Cape Peninsula
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Mapping Product design as a transdisciplinary service

by

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DECLARATION

I, Jessica Courtney Kühlenthal, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

08 September 2018

Signed **Date**

ABSTRACT

Design is a highly complex process. It involves various stakeholders, processes and interactions that need to work coherently in order to result in a successful design or product. It needs to be acknowledged that offering design as a successful service is not simply an interaction between a customer and a single designer, but in reality is far more complex and detailed.

In today's society, it is no longer sufficient for design-businesses to only focus on providing a well-designed end product. Instead, customers now seek value in superior experiences from the services they use. Design-businesses thus need to shift their current outward focus to also create and design superior service experiences. Owing to the intangible complexities and intricacies within design as a service it makes it incredibly challenging to improve or enhance.

Skeg Product Development, a leader in the Product design industry in South Africa, was used as a single case study to offer a real-world working context of Product design as a service. This study used purposefully selected Service design tools and techniques, such as the customer journey and service blueprint, for co-design workshops. Three workshops were facilitated in order to co-design maps with employees from various functions within the case study. Workshop 1 required participants to map their ideal customer journey. This was used to identify an area of focus within the case study that would benefit the most from improved visualisation. Workshop 2 and 3 used a service blueprint to map the existing front of stage- and backstage interactions and processes respectively. The mapped findings were supplemented by informal interviews with employees as well as continuous observations within the case study.

It was found that Product design as a service, although the experience is subjective to each customer and project, is filled with intangible challenges and intricacies. It had been identified that managing customer expectations is currently the biggest challenge in offering Product design as a service. Although this was found to be a crucial obstacle to the customer experience, with multiple discussions around the topic, very little is actively being done to address it. It was also identified that current internal processes are not completely understood in terms of what they entail or their purpose to the service. This was found to be especially true across the various functions. This holds significant consequences for employees, the service and ultimately the customers.

During the course of the study a number of themes and topics emerged. These include the success criteria for Product design as a service, as well as the significance of understanding roles and processes. The challenge of managing customer expectations in an unpredictable context is also addressed. The study subsequently presents two means for design-businesses to shift their focus to

backstage processes in order to mitigate this challenge. The emerged themes speak to the greater industry of Product design as well as the developing field of Service design.

This research is aimed at any individual, business or employee involved in the design industry. This includes anyone who has a role in delivering design as service who could benefit from a clearer understanding of the challenging context in which they work. It would also be beneficial to an individual or business who may want to suggest adjustments or changes to improve design as a service in future.

Keywords: Product design, transdisciplinary service, complexities, processes, experiences, mapping, Service design

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GLOSSARY

Customer expectations	Customers instinctively compare each new experience, positive or negative, with previous encounters and judge accordingly. These are subjective and vary from customer to customer (Meyer & Schwager, 2007:3).
Customer experience	The internal and subjective response customers have to any direct or indirect contact with a business (Meyer & Schwager, 2007:2). This constitutes everything a customer sees, hears and otherwise experiences whilst interacting with the business (Arroniz, Sawhney & Wolcott, 2006:79).
Customer journey	A map used to view customers' experiences on a more granular level in order to focus on a specific aspect of the service and how it is portrayed (Brand-Flu, Lovlie &Reason, 2016:167).
Customer	Individuals that use or consume a business' offering to satisfy their needs (Arroniz, Sawhney & Wolcott, 2006:79).
Design	To form or build towards an intended purpose. This is a subjective verb as it varies according to the context and who is using it as many professions perform the act of *designing* (Heskett, 2003:3).
Employee experience	The experience an employee encounters in their working context based on the technical environment, this is the tools and processes used to perform their job, and their physical environment (Forbes, 2018).
Experience	The process of attaining knowledge or skill from doing, seeing, or feeling things (Cambridge University Press, 2018). People cannot help but have experiences
Functions	An area of responsibility usually involving specialised education, training and experience. In Product design these functions typically include design, marketing and manufacturing functions (Ulrich & Eppinger, 2012:25).
Interaction	An occasion when two or more people or things communicate with or react to each other (Cambridge University Press, 2018).
Map	A form of translation, collecting data and transforming it into a visual format (Vizard, 2017:50).
Process	A sequence of steps that transforms a set of inputs into a set of desired outputs (Oxford University Press, 2017).
Processes	Configurations of business activities used to conduct internal operations (Arroniz, Sawhney & Wolcott, 2006:79).
Product design process	A process with a particular set of activities that are employed to brain storm, design and commercialise a product (Eppinger & Ulrich, 2012:12).

Product design[1]	A set of activities beginning with the perception of a market opportunity and ending in the production, sale, and delivery of a product. Used synonymously with the term Product development (Eppinger & Ulrich, 2012:2).
Product	Can be seen as the outcome of a process. The form varies across disciplines; for example, in the field of Engineering design the product is the mechanical components, whereas in Industrial design a product is a physical artefact (Kim & Lee, 2010:1795).
Service blueprint	A detailed visual representation of the total service over time which maps the customer's journey and subsequent touchpoints and avenues as well as behind the scene interactions within the service organisation (Davies & Wilson, 2015:19).
Service design maps	Represent and describe services, experiences and systems as we understand them, or as we would like them to be (Vizard, 2017:48).
Service design	Is an interdisciplinary approach that combines different methods and tools to make the services we use more usable, easy and desirable (Schneider & Stickdorn, 2011:29).
Service experience	This consists of the customer experience, employee experiences and any mechanism that influences these experiences such as touchpoints, processes, the service setting and the end product (Business Dictionary, 2018).
Service provider[2]	An organisation that conducts a service to address customer needs in return for remuneration (Schneider & Stickdorn, 2011:51).
Service	A process- and experience-based encounter, which strongly relies on interpersonal delivery systems to deliver value to an end user (Bitner, Ostrom & Morgan, 2007:2).
Stakeholder	A stakeholder is a person that has a legitimate interest in a project or entity. This includes employees, suppliers and customers (Tassi, 2009).
Touchpoints	Every point of contact between a customer and the service provider (Schneider & Stickdorn, 2011:35).

[1] Please note that professions and industry names will be mentioned in this study with the first letter of the first word as a capital letter.

[2] Please note that for the purposes of this study the terms business, design-business and service provider are used to refer to a business that offers design as a service.

Transdisciplinary	Relating to more than one branch of knowledge. Transdisciplinarity occurs when two or more discipline perspectives transcend each other to form a new holistic approach (Oxford University Press, 2017).

Abbreviations

CEO	Chief Executive Officer
COO	Chief Operations Officer
PO	Purchase order
TA	Thematic analysis
SOP	Standard operating procedure

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1 CHAPTER ONE: INTRODUCTION

1.1 Introduction to the context

The world of Product design often requires stakeholders to operate in unchartered territories, especially when designing superior products in the innovation space. There is no generic approach when it comes to designing a superior product as every design-business, product and customer has their own set of requirements. In order to navigate in this unpredictable and challenging space Product design draws experience, knowledge and skills from its employees in various professions. Thus it needs to be acknowledged that offering design as a successful service is not simply an interaction between a customer and a single designer; but in reality is far more complex and detailed.

In South Africa, there are very few businesses that offer the complete transdisciplinary service of Product design; some businesses offer design in the form of ideation, sketching and conceptualisation while others offer prototyping and manufacturing services. In Cape Town specifically, there is only one Product design business that offers the full transdisciplinary service of Product design, from ideation through to prototyping, engineering and manufacture, under one roof; Skeg Product Development. [3]

In essence, Product design as a transdisciplinary service relies on the transfer of information between the functions and employees of the business. It is imperative that information is communicated succinctly for the successful implementation of the Product design service.

1.2 Statement of research problem

Offering design as a service is a highly complex process. It involves various stakeholders, processes and interactions that need to work coherently in order to lead to a superior design or product (Eppinger & Ulrich, 2012:6). In today's society, it is no longer sufficient to only focus on providing a well-designed end product. Customers now seek value in superior experiences from the services they use (Bitner, Ostrom & Morgan, 2007:2). Design-businesses thus need to shift their current outward focus to create and design superior service experiences. Owing to the complexities found within

[3] Find more information regarding Skeg Product Development, their service capabilities and Product design processes at: www.skeg.com.

design as a service it makes it difficult to manage or track. This in turn makes it incredibly challenging to try and improve or enhance.

1.3 Background of the research problem

With the ever-changing customer demands in the present world, it has become vital for businesses to create long term success and sustainability. In order to achieve this, design-businesses need to broaden their focus to ensure that they are offering more than just a well-designed end product, but also a well-designed and all-round superior service experience.

It is important to note that the service experience involves the external customer experience as well as the internal employee experiences (Business Dictionary, 2018). Figure 1.1 illustrates the various aspects involved within a service experience and the factors that contribute to a successful experience.

