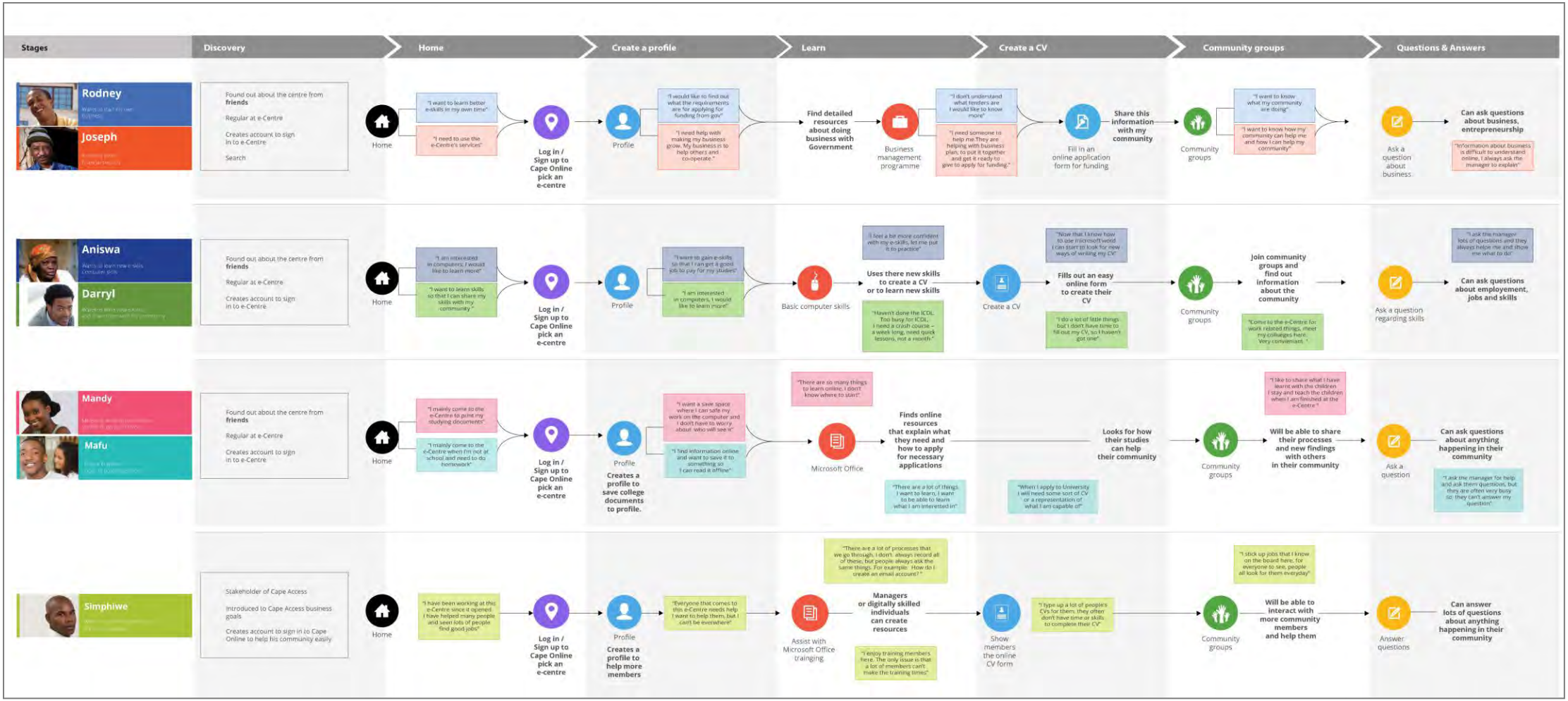


Figure 10. A diagram showing the final version of the user journey map produced during this research study

4.5.4 The Designed Future: Breakdown and Innovation of Sense

This section reveals how the theme breakdown and innovation of sense had been articulated through a practical component and designed into the future prototype. In designing systems and the worlds that they disclose, designers must anticipate the range of occurrences, which happen outside the normal functioning, that provide both to understand them and to act on them. According to Winograd & Flores (1987) this is the basis for heuristic methodology. They explain further that the analysis of a human context of activity begins with an analysis of the domains of breakdown, and that can in turn be used to generate the objects, properties, and actions that make up the domain or, in this case, the prototype. In this regard, the researcher went through the process of testing the prototype with the seven persona characters that were developed for this research study. User testing is a perfect method in which to illustrate the ways in which these users may experience breakdowns when using the system.

During the user testing rounds with participants, many breakdowns were revealed. Table 5 shows all the breakdowns according to the interface elements, the table is broken down into two columns, one that shows the breakdown that was experienced and the second shows the adjustment of the breakdown. This iterative method was based on the understanding that every attempt to anticipate breakdown reflects a particular domain of anticipation. Which reveals that designers need to design with flexibility in order to encounter other (always anticipated) breakdowns (Winograd & Flores, 1987).

Table 5: Breakdowns revealed during user testing and how they were adjusted while testing.		
User interface element	**The moment of breakdown or feedback of potential breakdown for the user.**	**Adjustment of the breakdown, which the designer makes.**
Profile	1. "The activity area of the profile is a bit confusing. "	1. Add in a description explaining what the activity area is communicating.
CV	1. "What if I want to send different CV versions to different people? For example, if I apply for different jobs which require different skills." 2. "I don't have any previous work that I have done, so I can't fill in previous work experience sections." 3. "I haven't completed matric, so this doesn't apply to me." 4. "The writing on this form is difficult to read, I can't see it, it's too light." 5. "I would like to add more information about myself, but there isn't a spare text field." 6. "The form is asking me what my matric pass rate is again, but it's under the degree/diploma question." 7. Some participants didn't understand the input fields clearly, for example, the instructions of the first input field said	1. This would require a lot of work, potentially there could be a lot more points of breakdown which appear if there are multiple CV formats to choose from. 2. Make the work experience section in the CV optional or have another option for users to fill instead. 3. Add in a special CV for school children. 4. Adjust the font and make it a darker colour. 5. Add in a spare free text field, where users can add in any information they need. 6. This is a bug in the system that is not meant to be there. Remove bug. 7. Add in clear, easy to understand descriptions that are short and quick to read, yet explain what the user need to add in.

	description. These participants found it unclear as to how they should describe themselves.	
Community groups	1. Two participants didn't really know what community groups meant	2. Add in more of a description showing what community groups are about
Resources	1. "I don't know what is meant by resources, so I'm not sure whether I would click on it, to find information on email, social networks, etc." 2. Some participants tried clicking on the icon but nothing would happen. (There was no affordance to show where to click)	1. The designer would need to rename the section resources so that it better describes what can be found there. 2. Make the icon clickable and give the resource more affordance, so that users know they should click on it.
Courses	1. "A session at Cape Access centres are normally 45minutes, will there be enough time to complete a course?"	1. Courses need to be adjusted to fit the time frames of the users. Most users come to the e-centres to do some emailing, or other admin tasks beforehand, so course lessons will probably have to be around 30 - 20 minutes. 2. Courses also need to remember where users were beforehand, so that they can log in and pick up from where they were.
In your area	1. Most participants did not understand what they needed to do when it came to this section. Some participants had said they didn't see the point of seeing this information.	1. This should maybe be revealed to the user as the information appears. It should automatically show the users area and communicate what is happening in their area at the time they call upon this information.

Table 5 describes the relevant breakdowns experienced during the usability testing

Participants, who were tested, had diverse sets of digital skills. They ranged from having good digital skills, which is, they could easily use a computer, type up documentation no word to participants who had low digital skills, and battled to use a mouse and found it difficult to type on a keyboard. The participants used for testing purposes were chosen from the target groups used to make the personas, in other words, each persona representation was tested, as user-centered design techniques suggest.

Heidegger, (2008) states that when equipment malfunctions there is a discovery of the incompatibility of the product or service by 'circumspection of the dealings in which we use it,' and the equipment then becomes 'conspicuous.' Heidegger claims that the 'conspicuousness presents the available equipment in a certain unassailableness.' This creates a moment of being surprised, and in order to cope with it, there must be a shift into a new way of coping and continue (Heidegger, 2008; Dreyfus 1990). After each test was completed, the designer went through a rapid prototyping phase, where they would fix the revealed breakdowns, or adjust the revealed breakdowns for the next test. The designer acted upon those elements or breakdowns, which were not anticipated, if the designer was not able to fix the element, they would take a note of the breakdown and examine what that meant for the entire system of interactions.

According to Winograd & Flores, (1987), the designer is continually engaged in a conversation for possibilities. Attention to the possibilities being transformed must be in a constant interplay with expectations for new possibilities being created. Designers can do this by being aware of breakdowns and blindness.

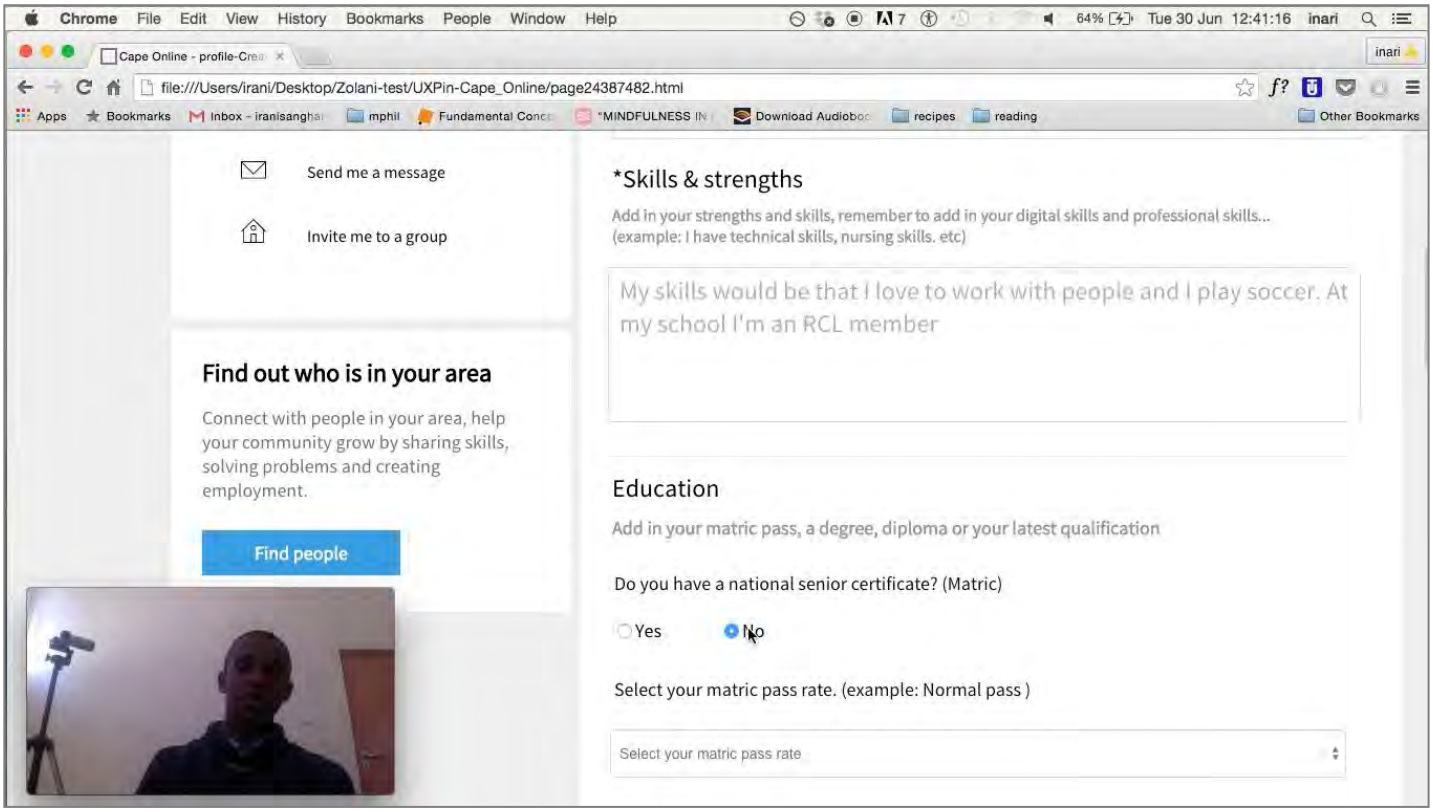


Figure 11. Screen shots taken from the user tests undergone in Zolani e-Centre

4.5.5 The Designed future: Style and Frame

This section will uncover what the proposed style is of the designed prototype. This style will be communicated through the tangible example of the created visual language and identity that had been formulated.

As mentioned in the previous section, the observed reality, the observed style was similar to the style of Ubuntu, which is community-based wellness through oneself. However, there was no medium for participants to act upon this style from. The new style is meant to instil this inherent understanding in order to partake in meaningful interactions in their disclosed world.

This new style is articulated through the visual language and brand identity of this designed system, where the focus has been on maintaining the observed style. figure 12 shows the landing page, which shows a sign-up form that the user has to fill in when they arrive at the Cape Access centres to use the equipment. This page shows how the language used in the message is easy to understand and clearly communicates what types of practices users can engage with when they use this system.

Figure 12. Log in screen to the Cape Online prototype

In order to unearth the proposed style, an investigation into what types of practices users may engage with on this system is needed. There are numerous practices, which were taken from the research findings and communicated into flows of experience that users can move through. These experiential flows can be described as initiating practices such as:

- Self-learning
- Learning through doing
- Sharing resources and inquiry
- Helping other community members reach their goals

- Reflection on self
- Collaborative spaces for sharing learning and processes

The above-mentioned practices have been organised carefully, by using information architecture methods, to facilitate these experiences and make them present-to-hand and ready-to-hand for the users when necessary. Through these practices, users can relate their goals to these designed pathways in order to easily and collaboratively help one another to achieve their goals of the current practices.

The manner in which they are designed, and visually communicated is the new proposed style. The style is based on visual principles, which make sure the information is presented clearly and is easy to understand for those using the system. Figure 13 shows the questions section, this particular page shows the question categories which users can navigate or search through to choose the relevant question they are looking for.

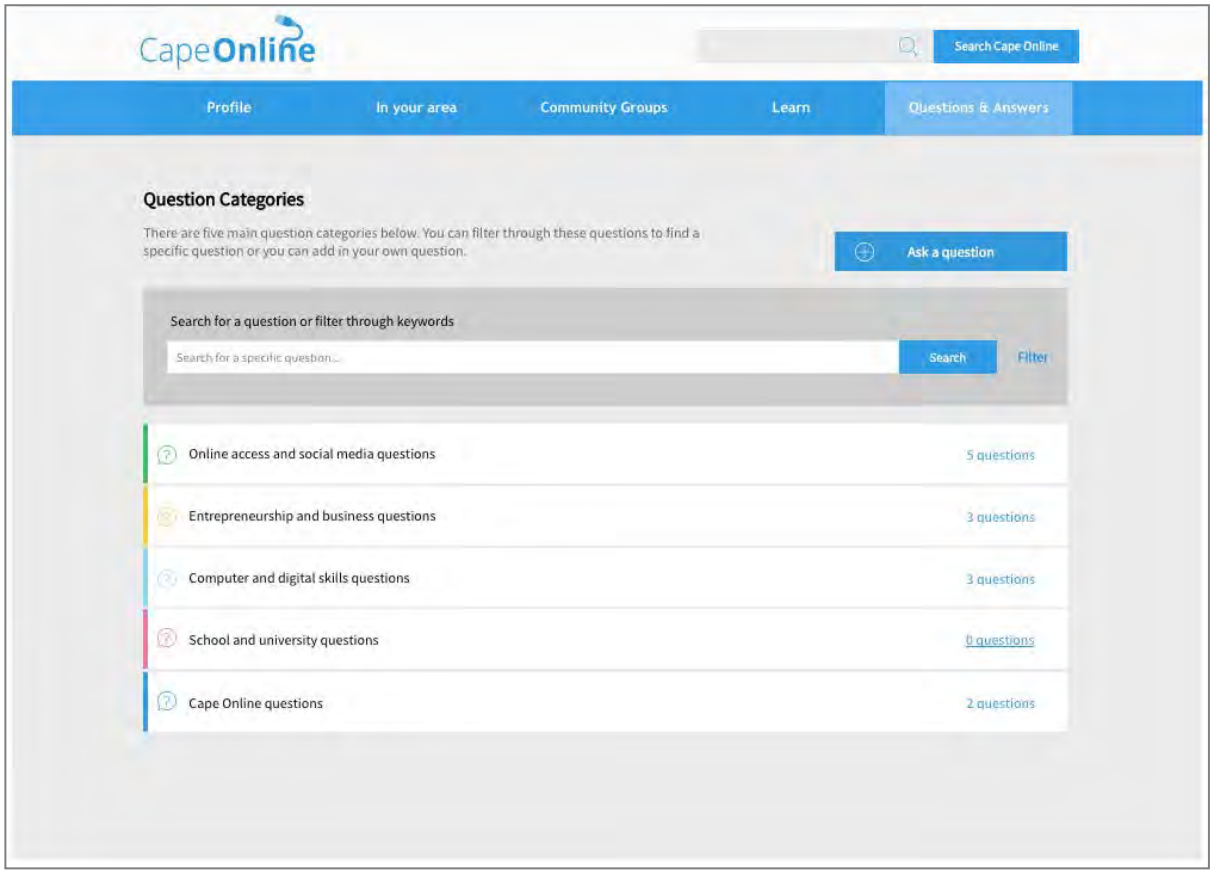


Figure 13. Questions and Answers screen of the Cape Online prototype

4.5.6 The Designed Future: The Role of the Discloser

This theme will refer to the creative thinking processes utilized and instilled into the creation of the prototype. To describe these processes, one must begin to engage with one's shared history, the background of meaning of the everyday in order to engage in the transformation thereof. Spinosa, Flores and Dreyfus, (1997) refer to the three ways in which disclosing may be historical, that is, it may produce changes in the coordination of practices, this research lens will describe the notion of being sensitive to the disclosing that on is carrying on in one's life, which Spinosa, Flores and Dreyfus, (1997) refer to as *disclosing that one is a discloser*.

The focus here was based in the fundamental question of, how does the designer design practices for these personas, so that they can engage in their everyday practices, in order to interpret their world, and in turn make their world and practices more meaningful for themselves and for their community.

As disclosers, the use of design must be used to interpret, act within and create the world. As mentioned earlier, Anne Marie Willis states, " we design our world and our world acts back on us and designs us." How do designers of systems, facilitate this process and maintain their meaningful acts. In the example of Cape Online, what needed to be designed in the system was a continuation of the style designed. The style that was designed was based on the concept of *Ubuntu*, there needed to be a system built for participation and connection because that is what was deemed meaningful in the community. This section will talk about, the researcher's role as a discloser, and how that was communicated through the prototype, more specifically communicated in the user-interface elements and visual language created throughout the system.