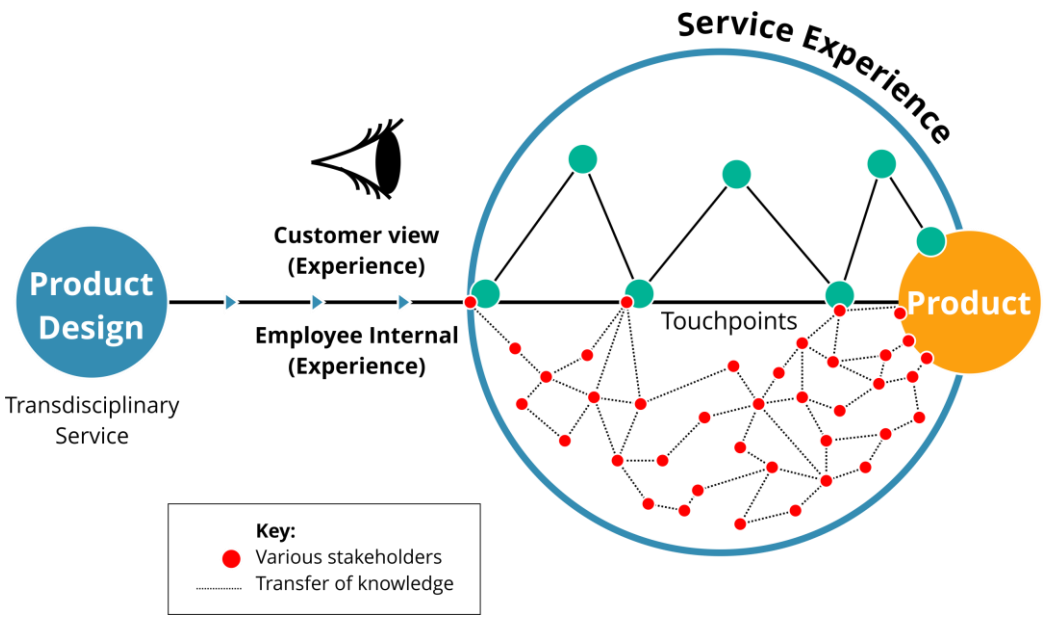

Figure 1.1: Graphic representation of Product design as a service experience

Produced by: Author, 2018

The graphic indicates how Product design as a service cannot solely focus on producing a well-designed end product as this will only partially fulfil the need to create a superior service. Instead focus needs to be placed on experiences, including the customers view and perception of the service, as well as enhancing the employees' experiences in providing the service. Only then will the transdisciplinary service of Product design achieve a superior service experience.

Product design is an industry filled with intangible challenges and intricacies. As the process of Product design relies on the transfer of knowledge and information it is crucial to the implementation of the service that processes and interactions between stakeholders occur optimally (Bernard, Chandrasegaran, Gao, Harik, Horvath, Ramani, & Sriram, 2013:208). In addition to this, the Product design process in practice draws a number of different professions together and the iterative and unpredictable nature can create challenges to deliver end products to customers on deadline and within budget (Eppinger & Ulrich, 2012:6).

Thus there is a definite need for a mechanism to better represent and understand the internal complexities of offering Product design as a service and the subsequent impact this has on the customer experience. Thus before one can reflect on these constructs, a more detailed map of design as a service is required (Bitner et al., 2007:5). Beyond a model of process, which highlights phases, a detailed blueprint of the complexity of design as a service can identify operational dependencies, challenges and thus opportunities within a design-business (Schneider & Stickdorn, 2011:205). A mapping benefits not only the business as an entity but also holds significant value to the customers and employees involved in the implementation of the service (Brand Flu, Lovlie & Reason, 2016:12).

Simply put, if one does not understand what occurs during the Product design process or why, one cannot do it better, faster or more cost effectively.

1.4 Aims and objectives of this study

This study aimed to address the intangible challenges found within Product design through visualisation. A visual representation of the stakeholders, processes and interactions as well as the transfer of knowledge will create a tangible and easy to understand map of Product design as a service.

Using suitable mapping techniques the mapped outcomes aimed to clarify complex processes as well as the role and responsibilities of various employees and functions. A mapping also aimed to show the relevance of processes relative to stakeholders in the service. And finally, the map aimed to serve as a platform for insightful discussion to ensure full understanding amongst employees and functions. These discussions could form a strong foundation and assist the design-business to build towards enhanced employee experiences, improved customer experiences and ultimately promote a superior service offering.

1.5 Main research topic, question and sub-questions

1.5.1 Main research topic

The approach to this study has been illustrated graphically in Figure 1.2 to assist in understanding the aims, objectives and focus of this study. The graphic indicates four phases of research from the start of the study until achieving its goal of mapping Product design as a transdisciplinary service. The graphic closely resembles Design thinking's Double diamond. This approach was employed to ensure that the study remained iterative and structured (Stickdorn & Schneider, 2011:126).

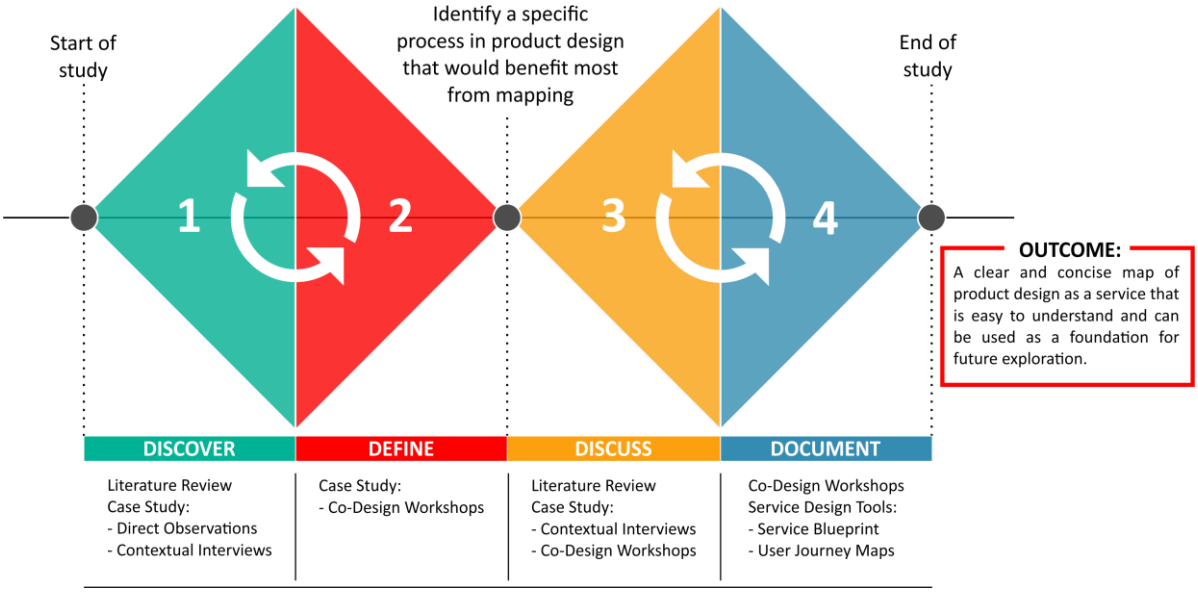

Figure 1.2: Graphic breakdown of research approach

Produced by: Author, 2018

The first phase of research was to (1) Discover; this is where the field of Product design and services were explored to gather as much information and understanding around the context as possible. This was done predominantly through exploring recent literature, direct observations and contextual interviews within the case study. The study then (2) Defined; this is where the study delineated and focused on a particular process within Product design. This was necessary in order to create a focus point and boundaries for the study. This was accomplished through a co-design workshop with employees from the case study; which allowed the employees to identify where in their existing working context a visualisation would hold the most value.

After the study was delineated, it was necessary to (3) Discuss the selected area of focus in greater detail to gain full and complete understanding. This was conducted through exploration into recent literature as well as co-design workshops and contextual interviews with employees from the case

study. Finally the study (4) Documented the findings through the use of Service design tools and techniques. These tools and techniques were specifically selected in order to achieve the aims and objectives set out by this study.

1.5.2 Main research question

1. How can the internal complexity of Product design be supported through the mapping of the process as a transdisciplinary service?

1.5.3 Sub-questions

1.1 What are customers typically experiencing when subjected to Product design as a service and how does this impact their expectation of the service?

1.2 What practices and processes currently exist within the transdisciplinary Product design process?

1.3 What are the complexities in the Product design process, when mapped internally from a service perspective?

Table 1-1: Breakdown of research questions

Research questions	Why?	How?
Main research question: How can the internal complexity of Product design be supported through the mapping of the process as a transdisciplinary service?	○ To create a means of understanding and addressing customer and employee experiences in an informed and insightful manner. ○ In order to build towards creating a superior service experience for all stakeholders.	○ Literature review ○ Co-design workshops ○ Direct observations ○ Contextual informal interviews ○ Thematic analysis of findings
Sub-question (1.1) What are customers typically experiencing when subjected to Product design as a service and how does this impact their expectation of the service?	○ To gain insight and better understanding towards customers and their experiences and expectations from the existing service offering. ○ To place emphasis on the customer in order to design improved experiences and better manage their expectations.	○ Literature review ○ Direct observations ○ Co-design workshops ○ Contextual informal interviews
Sub-question (1.2) What practices and processes currently exist within the transdisciplinary Product design process?	○ To force the design-business to shift its focus inwards to view their service from multiple perspectives. ○ In order to clarify and crystalise intangible processes and inter-dependencies to gain a clearer understanding of the internal complexities of Product design as a service.	○ Literature review ○ Direct observations ○ Co-design workshops ○ Contextual informal interviews

Research questions	Why?	How?
Sub-question (1.3) What are the complexities in the Product design process, when mapped internally from a service perspective?	○ To gain a more holistic understanding behind currently implemented processes and complexities. ○ To provide a means to assess a process' relevance and if it can be improved or enhanced.	○ Direct observations ○ Co-design workshops ○ Contextual informal interviews

Collated by: Author, 2018

1.6 Ethics in practice: An introduction

Ethical considerations were fundamental to the research methods conducted in this study. This study aimed to create a visual representation of stakeholders, processes, interactions and the transfer of knowledge in the current real world workings of Product design as a service. As these intangible entities are specific to the design-business and respective employee, it is seen as their intellectual property. Therefore it was imperative to consider the ethical practices throughout this study. A documented breakdown of the study was presented to the case study in order to gain consent before the study commenced. Participants of the study were also provided with a description of the research and its objectives in order to acquire signed consent. The ethical considerations are explored in greater detail in Chapter 3: Methodology (section 3.6).