There are two distinct areas of focus from the *discloser's* point of view that this research study has attempted to initiate the creative potential of thinking and engaging with shared history. These areas will be described through the specific artefacts that have been designed in this research study.

The role of the discloser refers to the creative potential of human being's thinking; As one creates the world they inhabit it by acting out their thinking and articulating it into something tangible. During the user-testing phase of this research phase, there were a few occasions where users expressed design as self-articulation. One of the examples was when a user who may be described as "Andiswa" from the

personas, was filling in the online CV form, and expressed that she found that these steps had made her see her look at herself in a different light. She explained that by filling in this form and being asked questions, where she reported to "think about myself in a more positive way" it had made her feel like she could get a job. She expressed that, by filling this in, she felt like she had skills that would definitely get her a job and it seemed possible, whereas when she types up her CV in word, she feels like she has nothing to type up and nothing to say about herself, because she doesn't know what to describe.

This is a perfect example of how the designer has inculcated practices, which create new ways of being, or new ways of understanding self. In this respect, experience design has worked as a medium from which to discover ways of being and to become more self-aware. In order to design for transformation, there needs to be an understanding of what the practices is that are being designed. These new practices, which have been designed into the prototype, are collaborative digital spaces, initiating leadership and inspiring self-learning. These three practices can be experienced in the prototype: Cape Online, through the following user interface elements:

- ***Community groups:*** An elderly businessman from the Zolani e-Centre proclaimed " I want my community to do well, I don't want the youth to have to leave their home and families in order to be successful, they must be able to learn skills and bring them back to the community, to grow our skills together."

  The manner in which collaborative digital spaces were created with the prototype were through the interfaces elements of the community groups, this is where members can connect with each other through communal interests. By joining, a group member can also learn from other members in their community or even beyond their community. Any member can start a group and organise events, lead online learning processes or share their learnt knowledge on a subject.
- ***Questions and Answers:*** One of the female participants at Zolani e-Centre had reported that "What I learn when I come to the centre depends on if the manager isn't too busy to help me answer my questions" This interface section of the prototype particularly promotes inquiry and self-learning through asking

questions and articulating past learning to create inventory of everyday learning.

- ***Profile:*** One of the male participants from Paarl-East e-Centre had asked " It would be perfect if I could have my own profile, where I can log onto the computers and store all my information I have created, because I don't like storing it on these computers where everyone can see them."

The profile section is central to Cape Online's experience. In order to navigate through the system, the user must have a profile. In the profile section, the user can create a representation of themselves and orientate through the system to learn new skills and find specific information. The major practice of the profile section is the creation of a CV, this process is facilitated through an online form, which is constructed for the user to easily create a CV that best represents themselves.

- ***Resources and courses:*** This section is the core element that focuses on creating platforms for members to learn and share their knowledge with others. Here, users can view resources and view courses on the relevant subject matter.

In order to describe the creative thinking processes that were apparent in the designer while creating the designed future prototype, reference to Gibson, J. (2014) theory of affordances must be made. Here, he critiques dualism similar to Heidegger and Merleau-Ponty. According to Wendt, (2015) Gibson saw affordances as evidence against the hard line drawn between self and world:

> "When in use, a tool is a sort of extension of the hand, almost an attachment to it or part of the user's own body, and thus no longer a part of the environment of the user. But when not in use the tool is simply a detached object of the environment, graspable and portable, to be sure, but nevertheless external to the observer." (Gibson, 2014)

Gibson's, (2014) theory of affordance, in this case, is similar to Heidegger's notion of readiness-to-hand. However, Gibson, (2014) takes this a step further by coupling the object and subject as an extension of the body. Wendt, (2015), refers to this as embodied action or skilful manipulation, which couples body and world into a

system of interaction. In the creation of the designed future, for this research study, the designer is coupled with the mouse when creating the prototype in Photoshop or UXpin. At moments of deep involvement the designer had entered into a coupling with Photoshop or UXpin, the programme itself, manipulating the interface without conscious thought and working toward the end goal of a final design. The designer works at transforming their thinking into an interaction, by utilizing technology as a tool to articulate their thinking while, in this process, the mouse is literally an extension of their hand or selves.

In the creation of the prototype, engagement in a shared history of the users, through their practices shed light on the newly designed practices which align with their style was the predominant focus of the designer. This influenced the user interface elements, which were designed for specific affordance. Affordance, in this case, regards to the user interface elements which were used, in the Cape Online system. These elements were designed to specifically align with user's shared history, in order to extend their way of being through a common language, which they could use as a reference point, from which to experience future ways of being.

According to Tonkinwise, (2008) "an affordance is an actual possibility, a promised action opportunity." In other words, this refers to affordances as results of interactional perceptions, where the user sees not just a feature, but a future way of making use of that feature. Tokinwise, (2008) proposes that affordances are a kind of forced abductive thinking: the perceiver must interpret possibilities for action and thus consciously shape a future state.

> "I do not see a shape, but a handle, or rather a 'handlable'; I see myself handling that shape; or more precisely, my hand sees that handlable, reaching out for it before I have even really 'seen' it (as if I were something other than my hand)." (Tonkinwise, 2008)

Tonkinwise, (2008), explains that a user perceives an affordance immediately as *what could be* and what the affordance of this element *can do* as opposed to how it exists now. In this regard, a user interface is made up of future-making elements which are collected together to stimulate shared future-making through designed affordances. With the creation of the Cape Online system, there needed to be interface elements which were laid down, which users could relate to. From this reference

point, the system can use carefully constructed affordances to act as future-making realities. The manner in which this was undertaken was, through utilizing a similar visual language that was known to the users online interactions, in this case, it was Facebook. Most research participants had reported that they used Facebook mostly, the first task they would perform would be logging into Facebook, one participant reported "I arrive at the centre and open Facebook, I only use Facebook to look for information, talk to my friends, find out about what is happening in my area and read articles I find on Facebook."

For these reasons, the design of the Cape Online system simulated Facebook's user interface interactive elements and personalised them to suit the users needs in order to create an initial platform, where the user could easily orientate themselves through. Figures, 14, 15 and 16 display the user interface elements from the prototype.

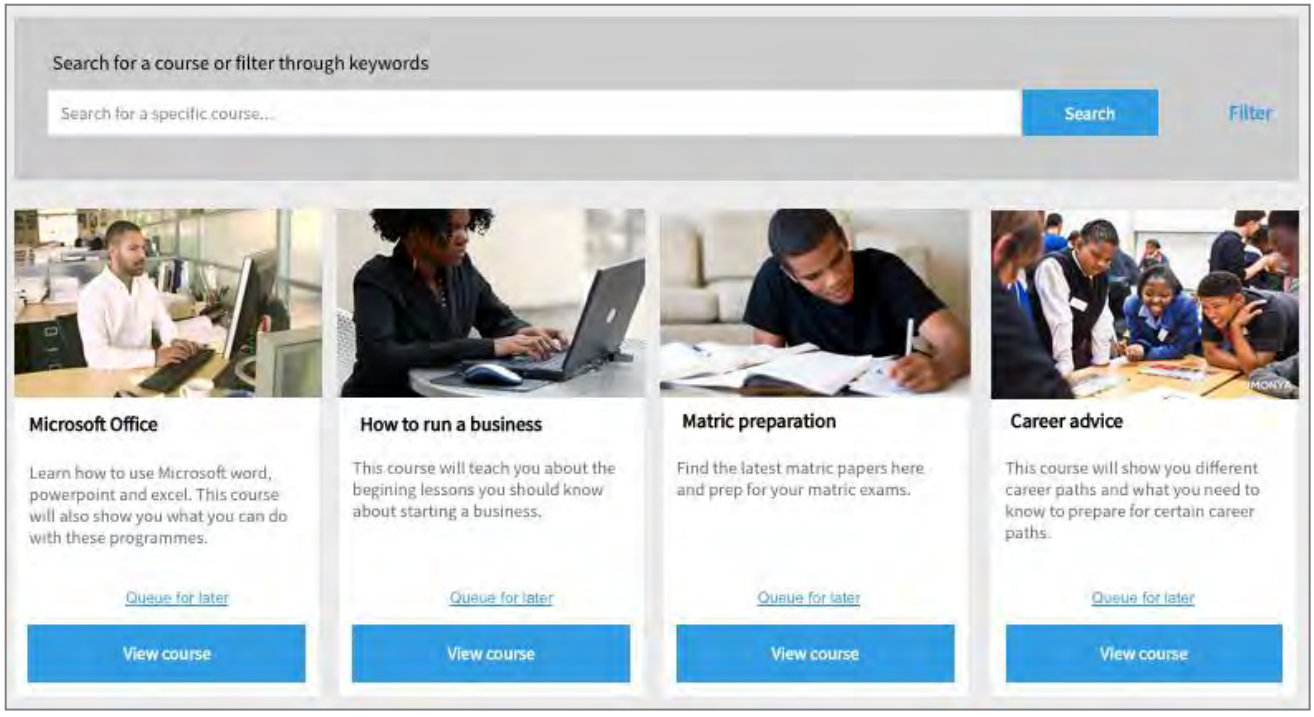


Figure 14. The courses screen on the Cape Online prototype

Figure 15. The search and filter element on the Cape Online prototype

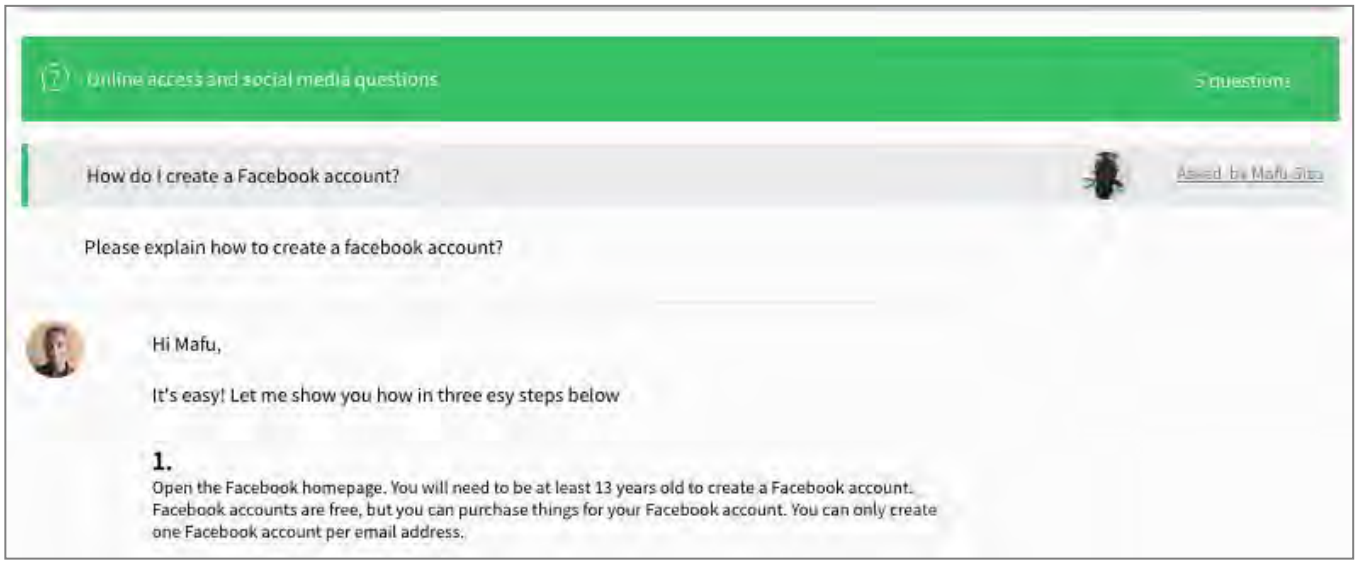


Figure 16. Asking a question user interface element on the Cape Online prototype

The role of the discloser then is to transcribe *what things are* to *what things could possibly be*. This requires a look at how embodiment and affordances contribute to creating meaning. The notion of "embodied meaning" refers to meaning that " arises from the ways in which there is engagement with the world and how to act within the world (Dourish & Bell, 2011). "

4.5.7 The Designed Future: Designing Disclosure

This theme will take the process of ontological designing a step further and explain the act of designing disclosure. This section will describe how the designer, works as a discloser to design adaptive systems which can 'become aware' of when breakdown may occur and create relevant mechanisms in which to facilitate a creative

manner in which to transform the uncertainty of experience. Ultimately, designing disclosure refers to embedding the practices, which create resilience and self-organisation within the system design. This section will describe the four phases of disclosure acted upon in designing disclosure of the intervention of the designed future.

Firstly the designer investigates what is centrally concerned with the *self*, *purpose* and *identities* in the situation of concern. This requires a deep understanding of the context from which the user is experiencing the object or service. Through this process, the designer begins to notice a world of meaning. This refers to the disclosure on oneself in the world; it is within this space that the designer is present to the field of possibilities from their basic stance. To translate this, within the research situation the designer had recognized issues the community were facing as issues they had shared such as: where to find information and obtain a good pass for matric, what to do after school, what career path to pursue, how to learn digital skills and apply them, battling to find the right job, unemployment and creating a curriculum vitae that would lead to a job. For the designer, this shared understanding before them had led to a meaningful comprehension of the context, from which the designer would design from.

This leads to the next phase of disclosure, which relates to what the intervener or designer notices as meaningful to themselves and the system of intervention. It is at this phase that salient points of significance begin to emerge and reveal potential disclosure of *what could be.* At this point, the designer begins to recognise that there is a need to design practices which assist members with finding the necessary information for pursuing their career path, or creating a successful curriculum vitae in order to find employment and other goals. These practices then need to be made accessible on a digital platform, available at all e-Centres around the Western Cape province.

This initiates the designer to move through the next phase of disclosure and begin to assemble the building blocks to formulate an articulation of this emerging reality. In this research, the designer began to wireframe possible interface designs, create Photoshop designs and ultimately create an interactive prototype, which encapsulates the theories and practices of the service model. The designer shares their findings with the world or particular users, which creates a shared commitment and understanding. The designer does this through testing the system with actual users

and reconstructs shared meaning within a group of users, an example is found with the user testing rounds completed at the Zolani e-Centre with the persona profiles created for this research study. This is the third phase of disclosure.

Now the designer has entered the phase of dialogue between the context of the intervention, the intervention itself and the designer. This refers to the iterative designing and adjusting that takes place between the designer, the feedback from the users and the actual working of the design itself. This accumulation is directed by experiential understanding within the structured space of possibilities. With time the designed future establishes consistency, becomes structured and has greater clarity. With this, a new sense is introduced and with it a new *practice*.

In this manner, the designs created are not simply descriptive but are rather enacting new realities, new theories and new concepts. The goal of the designer here is to create new realities, which are usable, understandable and relatable in order to begin meaningful conversations, which instil new ways of dealing with the world. The fundamental work of the designer is in facilitating the emergence of new realities from empirical understanding, which are grounded in experiences. In the unconcealment of these realities, with it new worlds that are found are based on new truths that in time become *the* truth.

4.6 Consolidation

According to Wendt, (2015), there is a natural organization of meaning in ecosystems, but with experience design this process is made explicit. It takes on the embodied practice of organizing everyday life and abstracts it just enough to make it conscious.

Phenomenology is interested in the nature of the world, but always through the lens of the individual and their capacity to generate meaning. That interpretation, the finding place, understanding the connection between self and world – is experience. Designed objects can either help individuals understand the complex web of meaning in which they exist, or they can obscure it, or both (Wendt, 2015).

Understanding systems of things and how humans experience them is the domain of experience design. The complexity of this statement lies in the idea that experience design deals with both the tangible and intangible. It is the design of experience, which implies that designers must also design the things that are experienced. Experience design always has an object; it is the experience designer

who crafts the experience of products and services by ensuring an understanding of things and meaning systems. The designer is concerned with both systems and things. The focus is on attempting to create the conditions of possibility for intended results and to construct clear affordances, which play with the movement from embodiment to external (Wendt, 2015).

Chapter 5: Artefacts

This Chapter provides a high-level description of all the artefacts that were produced in this study. Each artefact is explained. Full versions of all the artefacts can be found online from http://inqubo.iranisangham.com/

5.1 Personas

Seven personas were developed from participant observation and participant interviews. These personas do not represent the users' real names and real faces and are not based on only one participant per persona; they are based on similar patterns found across the research findings. Although the researcher had been granted clearance to use the photos of the participants interviewed during this research, the researcher decided to rather use stock photos to represent the participants for their protection. The personas are all communicated in the same layout, which describes the personas:

1) Personal details, such as their names, age and what they are currently doing.
2) A photo, which shows what this persona archetype may look like.
3) The personas current goal or need. This is represented in the block of colour next to their photo. This may change over time, depending on what stage of their life user may be at.
4) Below the "user goal" block is an area, which lays out common practices this persona might engage in on an everyday basis.
5) On the left of the common practices block, are descriptive paragraphs, which explain information about the persona, their language, their e-skills level and how often they are online.
6) The section at the bottom of the page is a visual representation, which communicates the personas areas of interest.

Figure 17, shows one of seven personas that were developed for this study. These personas represent most of the types of participants that were interviewed in this study. These participants roles can be described as: a matric student, a college student, an unemployed member, a senior citizen, a potential entrepreneur, a local employed

worker and e-Centre manager. These personas can be found online at : http://inqubo.iranisangham.com/personas/

Mafu

18 years old
Matric student

Future Engineer
Goes to boarding school

" I want to do well in Matric this year so I can get into university and study to become an engineer"

About Mafu

Mafu is at the Robertson Boarding school. He believes that if he works hard he can be sucessful, he always visits the library and spends his spare time looking up information that will help him understand his matric subjects better. He enjoys participating in sport at his school and he hopes to get a scholarship at a university in the Western Cape. He has a Nokia Lumia smartphone and uses it to listen to music, chat to his friends and browse the web.

Language

Mother-tongue: Xhosa
Secondary: English and Afrikaans

e-Skills

Mafu is very tech-savvy, he is often found on his phone, playing games or browsing the web.

How often is he online?

He is online throughout the day on his phone, when he is at school he is online, and when he goes home to visit family he spends a lot of time with his friends at the e-Centre.

Areas of interest

- Find relevant information
- Digital social interaction
- Guidance on applications
- My own space on the web
- Learning courses
- Help with creating a CV

- Mafu looks up all his information for school online.
- He has been looking at university options, he wants to get a good degree, at a good university.
- Mafu wants to find out about the process of appplying for a bursary or an internship.
- He needs to be able to search on Google, Facebook and twitter for this information.
- He is most influenced by his friends, teachers and community.
- Mafu is interested in events and information regarding his community, he often looks for this on Facebook.