1.7 Organisation of the chapters

The Chapters of this study are structured to provide the reader with a concise and comprehensive flow of research and information. Once the research problem has been introduced and briefly explained, the literature review covers three fundamental topics. It explored the context of Product design; what it is, who is involved and typical challenges. The literature review also expands on the shift in value; from products to experiences and services. And thirdly addressed the design of services; this included the new relevance in design and established mapping tools that support reflection and understanding.

The Methodology Chapter addresses topics relating to the research conducted, more specifically what research methods were used, why and how. It also justified the use of a single case study research methodology and its significance to this particular study. This Chapter also included the use of Service design as a conceptual framework, the approach of a Thematic analysis of findings, ethical considerations and sampling of the study.

The Findings Chapter reported findings and outcomes chronologically. From this Chapter, the reader can expect a detailed breakdown of outcomes from the employed research methods. This section includes three co-design mapping workshops, three contextual informal interviews with employees, observations relevant to the study and a collaborative evaluation and analysis of the findings in the form of a workshop. The Discussion Chapter is built on the topics and themes that emerged throughout the findings. These topics include: what constitutes a satisfied customer, processes and roles within a design-business and the implications of a lack of understanding. It also explores the challenges associated with managing customer expectations and presents two means of addressing these challenges internally.

Owing to the expanse of topics and themes addressed in this study, the Conclusion and Recommendations Chapter has been structured into four concluding sections. (1) The methodological conclusion; this focused on the outcomes and conclusions that were generated as a result of the research methods employed by the study. (2) The service conclusion; this section addressed the greater objective of “understanding Product design” in the current world workings. (3) The framework conclusion; this explored and reflected on the use of Service design as a conceptual framework to the study. And (4) the auto-ethnographic conclusion; this allowed the researcher to reflect on the study and the subsequent outcomes. This Chapter also presented recommendations for future exploration into the fields of Product design, transdisciplinary services and Service design.

2 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Over the past two decades there has been rapid and sustained growth within the service industry (Schneider & Stickdorn, 2011:14). This literature review explores this development through the findings of relevant authors and experts in the field. The literature included originates from authors and sources with varying backgrounds ranging from Engineers and Industrial designers to Professors in Innovation and Design leaders in business. Keywords such as *Product design, design challenges*, *service growth* and *Service design* were used in various databases to draw the academic literature used in the review. These databases include *Ebscohost, Proquest* and *Google Scholar*. It was important that the literature was specific to Product design and the act of designing as a service. It was also important that the literature selected was published within the past 20 years as this would insure that the information is up to date and still relevant. The literature also originates from both first- and third world contexts as to mitigate any bias in the review.

The review defines *Product design* as a field in order to gain a better understanding of the context. This includes the functions involved in the practice of Product design, how it is offered as a service and complexities in the industry. With the rapid growth and development in economies there has been a shift in where value lies in order to be a successful business. This shift in value is explored as well as the subsequent new role of design within society. The review addresses the exciting new relevance and role of design and the emergence of the Service design field. The objective of this literature review is to gain full understanding and insight into the transdisciplinary service of Product design and briefly address how Service design tools, such as mapping techniques, can benefit it.

2.2 Understanding Product design

Before the nuances of the Product design process can be further explored, it is important to address the confusion around the term *design* and the significant value it adds. *Design* as a process is omnipresent; this means that it presents itself in many forms on a day to day basis (Bernard et al., 2013:204; Heskett, 2003:1). A key reason why design becomes complicated to define is because its meaning and interpretation varies according to who is using it, who it applies to and what the context is. *Design* is also very broad, as there are many professions that are involved in the act of “designing” (Heskett, 2003:3).

In fact, Richard Buchanan, a well-known professor of design, management and information systems, views this lack of definition as advantageous, he says:

> One of the greatest strengths of design is that we have not settled on a single definition. Fields in which definition is now a settled manner tend to be lethargic, dying, or dead fields, where inquiry no longer provides challenges to what is accepted as truth (Schneider & Stickdorn, 2011:28).

Therefore the difficulty in defining the term *design* is viewed as an advantageous challenge, but what does it mean to design a product specifically.

2.2.1 What is Product design?

In order to define Product design it is necessary to begin by clarifying what is meant by the term *product*. Eppinger and Ulrich (2012:2) define a *product* as "…something sold by an enterprise to its customers". Kim and Lee (2010:1795) elaborate that a *product* varies across disciplines. For example, in the field of Engineering design the product is seen as the mechanical components, whereas in Industrial design a product is viewed as a physical artefact. With this in mind, the term *Product design* can be defined as a:

> …set of activities beginning with the perception of a market opportunity and ending in the production, sale, and delivery of a product. (Eppinger & Ulrich, 2012:2).

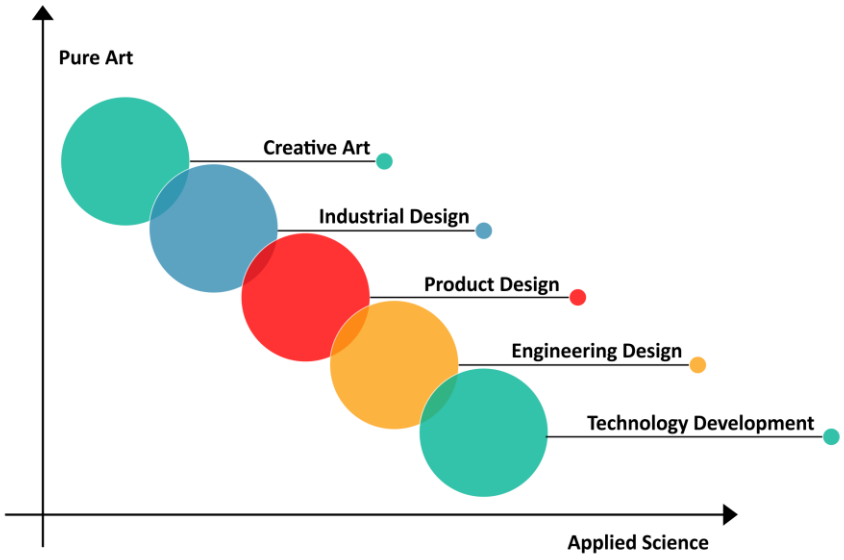

Figure 2.1: Position of Product design

Produced by: Author, 2018

Adapted from: Kim & Lee, 2010:1796

Figure 2.1 shows how Product design manifests closely between the fields of Industrial design and Engineering design. This has led to *Product design* used synonymously with the term Product development (Kim & Lee, 2010: 1795). Therefore, the discrepancy in terms of defining *Product design* can be seen as a result of it integrating itself in multiple disciplines that aim to accomplish the common goal of developing a new *product* for customers (Kim & Lee, 2010:1795).

2.2.2 Who is involved in the Product design process?

The successful design of products requires input from various professions and disciplines. This means the team of individuals working on developing a physical product involve employees with a wide range of training, experience and perspectives (Eppinger & Ulrich, 2012:6). This is a complexity in its own right as each individual has their own set of inputs into the product but use varying methods, communication tools and perspectives which do not always come across coherently.

Before assessing who specifically is involved in the Product design service, it is important to define and clarify what is meant by the term *transdisciplinary*. The terms multidisciplinary, interdisciplinary and transdisciplinary are commonly used to imply various degrees of academia interacting for a predetermined purpose. Transdisciplinary in particular aims to go beyond individual disciplines in order to achieve unity of knowledge (RUNIN 2019). According to Oxford *transdisciplinary* activities occur when two or more discipline perspectives transcend each other to create a new holistic approach (Caldwell, 2015). This approach developed through the need to address complex challenges. However, with this comes the integration of knowledge from various perspectives across stakeholders. This requires redefinition especially in multi-stakeholder contexts, such as design services, where communication and information can easily be misinterpreted (RUNIN 2019).

It is advocated that transdisciplinary teams are involved in the process of Product design in order to collaborate with collective expertise, information and experience for development and problem solving purposes (Browning & Danilovic, 2007:301). As Product design is an interdisciplinary activity, it requires the contribution from nearly all functions of a business. As seen in Figure 2.2 over leaf; these core functions include the marketing, design and manufacturing functions. Gronroos (1990:3) explains that the marketing function typically mediates interactions between the business and its customers. This function also identifies product opportunities, market segments and customer needs. It is however the design function that plays the lead role in defining the physical appearance and form of the product as well as its operational capabilities to best meet customer needs (Eppinger & Ulrich, 2012:4). This function includes Industrial designers as well as Engineering designers, typically Electrical or Mechanical engineers. Industrial designers are mainly focused on the aesthetics

and ergonomics of the product while the Engineering designers are more inclined towards a product's mechanics, electronics and software. While the manufacturing function on the other hand is primarily responsible for designing and coordinating the production of the physical product (Massey, Montoya-Weis & Schmidt, 2001:578).