Figure 17. One of seven personas developed for the Cape Online system. This is the persona of "Mafu"

5.2 User Journey maps

Once personas were created, they were stuck on the wall and the process of user journey mapping began. User journey mapping was used throughout the research project, to maintain a visual high-level understanding of the experiences and practices these personas were engaging in, through the time period.

The manner in which these practices and experiences were mapped out initially, was with sticky notes which were always changing and moving around, or taken off or new ones were added. The content that was incorporated into this map were, the personas' goal and how this has motivated them to engage in their everyday practices, quotes from the research participants and lastly Cape Online areas related to the participants needs. This active engagement of mapping out the experiences were based on the research findings, the mapping process acted as a way to articulate the findings in a holistic way, to understand the over arching patterns of interactions.

Figure 18 shows the final user journey map which consists of the final states that emerged, which led to the current articulation of the Cape Online system, showing how these personas may navigate through the system relating to the particular need they may have. A larger version of this experience map can be found online at : http://inqubo.iranisangham.com/experience-mapping/

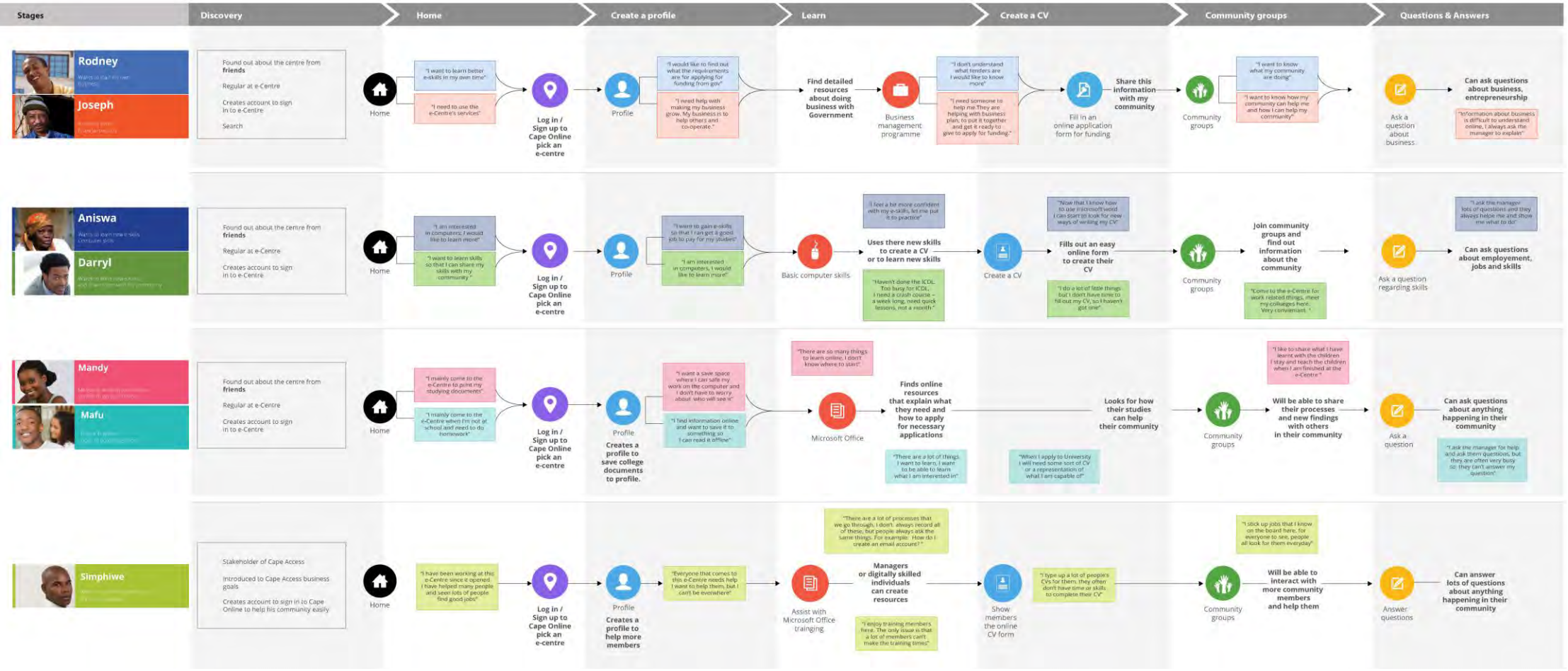


Figure 18. The final version of the user journey map developed for this research study.

5.3 Information architecture

While the assemblage of the user journey map was taking place, information architecture began to emerge. Information architecture refers to the way in which potential users will possibly navigate through a system in order to find the information they are looking for. The most logical instance showing how these personas may navigate to answer their own goals emerged and was depicted into a map to communicate a high-level view of the potential categories and tasks the users may potentially work through.

The information architecture map shows the main navigational areas where personas may begin their process and move towards deeper information they are seeking. These elements are shown in grey, they are the main menu items. Each of these sections consists of their own sub-level, which has been expressed, in a different colour, to show that it belongs to a different navigational main category. These main categories are:

1) Profile
2) Community groups
3) Learn (resources and courses)
4) Questions and Answers
5) In your area

Figure 19 illustrates the information architecture map, it shows the potentially most active category, which is the profile at the top. This is because a user will have to have a profile in order to interact with the categories shown below the profile. The information architecture map can be viewed in full scale online at: http://inqubo.iranisangham.com/information-architecture-map/

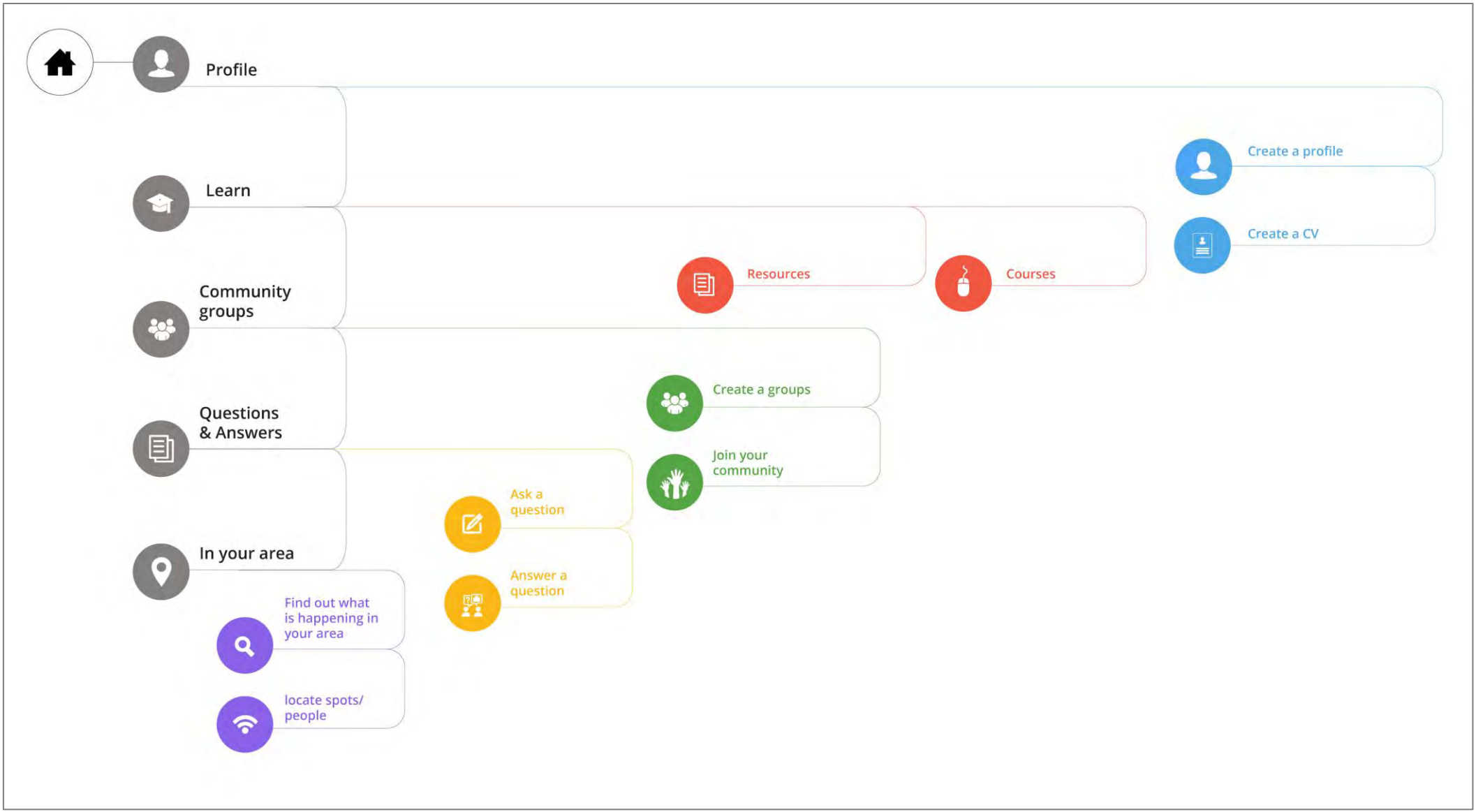


Figure 19. The final version of information architecture map developed for this research study.