It is important to note that it is not only the Industrial designers, Engineers and Manufacturing employees that are involved in the practice of Product design. There are numerous supporting design activities that assist and contribute towards the core team in designing the end product (Kim & Lee, 2010:1796). These supporting functions play a smaller role in terms of designing the physical product but play a pivotal role in the overall functional capabilities of the business (Eppinger & Ulrich, 2012:3).

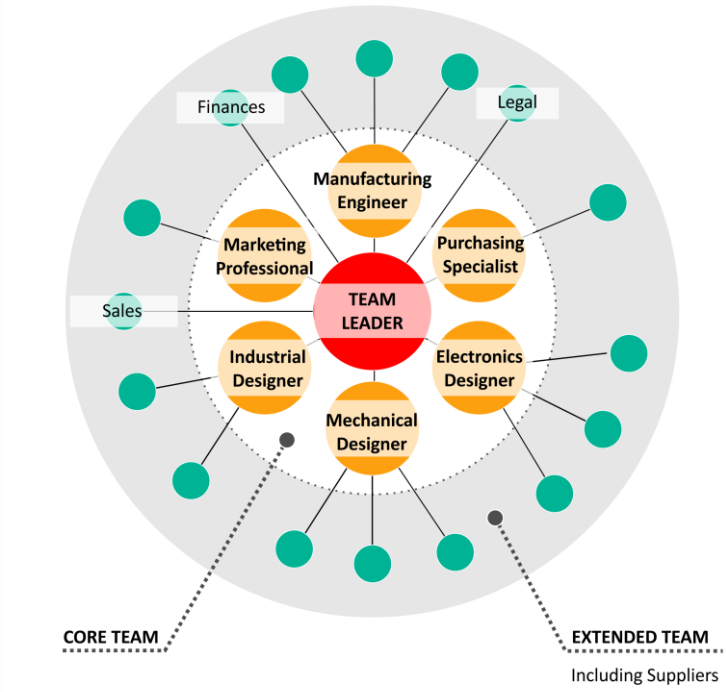

Figure 2.2: Product design team breakdown

Produced by: Author, 2018

Adapted from: Eppinger & Ulrich, 2012:4

As evident in Figure 2.2, in traditional Product design there is a team leader, a core team and an extended team. The number of people in these categories varies per business and in some cases individuals are involved in multiple teams. The extended team include internal members such as finance and sales, but also extend to include legal advisors and material stockists and suppliers, these

are commonly external and function independent of the business (Edmondson, 2003:1420; Kichuk & Wisener, 1997:196).

It is crucial to the success of the Product design process that these teams communicate and work together in a systematic and coherent manner. According to Eppinger and Ulrich (2012:4), supported by Heskett (2003:38), this is commonly where the majority of the complexity and challenges of Product design originate.

2.2.3 Reflecting on Product design as a process

In order to address Product design as a process it is necessary to take a closer look into what it entails to offer it as a service. At this point it is important to acknowledge that every Product design business employs a process that is slightly different from the other; this is to accommodate the business' unique characteristics and approach (Wirtz, 2016:6).

By general definition a *process* is a sequence of steps that transforms a set of inputs into a set of desired outputs (Oxford University Press, 2017). With this in mind, the act of Product design is a process containing a specific set of activities that are conducted in order to brain storm, design and commercialise a product (Eppinger & Ulrich, 2012:12).

Design is loosely described as a human problem solving process and therefore deducts that every design process has common points. Hence design problems start with the perception of a problem and end in some form of solution, this solution varies according to the field of design. The problem thus evolves into a solution through the design process (Kim & Lee, 2010:1795). The challenge presents itself when various disciplines adopt differing design processes and methods (ibid). According to Eppinger and Ulrich (2012:13) the Product design process consists of 6 phases, namely planning, concept development, system-level design, detail design, testing and refinement and production ramp-up. The process begins, like most processes, with planning. The output of this phase is essentially the project's mission statement, which is the input required to start the second phase, concept development. This mission serves as a guide for the various functions and design teams. And so, the process continues with each phase building on the phase that precedes it. This can be seen in greater detail in Figure 2.3.

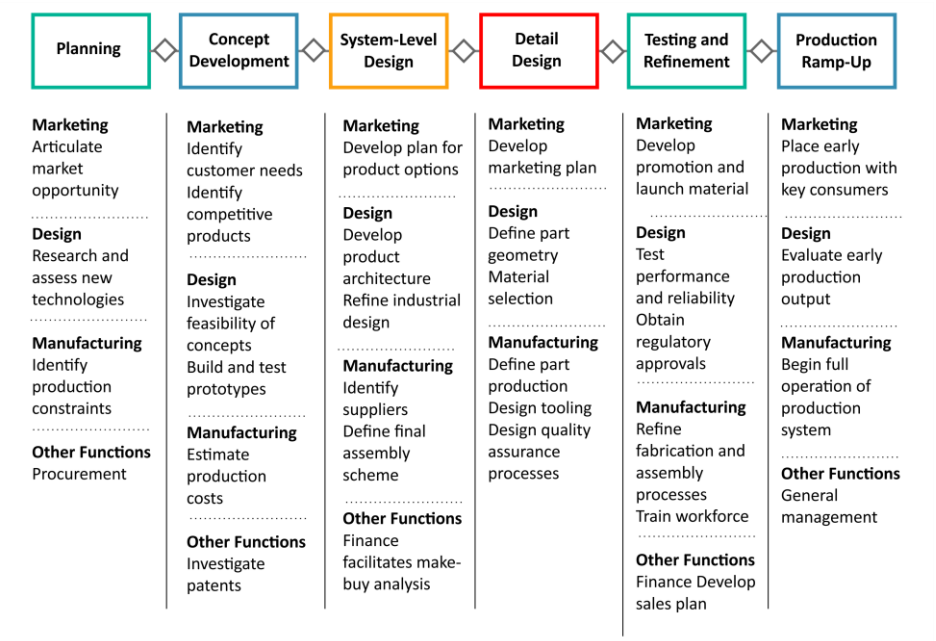

Figure 2.3: Product design process

Produced by: Author, 2018

Adapted from: (Eppinger & Ulrich, 2012:13)

One way to think about the Product design process is to consider it as an information-processing system (Eppinger & Ulrich, 2012:13). This view is shared by Bernard (2013) who represents the design process in terms of knowledge representation, as evident in Figure 2.4.

Bernard (2013) have adapted this design process from Pahl and Beitz (1988), who viewed the process in terms of knowledge representation (Theories about Engineering, 2012). For example, requirements modelling to concept design involve predominantly linguistic and pictorial representations; such as concept sketches and requirements. Whereas the embodiment design phase contains more symbolic and algorithmic representation such as product architecture, mathematical calculations and material selections. Detail design is mainly virtual and involves 3D models, a bill of materials and manufacturing processes (Bernard et al., 2013:208).

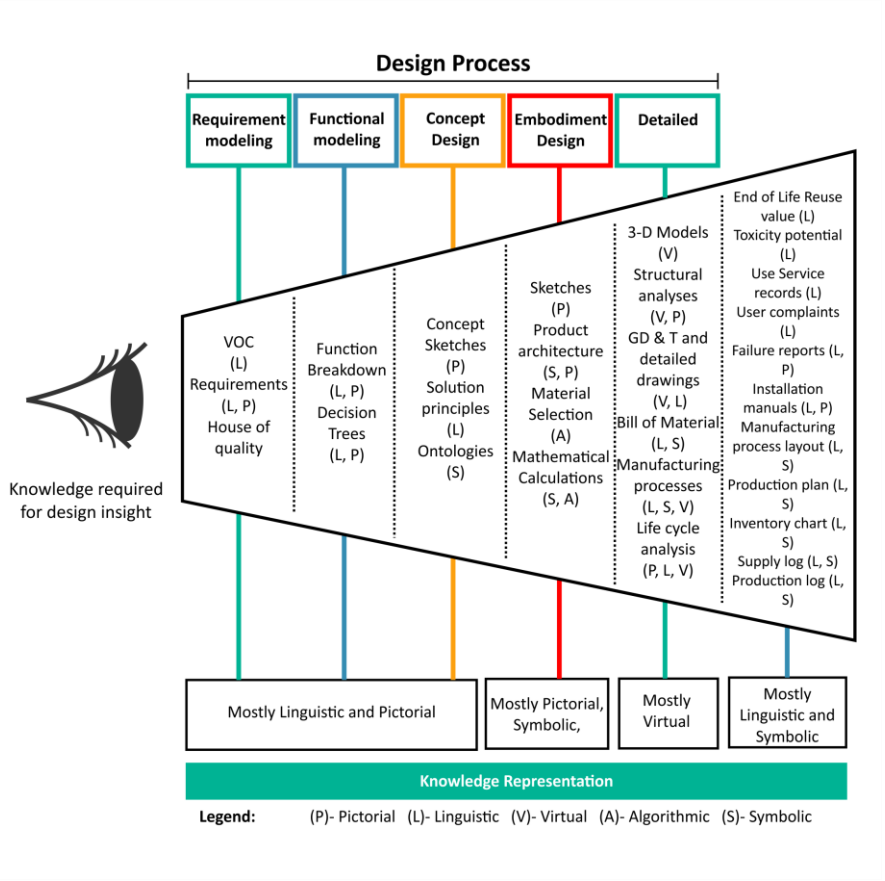

Figure 2.4: Knowledge transfer in Product design

Produced by: Author, 2018

Adapted from: Bernard et al., 2013:208

A summary of both design process phases can be seen in Table 2-1 , a comparative summary of the Product design processes presented.

Table 2-1: Comparative summary of the Product design process

Eppinger and Ulrich, 2012	**Bernard et al., 2013**
Planning	Requirement Modelling
Concept Development	Functional Modelling
System-Level Design	Concept Design
Detail Design	Embodiment Design
Testing and Refinement	Detailed Design
Production Ramp-Up	

Sources: (Bernard et. Al, 2013; Eppinger & Ulrich, 2012)

Collated by: (Author, 2018)

The generic process essentially starts with the creation of a wide set of concepts which are then narrowed and refined as product specifications are decided upon. It could also be thought of as a risk management system with various risks being identified and prioritized throughout the design process which refines the final product outcome (Massay et al., 2001:576). The design process concludes once all the information required to support the production and sales of a product have been created and successfully communicated (Eppinger & Ulrich, 2012:13).

Within the Product design process there are numerous internal relationships that influence the outcome of the product. These relationships exist not only between the design team members but include cross-functional relations such as the Administrative employees and Manufacturing members. Each employee has their own unique set of inputs and desired outputs from the process (Eppinger & Ulrich, 2012:3). It is crucial that the Product design process is well collaborated, especially when it comes to transdisciplinary teams with complex systems. It therefore becomes imperative to manage the effective communication of product knowledge and subsequently the representation of the knowledge among the different teams and functions, which becomes a challenge (Bernard et al., 2013:208).

2.2.4 Challenges faced in the Product design industry

There are a number of challenges faced in the Product design industry. These challenges range from (1) the immense pressures to deliver to (2) the planning and managing of processes both internally and externally to result in (3) the successful transfer of knowledge within transdisciplinary functions (Bjeirmi & Munns, 1996:81; Bernard et al., 2013:204).

There is an exorbitant amount of pressure on designers in terms of demands for a faster turnaround time, lower margin for error, efficiency in managing cross-function employees involved throughout the design process. As well as the growing need to collaborate in multi-disciplinary teams (de Vere, Kapoor & Melles, 2010:33).

The economic success of most Product design organizations strongly depends on their ability to accurately identify the needs of customers and efficiently create products that meet these needs at a relatively low cost. In order to achieve this it is not merely a design problem, nor is it a marketing or manufacturing problem, it is a collective of all these functions and their ability to function together (Eppinger & Ulrich, 2012:2).

It is important that multiple projects are well coordinated within a business in order to achieve the desired product outcome (Bitner et al., 2007:5). When a project fails, more often than not, it is as a result of a simple miscommunication between employees and functions within the design process. These miscommunications lead to larger implications on the greater service experience. This is not surprising as there is a vast amount of cumulative information and knowledge that needs to be considered and managed (Browning & Danilovic, 2007:302). As Product design is a transdisciplinary service, the employees involved have different approaches and perspective on the means of executing their function in design, they also have a vast range of experience, knowledge and overall understanding. This creates obstacles and challenges when collaborating on a single product (Kim & Lee, 2010:1795; Browning & Danilovic, 2007:301).

2.3 The shift in value: from tangible products to experiences, services and service experiences

At the close of the 20th century and the start of the 21st, the field of design saw several new fields emerging as a result of the rapid developments in technology. These developments changed the role of design in organizational life (Julier & Moor, 2009:157). It was identified that companies such as Goodyear and Bridgestone moved from predominantly selling products to selling an array of services. The product is still integral to the service but the value to the customer now lies within the service offering. The core value proposition thus shifts from product, in this example tyres, to service solutions and customer experiences (Sherwin, 2012:16). This has led to a growing emphasis for service-based businesses to design meaningful, memorable and beneficial customer experiences (Bitner et al., 2007:2). It is through these superior customer experiences that businesses now gain their competitive advantage in the market (de Belgeonne et al., 2017:32). This view is shared by Gentile, Noci and Spiller (2007:395) who explain that experience plays an increasingly significant role in the success of a service offering.

Before the topics of service experience, customer experience and employee experience are further explored it is important to understand the underlying link and relationship between these experiences. As evident in Figure 2.5, the overall service experience consists of the customer experience, employee experiences and any mechanism that influences these experiences such as touchpoints, processes, the service setting and the end product (Business Dictionary, 2018). Therefore providing a superior product only partially fulfils the optimal service experience. The graphic also indicates how any changes to either of these entities, good or bad, would have an impact on the associated experiences as well as the overall service experience.

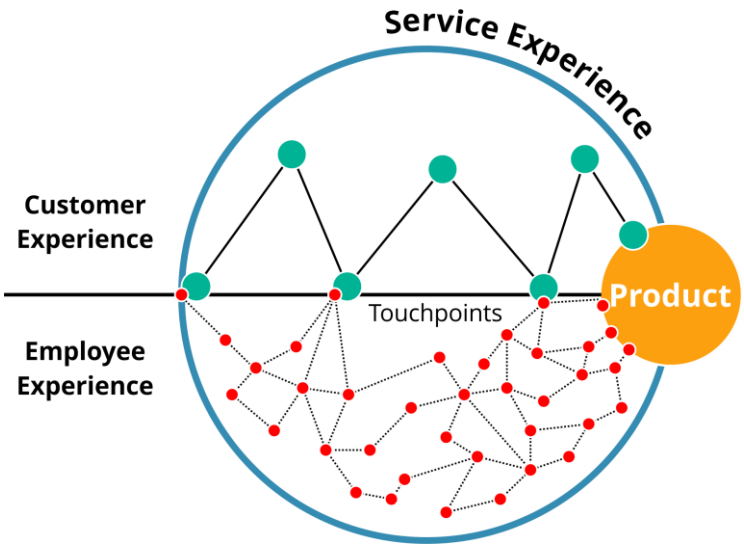

Figure 2.5: Service experience breakdown

Produced by: Author, 2018

2.3.1 The key to optimising service experiences

It is said that the secret to a good experience does not lie in the multiplicity of features on offer. Instead, Meyer and Schwager compare Microsoft Windows and Apple products to demonstrate this statement (2007:2). They explain that many users prefer the operating system offered by Apple, which offers fewer features and configuration options. They add that, beyond the features, the key difference between the two businesses is the experiences they offer their customers.

A customers experience with an Apple device for example, begins well before its purchase. Meyer and Schwager (2007:3) explain that the key to Apples superior service experience lies in the consistent and coherent experiences offered throughout the customer journey, from pre-service to post-service experiences. These experiences include the elegant and sleek advertisements as well as Apple's unique product packaging. Apple packaging shows a significant attention to detail behind material choices and the "unravelling" process of the product. The authors conclude that "every Apple product is designed with the overarching purpose of making the time one spends with Apple an enjoyable experience." Thus coherent and consistent service experiences are key to the successful implementation of a superior service (Arroniz, Sawhney & Wolcott, 2006:79).

Duncan, Jones and Rawson (2013), mentioned a case where a national television service provider in the United Kingdom encountered challenges in providing a comprehensive and coherent service experience. This had led to dissatisfied customers and frustrated employees. They explained that the service provider had the common challenge where functions within the business were operating

independent of one another which resulted in inconsistencies within the service. Duncan, Jones and Rawson (2013:6) explain that the root causes of poor customer experiences, more often than not, stem from inside a business and is predominantly caused as a result of cross-functional disconnects.

The researchers' approach to the challenge was to embed customer journeys across all the functions of the service provider. These maps helped to identify where the service needed to improve, assisted in a mutual understanding of how they are currently performing and also provided a tool to continuously support the experiences for the customers and the employees. The mapping also allowed the various functions and employees the insight they needed to understand the complexities in their working environment and the implications of their actions on the overall service experience. The functions now had more empathy for their counterparts in other functions of the business and could now brainstorm solutions collectively and insightfully. The end result was a co-designed process that was four times as efficient, significantly more satisfying to the customers and much better aligned with the business' vision and mission (Duncan, Jones & Rawson 2013:7).

These two reported case studies indicate the significance of creating coherent service experiences and the implications caused from a lack thereof. In order to compete in the experience territory it has been found that a number of businesses are employing various principles and tools towards designing for customer experiences. It is believed that designing for superior customer experiences would drive customer loyalty. In addition to this, creating a meaningful service experience unique to a particular business makes it incredibly challenging, and near impossible, for competitors to replicate (Berry, Carbone & Haeckel, 2002:5).

It can be noted that a significant opportunity to create superior services as a competitive advantage lies in the touchpoints (any time a customer comes into contact with the service provider) between a service and its customers. However, it is important to note that not all touchpoints are equivalent in the value they offer customers (Meyer & Schwager, 2007:3).