5.4 Brand identity and visual language

The brand identity created for this system is called Cape Online. It was specifically designed for the purposes of this study in order to fit in with the research participant's style and what they were looking for. The brand identity or visual language was specifically created to mimic Facebook's interactive elements; because that was a system they were already very comfortable with. A minimalistic approach was taken in the design of the language in order to communicate a style of clarity, unclutteredness and to allow the user to easily find what they were looking for.

The use of colour was carefully incorporated and indicative of showing multiple listings within a category, for example the categories of questions and resources, may be have many listed resources or questions. Besides this example, a small palette was implemented in order to allow the user to easily find the necessary content, rather than getting overwhelmed with an abundance of colour and graphics.

The Cape Online brand was created for this system rather than using the existing Cape Access brand identity to ensure that it was not affiliated with Cape Access, this was to ensure that members would not expect to see the system produced by Cape Access. Cape Access stakeholders have not acquired the system, yet to be implemented, this is the proposed prototype. The logo uses a network cable and to clearly show users that the system is for accessing online information, it is called Cape Online, to clearly describe what the system aims at achieving, which is allowing members to go online and access technologies, which allow them to have internet access.

The user interface elements were designed to communicate the same paradigm through the system by using horizontal components which were designed specifically to be understood as easily clickable. The brand identity and visual language can be viewed online at: http://inqubo.iranisangham.com/visual-language/

Figure 21. The Cape Online logo

5.5 Wireframes

Once the preliminary work of diagramming, mapping and persona development began to take shape, elements of the interface began to show up in the designers mind and these needed to be recorded. First they were drawn out on paper and sketched out, this was mainly to make thinking tangible for the designer. The designer then went through the process of creating a black and white wireframe of the sketches in a programme called Balsamiq, which is a tool user experience designers use to create low fidelity wireframes.

These wireframes were also created in an iterative manner in order to adapt the thinking and conceptualising as it was happening, in this way, as a new concept would emerge it was put onto paper, then it was created into a wireframe, in order to understand the thinking within the final context, during the design phase.

Low fidelity wireframes are specifically created in order to understand the functionality of the system, this includes navigation and interaction of the elements, which need to be designed. This wireframe acts as a scaffolding of the Cape Online system. View all of the wireframes at: http://inqubo.iranisangham.com/wireframes/

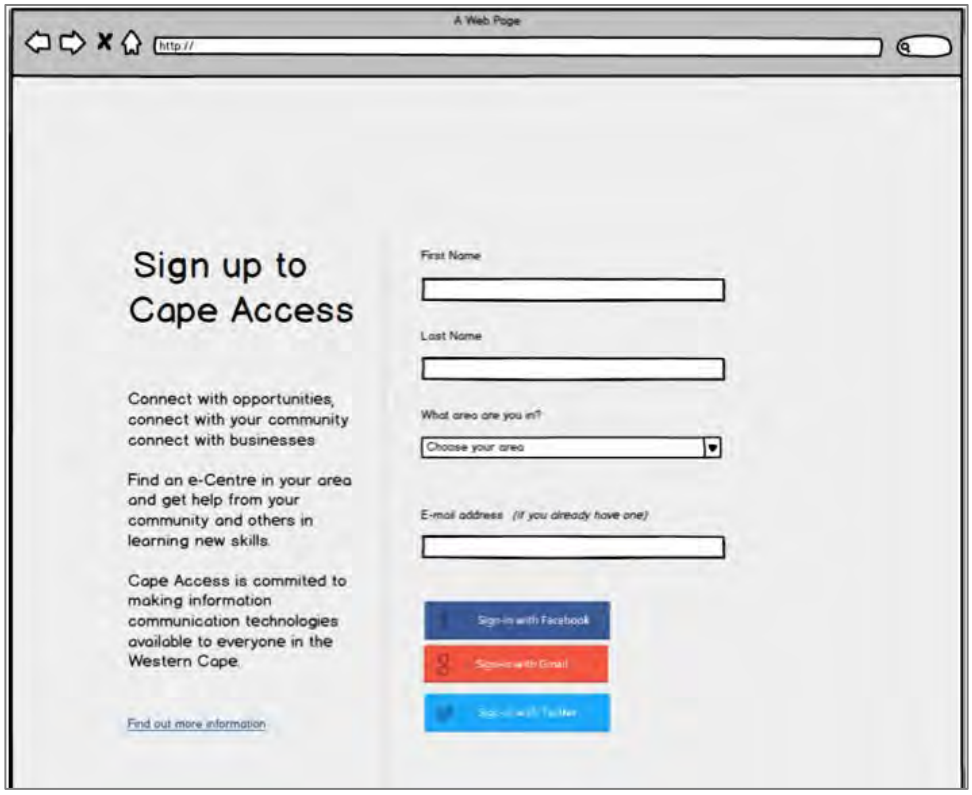


Figure 20. An example screen of the wireframes created for the Cape Online system

5.6 Photoshop detailed designs

Once the low fidelity wireframes had been put together the interface started to become clearer, the designer created detailed designs in Photoshop in order to flesh out as much detail as possible of the interface elements. These designs were created according to the necessary navigational sections in the system, for example, the questions and answers page, the profile page etc.

In the creation of these detailed designs, more questions regarding what kind of interactions were taking place began to reveal themselves as more elements were being designed. These emergent interactions began to form a clearer understanding of what the final prototype experience was going to look like. The landing pages of each category were designed in detail, these include: The profile page and creating a CV page, the questions and answers page, the resources and courses pages, community groups and in your area section. In the designing process the visual language and brand identity began to take shape and the articulation of the extension of the brand

began to represent the core identity of the brand essence. These detailed designs can be found online at: http://inqubo.iranisangham.com/detailed-designs/

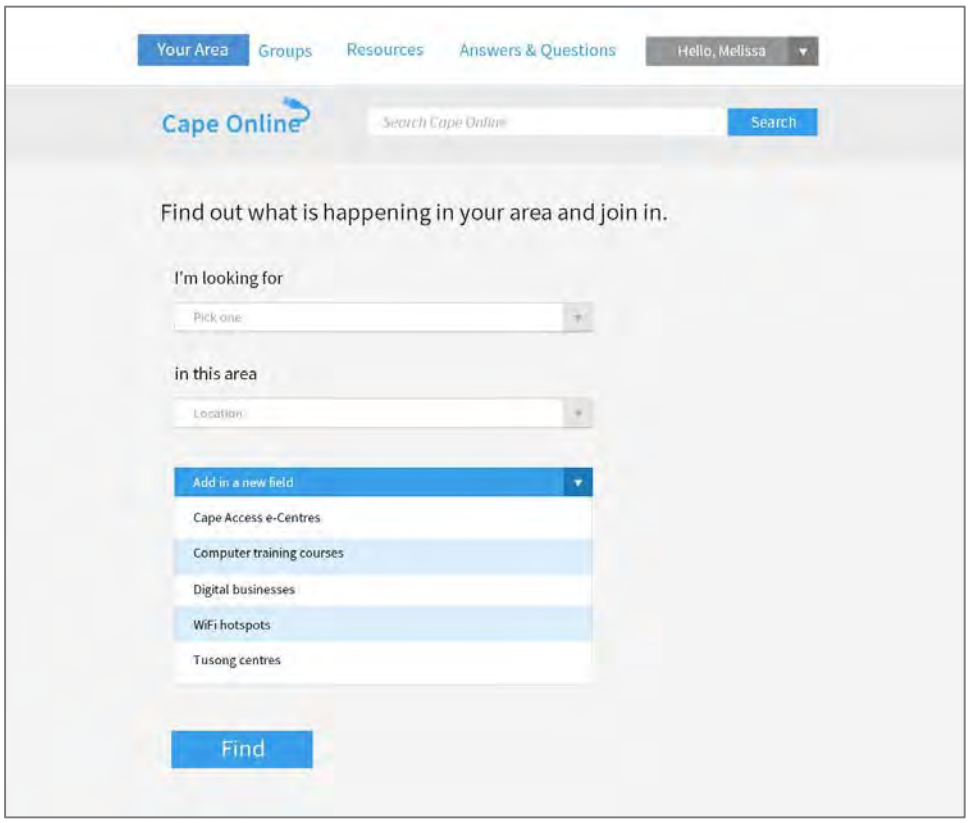
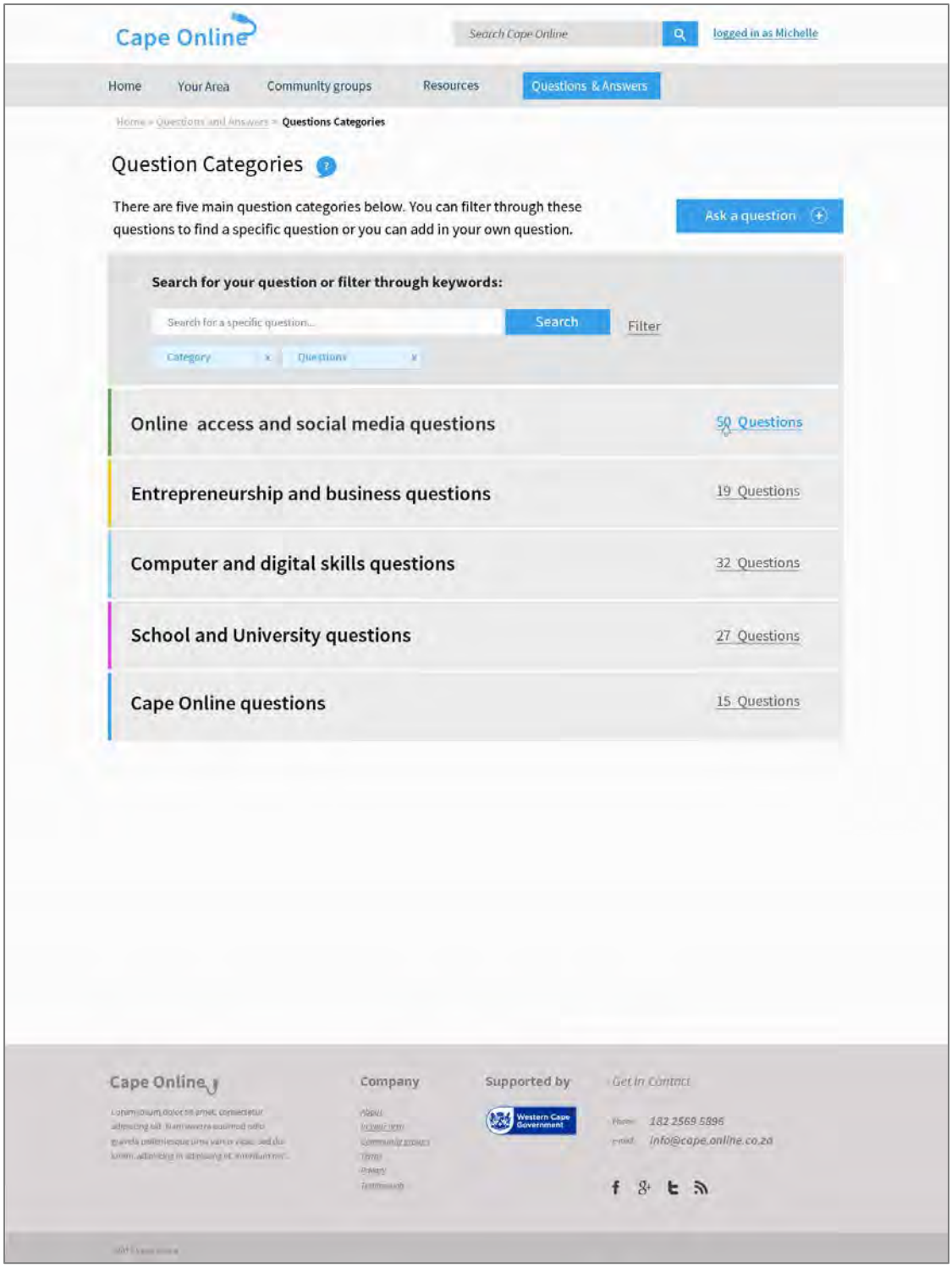