2.3.2 The challenging, yet imperative, role of customer experience

Businesses are realising that they cannot solely rely on providing superior value through their physical products, but instead need to create long term relationships with their customers (Bitner et al., 2007:2; Arroniz, Sawhney & Wolcott, 2006:77). The customer is at the core of any experience with a business and therefore as businesses shift their focus from products to their services it is crucial to place more attention on the customer experience a business offers (Thoelen & Cleeren (eds.), 2015:27). According to Meyer and Schwager (2007:2), a customer experience is defined as

“the internal and subjective response customers have to any direct or indirect contact with a company.” It is this “subjective response” from customers that makes designing for superior customer services so challenging.

Designers traditionally focus inwards, meaning they put most, if not all, of their time, effort and attention into the final deliverables for their customer. It is assumed that this is enough to satisfy the customer’s needs, but recent studies have proven that this no longer guarantees customer satisfaction (Sherwin, 2012:8).

Customer dissatisfaction is a common issue in services. It has become increasingly challenging due to customers’ empowerment and highly influential role in the success of a business, this dissatisfaction has become increasingly dangerous for services (Meyer & Schwager, 2007:11). In order to avoid dissatisfied customer experiences in the design industry it is necessary for processes to be more collaborative. There also needs to be extensive internal and external communication and coordination amongst all those involved within the design process (Bernard et al., 2013:205; Sherwin, 2012:8).

It is advised that there should be more focused design efforts towards customer interaction and touchpoints whenever a designer or design-business comes into contact with a customer or potential customer (Sherwin, 2012:8). The customers experience with a service plays a fundamental role in determining a customer’s preference and subsequently their purchase decisions (Gentile et al., 2007:396). It is explained that any communication with the customer has a significant influence on their satisfaction levels. For example, if a customer has an urgent question or query, a speedy and precise response will satisfy and reassure the customer much more than a slow, half-hearted response ever will. It is not only important to ensure that communication is precise and efficient but it should also be frequent and of high quality as this helps to create a high perception of value for the service (Sherwin, 2012:10). In contrast to this, Duncan, Rawson and Jones’ study on customer satisfaction (2013) found that giving customers too much information led to confusion and further customer dissatisfaction. It was also found that customers expressed frustration during key moments in a service offering, even if operationally, everything was as it should be and there were no hassles. The main challenge in addressing customer communication is therefore seen as subjectivity; as there are various factors that influence each customer’s experience.

A major contributing factor of customer experiences is customer expectation management. Every time a customer comes into contact with a business the gap between their expectation and their

actual experience is the difference between customer satisfaction and customer dissatisfaction (Meyer & Schwager, 2007:3). This relationship is illustrated in Figure 2.6.

Figure 2.6: Relationship between customer expectation and experience

Produced by: Author, 2018

Customer's expectations are set through various factors; sometimes based on previous experiences with the general service, shaped by the market and competitors or simply the points of contact (touchpoints) between the business and the customer over time (Meyer and Schwager, 2007:3). Therefore it is important for businesses to not only meet but exceed expectations in order to create satisfactory customer experiences. Meyer and Schwager (2007:10) conclude that:

> Customer experience does not improve until it becomes the top priority and a company's work processes, systems and structure change to reflect that.

Thus, if businesses want to improve the experiences they offer their customers the business needs to prioritise and invest conscious amounts of time and effort into assessing and designing their customer experiences.

2.3.3 The importance of enhancing employee experiences

Since most components in a service offering are intangible the core value of the service lies in the employees knowledge and skills. By association this means that the service's future prospects depend heavily on its employees and the perception of quality in interactions between the customer and the service provider (Chi & Gursoy, 2009:246). Therefore it can be stated that in order for businesses to gain competitive advantage they need to provide superior experiences to their employees (de Belgeonne et al., 2017:32).

A number of successful businesses and businessmen, including Sir Richard Branson (founder of Virgin Enterprises), have reportedly accredited the satisfaction of their employees as key to their business achievements. Belgeonne, Jaatinen and Vaajakallio (2017:32) explain that:

> In a business environment where competitive advantage is gained through producing superior customer experiences and innovating new solutions that answer and predict customers' needs, the employees of a company are its most crucial asset.

It is because of bold statements such as these that employee experience has received significant attention from researchers and businesses in the past two decades (Chi & Gursoy, 2009:245). Therefore, when designing a service it is essential to understand not only the customers of the service but more importantly to understand and design for the employees that deliver the service to customers (Leon, 2014:20).

In order to provide effective front- and back- stage employee experiences, especially in an environment that is constantly changing and unpredictable. Research strongly suggests that businesses need to support their employees. This support would help employees cope with the rapidly changing environment and support their ability to enjoy their work and what they do (de Belgeonne et al., 2017:33). Providing employees with a desirable working environment leads to satisfied employees who are both loyal to the business and provide customers with a superior service experience (Chi & Gursoy, 2009:245). Customers recognise and value an outstanding service which in turn leads to customer loyalty and retention (Gentile et al., 2007:396).

Employees may not be aware but, through their gestures, comments and actions they portray a message to the customer that shapes their experience with the service (Berry et al., 2002:1). Once the functions of a business are aware of the significance of the service experience they can better understand their role and impact on the success of the experience (Meyer & Schwager, 2007:10).

2.3.4 The relationship between experiences and financial performance

It has been proven that it is beneficial for businesses to focus on the experiences they offer their customers and employees throughout their service offering. To support this, studies have found a direct link between customer satisfaction and financial performance of a business. It has also been proven that there is a direct relationship between customer satisfaction and employee satisfaction, even though it is not currently proven which has the biggest impact on the other (Chi & Gursoy, 2009:252). This relationship and potential outcomes can be seen in the adapted Figure 2.7.

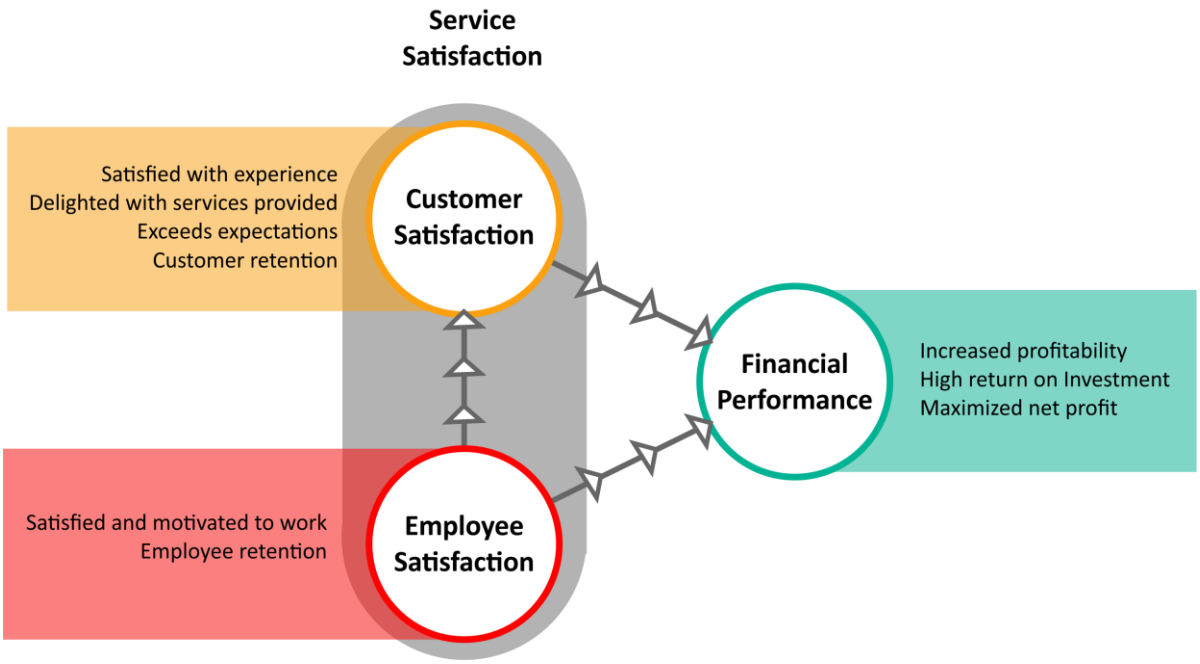

Figure 2.7: Relationship between customer satisfaction, employee experience and financial performance

Produced by: Author, 2018

Adopted from: Chi & Gursoy, 2009:246

It is these types of studies that have led to businesses placing an increased and conscious focus on both their employee- and customer- experiences. Instead of focusing on which one may have the biggest impact on the other businesses that are able to successfully manage their entire service experience "reap enormous rewards: enhanced customer satisfaction, reduced churn, increased revenue, and greater employee satisfaction" (Duncan et al., 2013:4).

Businesses with top customer experience have independently recognised the link between their customer experiences and their employee experiences. It was found that these companies produce up to 80% higher return on investment compared to their competitors who put less focus on their customers and employee experiences (de Belgeonne et al., 2017:32). These impressive figures are

further validated by a recent article released by *Forbes*. This recent article indicated that businesses that invest in enhancing employee experiences were four times more profitable than the businesses that did not (Forbes, 2018).

It is said that in order for a service to operate effectively for both the customer and the employee, the entire sequence of activities that support each function should be co-ordinated and managed as a whole entity. The service also needs to focus on its resources and the steps that generate value for the customer as this has been proven to lead to long term value for the business (Bitner et al., 2007:3). For services to fully leverage experience as a part of their value proposition to the customer they need to manage the emotional component of the experiences they offer (Berry et al., 2002:2).

It is inevitable that customers will always have an experience with any interaction they encounter. Whether this is good, bad or an indifferent experience it has an impact on the customer's preferences as well as their purchase decision towards a service (Gentile et al., 2007:395). The key is for businesses to use customer experiences as an opportunity to gain customer loyalty and retention (Berry et al., 2002:5). Unless businesses acknowledge the subjectivity in experiences and the role that every employee and function plays in shaping them, customer satisfaction is more of a slogan than an attainable goal (Meyer & Schwager, 2007:11). In order to succeed, a business has to continuously improve their ability to create satisfactory experiences for both employees and customers more so than its competitors (Chi & Gursoy, 2009:245).

2.4 The design behind services

Services are all around us in many forms from telecommunications to retail through to finance and healthcare. Similarly to the term product, the definition of a *service* can be viewed from various perspectives. From a human-centred view, services are described as "process- and experience-based, which strongly relies on interpersonal delivery systems to deliver value to an end user." (Bitner et al., 2007:2). It is explained that a service occurs over a varying period of time and consists of multiple interactions between people, information, products and spaces (Davies & Wilson, 2015:4).

2.4.1 Growth in the service industry

The end of the 20th century saw the emergence of a society and economy based upon knowledge, experience and services (Brand Flu et al., 2016:2; Miettinen & Valtonen, 2012:90). This resulted in a significant yet sustained growth within the field of services on a global scale. Ultimately the world, as we know it, is becoming characterized by numerous services (Bitner et al., 2010:4).

Currently the world's most advanced economies are dominated by the service industry. The majority of these economies have more than 70% of their GDP generated through services, with this sector projected to grow even more in the future (Brand Flu et al., 2016:2; Ostrom et al., 2010:4; Julier & Moor, 2009:160). Services are described as advantageous as they have the unique ability to add an additional benefit of supporting customers in order to get the best result from a product and thus driving long term customer loyalty (Brand Flu et al., 2016:2). Some businesses embrace this growth in services and see it as an opportunity while others see it as an obstacle in their respective business context (Brand Flu et al., 2016:4).

For example, large companies such as General Electric, IBM and SAP, who started as predominantly product-based companies, identified and embraced the growth in services. By capitalising on this opportunity, these companies are currently receiving larger revenues from their services than from their products (Julier & Moor, 2009:160).

2.4.2 Basic complexities in the service industry

Although described in very simple terms, *services* are highly diverse in terms of where they occur, the level of skill and organizational complexities involved in delivering them and the extent to which they are experienced by the customer to add value (Julier & Moor, 2009:160). There have been two fundamental complexities that have been identified. Firstly, transdisciplinary communication and secondly, the intangible features of a service.

Services, particularly in the modern world, are complex in nature and often rely on various disciplines working coherently with various levels of interactions and processes (Ostrom et al.,2010:4). The collaboration of people from varying professions is a challenge in itself as each stakeholder has their own expertise, jargon and role within the service. This makes the inter-relations and cross-functional communication challenging to manage (Stickdorn & Schneider, 2011:50).

The second fundamental and seemingly obvious challenge is that services are intangible. This makes it difficult for employees to understand their role and the engagement with the customer in the service. This gap in understanding makes it more challenging to address or improve the service from a holistic point of view (Julier & Moor, 2009:164). It is important for all employees and functions of a business to be aligned on the common goal of creating an integrated and memorable customer experience (Bitner et al.2007:4). This will improve the customer's perception of the service and ensure customer loyalty and retention which will have a positive impact on the service as a whole (Gentile et al., 2007:396).

It can be deducted that in

complete understanding is the main contributor to these complexities. Either in the form of miscommunication across disciplines and functions or as a lack of understanding of one's role and responsibility in the service offering. With an industry filled with intangible features where communication is a key challenge, how can the lack of understanding in services be addressed?

2.4.3 The exciting new relevance in the role of design

In the past, experiences within a service were "consequential not intentional" with services and associated experiences being "silently" designed by employees, who were more often than not unaware of their impact on the customer and service experience (Julier & Moor (eds.), 2009:160, 161; Leon, 2014:19). In the past, designers had played a subsidiary role in the design of services. This resulted in the customer experience being a consequence of the products, internal processes and individual skills of the employees and not intentionally designed or focused on (Leon, 2014:19).

Customers' expectations have "radically changed" over the past two decades (Sankey, 2014:22). Owing to well-designed products and services such as Google maps, Amazon and iPhones customers expect things to be easy to use, and as such understand good design, even if they cannot articulate it. As customer expectations increase there is a greater need to understand customer needs (Brand-Flu et al., 2016:3). With customers increased expectations and the shift of value to create superior customer experiences it is evident that there is a need and opportunity for design intervention.

Now design is more than just a source of competitive edge. It is fundamental and can now make or break a business, create new realities and play a key role in helping tackle profound global challenges (Sankey, 2014:23). Never has design had such an important and powerful role to play (Leon, 2014:19). We live in a service-based economy that requires constant innovation. It is this eminent need for service innovation that saw the birth of several new disciplines, one of which, commonly referred to as Service design (Manhaes, 2013:24).

2.4.4 The emergence of Service design

Service design is a design field that is quickly becoming a formally established practice and theory (Julier & Moor (eds.), 2009:159). Over the past few decades, the Service design community has developed frameworks, methods, tools and terminology specifically aimed at understanding and improving services (Mager, 2013:62). Service designers form a strong community that create service solutions that are useful, usable, desirable, efficient, effective and different (ibid). The process of

designing services allows one to 'manage complexity' as part of the process, and create both value propositions and holistic brand experiences (Sankey, 2014:22).

Service design means engaging at a systems and component level (Leon, 2014:18). In order to create a meaningful impact it requires designers to possess a deeper and broader set of skills and knowledge. It also requires designers to have the capacity to shape strategies, not only in the form of physical artefacts in touchpoints but also in workflow. The value of Service design is related to a systematic change in perspective: from being rooted in data to identifying opportunities through a clearer understanding (Mager, 2013:64). Service design allows one to delve deeply and think broadly. It enables understanding through visualisation and creates innovation based on interdisciplinary co-creation (ibid).

It is important that multiple projects in design are well coordinated within a business in order to achieve the desired product outcome (Bitner et al., 2007:5). When a project fails, more often than not, it is as a result of a simple miscommunication between stakeholders within the design process which has larger implications on the rest of the process. This is not surprising as there is a vast amount of accumulative information and knowledge that needs to be considered and managed (Browning & Danilovic, 2007:302). As Product design is a transdisciplinary service, the stakeholders involved have different approaches and means of executing their function in design, they also have variations in experience, knowledge and overall understanding. This creates obstacles and challenges when collaborating on a single product as a team (Kim & Lee, 2010:1795; Browning & Danilovic, 2007:301).

As services are intangible, variable and delivered over a time and space, people often resort to using verbal communication to describe and specify them which often results in oversimplification and an incomplete understanding (Bitner et al., 2007:4). A means to represent services and their subsequent activities, relationships and interdependencies is therefore required in a clear and concise manner that is structured but flexible enough to be adapted (Bitner et al., 2007:5; Browning & Danilovic, 2007:301).

2.4.5 Service design methods: tools to support understanding

Service design is recognised for its effective and beneficial tools and methods of visualisation. This is commonly seen in the form of various established mapping techniques.

Service design uses mapping as a form of sense making. More specifically in the form of translation, collecting data and transforming it into a visual format (Bitner et al., 2007:5). Maps play a significant role in shaping projects as they are used to represent various forms of complexity within a service (Vizard, 2017:50). They are visual tools that make use of a designer's ability to synthesise and resemble information and other intangibles (ibid).

Service design maps are also used as a tool for understanding complex experiences and processes. An often-encountered challenge for Service designers is determining which map type best suits a particular project (Liefhebber, Lu & Overkamp, 2017:64). This is a challenge because Service design has developed numerous mapping tools and techniques that have been tested and proven to hold significant value. These maps range from customer journey maps to experience maps, personas and service blueprints to name but a few, each with their own purpose and value. With so many mapping options designers need to define the map best suited for the project based on the purpose of the mapping exercise (Liefhebber et al., 2017:64). It is found that the Service design approach and techniques are increasingly being adopted by other design disciplines such as Interaction design, Experience design and Product design (Sankey, 2014:24).

In summary, Service design maps are useful and carry significant value to employees, functions, customers and service providers (Liefhebber et al., 2017:65). Mapping constitutes a fundamental role in the value of Service design. Multiple sources of literature state and prove the array of benefits that Service design maps offer. Table 2.2 summarizes the numerous benefits of mapping and respective mapping tools and techniques.