Figure 21. An example screen of the "in your area" section, which was one of the first designs created.



Figures 22. Shows an exmaple of the first designs of the Cape Online system "questions categories" screen showing the style of graphics used throughout the system.

5.7 Interactive Prototype

The interactive prototype was the final step of articulation of the Cape Online system, in this research study. The prototype was created with a web-based programme called UXpin, which is known as one of the best prototyping tools for user experience designers currently. The interactive prototype was designed to represent an experience, which would fit in directly with the research participants' practices, equipment and identities.

The Cape Online prototype was designed with the interactions and visuals of the system, which had been conceptualised throughout the project. This prototype is not complete yet, it is a work in progress that will be adjusted in an iterative manner as the designer digs deeper into the problem space and gets to understand the emergent future.

This interactive prototype is a culmination of the previous work that has been done, it incorporates all the previous artefacts as the final articulation, which will then be adjusted and changed as the research continues. The prototype can be found at: http://inqubo.iranisangham.com/prototype/

5.8 Alignment Diagram

The last artefact is an alignment diagram, which is based on the alignment model (figure 23) created and presented in the introduction chapter. This diagram describes the alignment created throughout this research between the citizens' needs and the business needs. This diagram lays out a high-level view of the interactions between business and the citizens in order to create a platform of participation between the two.

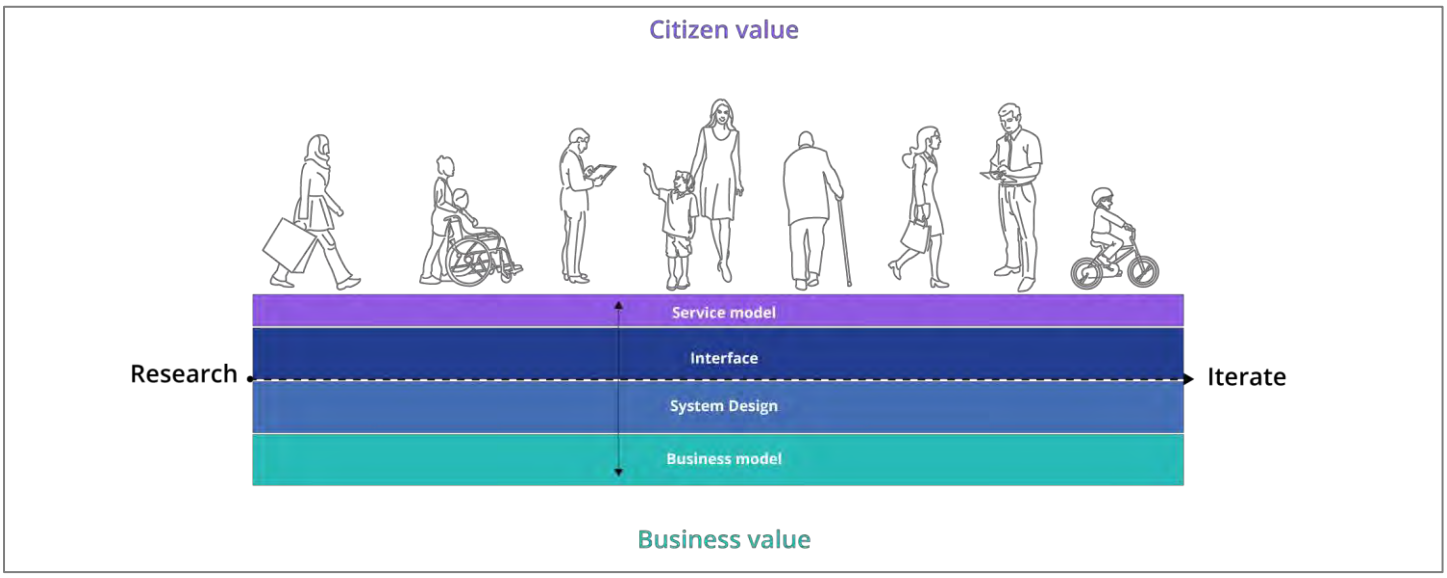


Figure 23. Alignment model

Figure 24, refers to the end result of the alignment map. The top layer lays out the artefacts described in this chapter and explains how they may align to the layer beneath it. The second layer refers to the interactions on the interface layer, these interactions are mainly from the e-Centre managers and the members of the e-Centres. The third layer, is the first layer beneath the touch point, or layer of interaction, system administrators and e-Centre managers perform the tasks on this level of the back-end of the system. This layer connects up to the invisible business requirements and processes, at this layer, the business decisions are implemented through the third layer. This last layer is the business model layer, where decisions about the *equipment, purposes* and *identities* are facilitated and managed. This business layer directly relates to the service model layer and coherently delivers an aligned system of interaction. The alignment diagram has not been described in the findings, because it represents the outcome of the alignment model proposed in chapter one. This alignment diagram concludes how the physical will maintain a platform to iterate on and move towards a platform of combined participation where citizen value interprets business value and business value interprets citizen value. As Anne-Marie Willis, (2006) defines ontological designing as " we design our world and our world acts back on us and designs us." This alignment diagram illustrates how this service model is designed to facilitate citizens (or e-Centre members) and the Cape Access business stakeholders to co-design their own world, and then for that same world (Cape Online

system) to act back on them and design them in their future making processes. The alignment diagram is online at: http://inqubo.iranisangham.com/alignment-diagram/

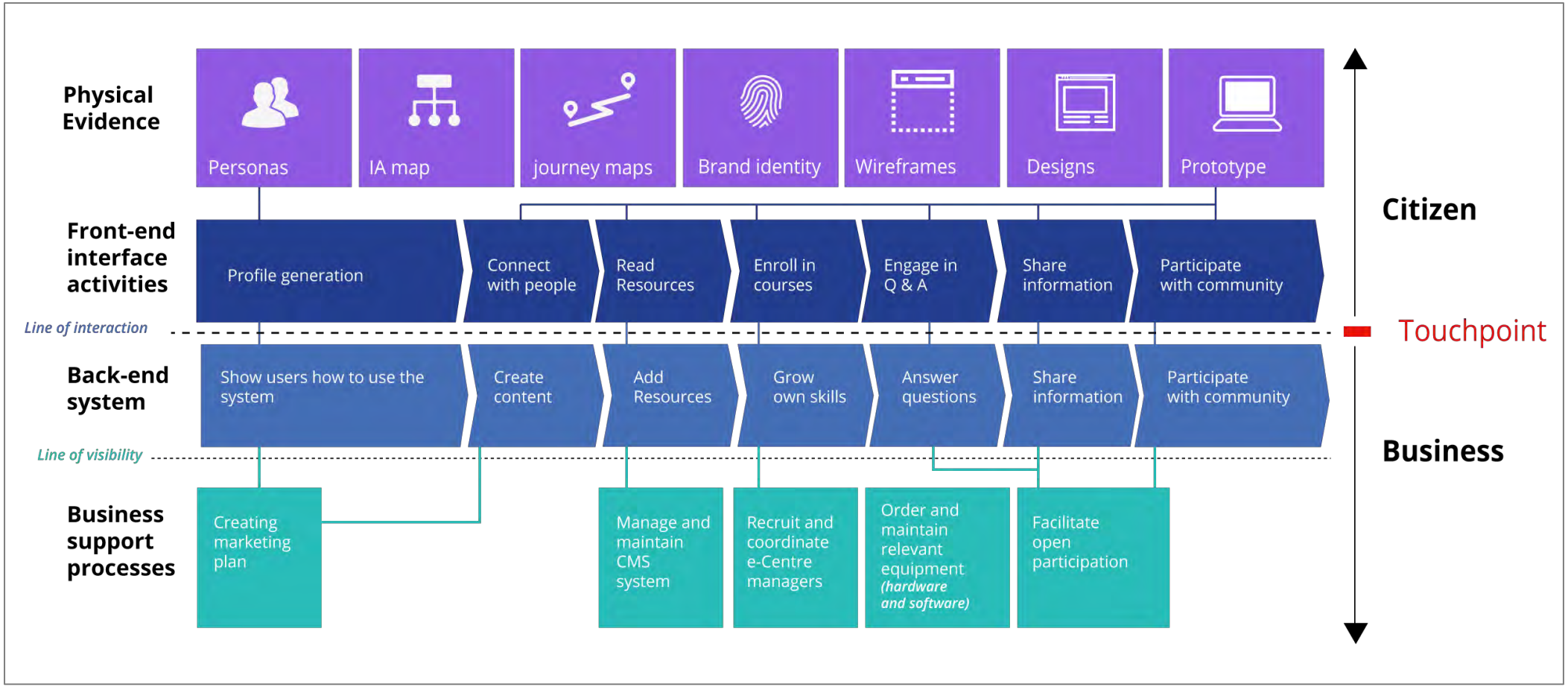


Figure 24. Alignment diagram implementation

Chapter 6: Conclusion

This conclusion is made up of three sections; the first section is a conclusion on the themes mentioned throughout this research, the second is two-part piece made up of two dimensions which address the research questions proposed in the first chapter and describe how they relate to the processes taken to answer these questions. The last part of this chapter will describe the possible next steps of this research.

6.1 Themes

6.1.1 Ontological designing.

This research study has revealed that through observing the situation of concern, the researcher was able to become sensitive to a shared history of the identities, purposes and equipment of the situation. The designer of the system was then able to co-design a platform of collaboration and participation for these identities to perform their activities, achieve their purpose and create new meaning.

6.1.2 Style and frame.

The style of Ubuntu had been used as a foundation from which the Cape Online style was built upon. This style of Ubuntu remains as the framework, from which these users may take it forward into the digital realm, adjust and transform it to suit their needs and the new identity's needs that may further define it.

6.1.3 Blindness, thrown-ness, present-to-hand and ready-to-hand.

This research has opened up a new understanding for the researcher of how being moves through the world, according to Heidegger, (1988; 2005; 2008) and Freire, (2000; 2005) and provided a set of tools to examine realities in order to transform them and in turn become fully human. This way of examining realities reveals a method in which to disclose how beings may occupy a certain place, and in turn how that certain place may affect their way of being.

6.1.4 Breakdown and innovation of Sense.

The way in which individuals are being in the world, reveals points of breakdown, from which they have the choice to transform (Scharmer, 2009) them and be fully human (Freire, 2000) or be authentic, (Heidegger, 2008) it is the point of transformation that designers must innovate and articulate meaningful systems.

6.1.5 Commitment.

Winograd & Flores, (1987), refer to communication being a process of commitment and interpretation. This research has been a record of the commitments between the designer, business stakeholders and the users of the system in order to reach a shared platform of participation and collaboration.

6.1.6 The role of the discloser.

The role of the discloser highlights an important concept that disclosers engage in the active transformation from *what is* to *what could possibly be*. In this research study, the role of the designer and the role of discloser are one and the same. The designer in this case engaged in the process of transforming *what was observed* in the situation of context into a *designed future solution*.

6.1.7 Designing disclosure.

The process of designing described and practised during this research study has created a platform that is usable, understandable, and relatable that facilitates meaningful conversations and new ways of dealing with the world. The designer was able to employ the emergence of new realities from the empirical understanding and shared experiences observed.

6.2 Research dimensions

The research dimensions articulated in the introduction chapter,will be answered in this section. This exploration was based from two roles relating to these very same dimensions which are; from the role of the designer in the creation of technologically orientated human activity systems and the role of technology in creating *new worlds* or ontologies for citizens. These research questions were based

on two fundamental practical dimensions that had prompted the research study. These dimensions are stated below in combination with the research questions proposed at the beginning of this research:

1) To create a design strategy for developing a system that is grounded in user-centered design process, which delivers both business value and citizen value.

    a) How does the process of design work at facilitating a better network and conversation that enables new social paradigms of interaction?

    b) How do designers prepare for future technological systems from which to liberate the potentiality of Being and how is this realized through the many current and future technological artefacts?

2) A learning platform for computer literacy and digital e-skills development, for the Western Cape Government's Cape Access programme.

    c. How do designers of digital government systems deliver value to the citizens and create better possibilities and practices inclusively?

The first dimension represents the process of design undertaken in this research study. This dimension will explain the design strategy embarked on during the development and facilitation of a better network and conversation to enable new social paradigms of interaction that create business value and citizen value.

The next dimension, will describe the creation of the technological artefacts presented in this research and the future-making effects it has on Being. This dimension will describe how being sensitive to the apparent shared historicity has given rise to a future platform for dialogue and participation.

6.2.1 The first dimension.

The design strategy used for developing the Cape Online system was distinctly Heideggerrian in that it had deconstructed underlying ontological assumptions within technology design. The style in which this was undertaken, refers to Heidegger's, (2008) key concepts of; *Blindness, thrown-ness, breakdown, commitment, style and*

frame. These key areas were used as a lens when dissecting the situation of concern, to understand it from a phenomenological point of view and to bring forth the relevant points of thrown-ness, breakdown and style.

The researcher then examined the observed reality, and extracted the key phenomena, of an emergent possible future system. A creative tension began to form through the accumulation of phenomenological understandings of the situation of concern and through this tension and innovative breakthrough revealed a set of possible practices to the researcher to act upon and articulate into presence (Scharmer & Kaufer, 2013).

The researcher then embarked upon the process of making sense of the revealed phenomena and articulating it into actuality. At this point the researcher had also begun their work as a practitioner or in this case, the designer, where they were acting out their abstract thinking into tangible artefacts to be experienced by others.

In so doing, these key concepts revealed a more fundamental mode of design thinking, one that was grounded in a user-centered approach throughout the articulation of outputs for this research. In this regard, this new mode of design thinking can be regarded as taking on a mode of *design doing*.

This design strategy was implemented in order to create multiple aware states of being, to facilitate possibilities for participants to transform and become fully human (Friere, 2000). As both Heidegger and Friere state, human beings must become aware and take control over the current situation in order to live to their potentiality. The researcher had undergone a design strategy, which aimed at creating a system that would use technology as a way in which beings can potentially adjust their *way of being* to be transformed and to become active participants in the upliftment of themselves and their community.

6.2.2 The second dimension.

In this research it was revealed that design serves as a practice from which to dissect problems and propose new practices. Design has multiple ways of disclosing new essences such as: mapping out the properties of the reality or situation of concern, investigating the practices that are taking place, laying out all the potential possibilities and then finding the best way to articulate the existing reality with a new proposed solution.

This proposed solution can then be experienced by stakeholders and users of the system. During these experiences, new breakdowns are revealed to the designer that can be acted upon to maintain an adaptive system of interaction for further dialogue. This iterative procedure of observing, reflecting, designing, adjusting is taken from Freire's (2000), explanation of praxis, Wendt's (2015) description of design for Dasein and refers to Heidegger's notion of *unconcealment*. This procedure also calls upon theories from user-centered design principles and design thinking theories and integrates them to form a new understanding of *designing disclosure*.

This means that there are multiple ways of approaching the world, multiple ways of *knowing* and *being.* It is the role of technology to bridge these multiple narratives, in a synthetic and integrative manner; such that new worlds, new ontologies are born which act as *common ground*, in the creation of solidarity and shared practices. In this research it was discovered that technology served as a platform on which to articulate what the designer had imagined and then to share it with the potential users in order to begin a dialogue between the designer, the designed and the to be designed.

In this regard, technology has served as an extension of the thoughts, imagination and observation that the designer had in their mind into an experience for others to be immersed within. By utilizing creativity, the designer (or the discloser) tested a design practice as a way of transcribing the observation of *what is* into *what could be*. In other words, the use of creativity and design practices had transformed the phenomenon experienced by the designer into a world, through the use of technology. This is designing disclosure.

6.3 Next steps

The Cape Online system has opened up many research opportunities for further investigation. Due to this research being iterative, there can be multiple user testing rounds held, where feedback is provided and further discussions on the finer workings of the user interface are defined. Each of the described sections in the prototype can be designed further, through heuristic evaluations of the interface. This platform allows for a deeper investigation into the iterative processes needed to venture into so adjusting it to the practices of the participants.

The process and physical evidence produced during this research study can be found online at: http://inqubo.iranisangham.com/

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