Table 2-2: Summary of mapping benefits

Benefit	Description	Mapping Tools and Techniques
(1) Understand the customer	A map can be used to empathise with the customer and better understand their daily context (Brand Flu et al., 2016:55)	Service safaris Shadowing Customer journey maps Personas
(2) Compare customers	A map can be used to compare customers in order to determine unique value propositions based on customer types (Liefhebber et al.,2017:65).	Service safaris Shadowing Personas
(3) Emphasise customer importance	A map encourages service providers to consider the customer and subsequently become more aware of the customers perception (Brand Flu et al., 2016:70).	Stakeholder maps Customer journey maps Personas Service blueprint
(4) Facilitate discussion and brainstorming	Maps are a useful basis for discussions as they provide a comprehensive, structured and visual representation of a service (Liefhebber et al., 2017:65).	Stakeholder maps Service safaris Customer journey maps Expectation maps Storyboards Service blueprint

Benefit	Description	Mapping Tools and Techniques
(5) Align understanding	Through co-creating maps the participants gain a shared understanding and full insight into a service (Vizard, 2017:50).	Stakeholder maps Customer journey maps Personas Storyboards Service blueprint
(6) Understand current customer experiences	A map of current customer experiences yields significant insights for the service moving forward to cater for and improve customer experiences (Liefhebber et al., 2017:65).	Service safaris Shadowing Customer journey maps Personas Storyboards Service blueprint
(7) Identify opportunities and priorities	Mapping provides a view of a service that assists in identifying opportunities for where the experiences within a service can be enhanced. These opportunities can then be prioritised (Vizard, 2017:50).	Stakeholder maps Service safaris Customer journey maps Expectation maps Personas Storyboards Service blueprint
(8) Determine the ideal customer experience	A map depicting the ideal customer experience will help businesses work towards making the ideal a reality (Vizard, 2017:50).	Customer journey maps Expectation maps Personas Storyboards
(9) Evaluate design	Maps can be used to evaluate the effectiveness or efficiency of a possible design (Brand Flu et al., 2016:70).	Stakeholder maps Customer journey maps Storyboards Service blueprint
(10) Manage customer expectations	A map can be used to communicate to customers what they can expect from a service. This would provide reassurance and could potentially appeal to prospective customers (Liefhebber et al., 2017:65).	Customer journey maps Expectation maps Personas Service blueprint

Collated by: Author, 2018

Maps may be used to achieve any of the above mentioned benefits but Liefhebber, Lu and Overkamp (2017:68) emphasise that a map should be a living artefact after it has been created. Maps should be updated and referred to during the design process and used as an input for design steps to follow (ibid).

Visualisation allows individuals to map complex situations and creates an overview of all the parts and relationships in between them (Brand Flu et al., 2016:10). Maps, diagrams, and system drawings enable various teams to understand situations significantly better, gain a shared focus, and bring clarity to possibly confusing information. Visualisation helps people think and communicate. In the information-rich environments of business, access to knowledge is rarely the main challenge. What consumes time, effort, and brainpower is making ideas simple and understandable (ibid).

Therefore Service design mapping tools and techniques offer a substantial benefit to address intangible complexities in a service riddled with “unseen” challenges.

2.5 Conclusion

It is eminently clear that the field of Product design is riddled with various complexities and pressures. This review elaborated on the Product design context such as who is involved and how it is offered as a service. It also explored the shift in value proposition, the new role and relevance for design’s role and the emergence of Service design discipline.

The objective of this literature review was to gain a full understanding and insight into the transdisciplinary service of Product design and briefly address how Service design tools, such as mapping techniques, can benefit it. It is evident that there is significant value and benefit in generating a consolidated visual representation of a complex service. These benefits would have a positive impact on employees, customers and the service as a whole.

Employees would gain a better understanding of their complex working environment. They would have a clearer understanding of their role and responsibility in the service offering. This greater understanding could lead to a greater appreciation or compliance with processes within the service. An increased focus on customers’ needs means their needs could be catered for more accurately and improved customer experiences could lead to customer loyalty towards the service.

The service as a whole would have a better understanding of their processes and its impact on customers and employees. Employees can now be supported through clearer understanding of their demanding working environment. Services can also effectively identify and address challenges, whether externally with the customer or internally between employees or functions. Services are also enabled to actively design and enhance their processes and interactions to optimise experiences.

Literature has proven that increased employee experiences leads to employee satisfaction and retention. It has also stated that increased customer experiences lead to satisfied customers, this drives customer loyalty and retention. These will contribute significantly to an overall superior service experience which will in turn result in improved financial performance.

3 CHAPTER THREE: METHODOLOGY

3.1 Research methodology: Case study

A case study research strategy is advised when there is need for exploration or detailed understanding of complex issues, particularly within real world contexts (Beaumont & Davies, 2011:1; Zainal, 2007:1). As this research aims to ultimately map the current complexities in Product design as a transdisciplinary service it is essential that there is an in-depth understanding of the context. Therefore a case study methodology is deemed most suitable.

Case study methods enable a researcher to gather, through an actor's perspective, through both quantitative and qualitative data. It also helps to explain both the process and the outcome through complete observation and analysis (Yin, 2012:11; Zainal, 2007:1). One of the key advantages of case studies as a research methodology, is the vast variety of sources and avenues it offers for data collection. This ranges from direct observations to interviews, physical artefacts and documents; making it flexible to gather and collect data (Zucker, 2009:2). This essentially means that there are multiple sources of evidence to validate interpretations and avoid bias in the research (Yin, 2012:10).

Once the process of Product design as a service is better understood, identifying and exploring issues or challenges within the service would be possible. This means that recommendations and interventions could be formulated from a more informed and insightful perspective. With this potential outcome in mind, this research utilised a descriptive case study methodology in order to be as detailed about the present-day service processes and interactions as possible. Zainal (2007:3) explains that a descriptive case study sets out to describe the natural phenomena which occur within the focused data.

Case studies have, however, been labelled as being challenging to conduct with prolonged durations and producing vast amounts of documentation (Zainal, 2007:5). In order to avoid these challenges, this research was investigated for a predetermined period of time, co-created with relevant stakeholders of the service and guided by the research methods used. The research design featured carefully constructed methods of data collection and a conceptual lens for analysis.

The first step required the researcher to concisely define the "case" for the study; whereby a "case" is typically defined as a bounded entity (Yin, 2012: 6). In clearly defining the area of focus there is more structure and limitations to the research. The case for this research is Skeg Product

Development[4], a well-established Product design organization located in Cape Town, South Africa. Skeg prides itself in the capability of taking any design from ideation through to full manufacture all under one roof. Skeg has over 25 years of industry experience and has in the past year alone designed and manufactured products ranging from a beer bottle prototype to a tactical patrol boat. This design-business consists of various professionals: including Mechanical and Electrical engineers, Industrial designers, Prototype experts, as well as Administrative roles such as procurement and finance. The wide array of professions involved in the process of Product development at Skeg, makes it an ideal context for investigating 'transdisciplinary product design as a service'.

This could be seen as a disadvantage, as the findings cannot be generalised on a broader level (Yin, 2012:6; Zainal, 2007:5). In addition to this, single case studies are seen as less certain or confident in their findings in comparison to multiple case studies (Yin, 2012:9). This study however, aims to propose a foundational understanding of Product design as a service in practice, which can inform further exploration in individual contexts. The research aim is not to establish the best practice of Product design as a service, but instead illustrates the complexities and inter-dependencies of Product design as a service.

Case studies as a methodology are a creative alternative to traditional approaches; their real value lies within the findings it generates and the emphasis it places on communication and relationships (Zucker, 2009:14). When considering the given parameters and research aims, the use of a single descriptive case study best suited the desired outcomes of this study.

3.2 Research methods

The research methods employed in this study were reviewed against the noted advantages and disadvantages of the single case study research methodology. The methods were selected as they facilitated the most accurate and unbiased collection of data. It needs to be acknowledged that visualising qualitative data from a case study lends itself to potential bias. In order to avoid this, stakeholders were involved throughout the data collection process with findings evaluated and validated through the participants.

[4] For more information regarding Skeg Product Development and their processes please visit their website at www.skeg.com

3.2.1 Direct observations through field notes

According to Yin (2012:11), direct observations are one of the most distinctive features in employing case study research and adds that the conventional means of collecting and recording direct observations within a context is done using one's own senses. Frequently the best technique is using field notes to create a narrative based on the five senses experienced. Mechanical devices such as voice recorders and cameras aid in this process (Durrheim, Terre Blanche & Painter, 2011:307).

Direct observations were recorded using field notes and through the use of other mechanical devices such as a *Livescribe* pen recording device and photographic evidence, this ensured that recording observations remained as unbiased as possible throughout the study. Observations were sporadic and included all natural occurrences within the case study, this meant up to 26 employees were subject to observation over the duration of the study.

3.2.2 Unstructured interviews (contextual)

Unstructured interviews do not use a set of predetermined questions but instead maintain a flexible approach (Milton & Rodgers, 2013: 92). Unstructured interviews are often conducted when the interviewer is not as well informed about a particular topic as the interviewee, and therefore requires the interviewee to identify and explain topics in greater depth of understanding (Merriam, 2009:91). As stakeholders within the Product design service are more informed about the context in which they operate on a daily basis, it was important to allow them to expand on specific topics for discussion.

A contextual interview is an interview conducted within the environment in which an activity of interest and enquiry occurs (Schneider & Stickdorn, 2011:162). The significance of this allows the interviewer to observe and probe natural behaviour within the context and allows the interviewee to remember particular details about a process they may have otherwise overlooked, it also makes the interviewee feel more comfortable, as they are in a familiar environment (Durrheim et al., 2011:15). This method proved most useful when the researcher approached specific stakeholders about particular sub-processes they are involved in.

Zucker (2009:6) explains that in conducting unstructured interviews within a case study context, it is important that questions are broad and loosely structured. She added that the questions, although broad, should remain focused on the intent of the research. Questions were therefore open-ended but concise and strictly focused on the practice of Product design and the particular sub-process in question. Yin (2012:12) adds that the insights gained from unstructured interviews can be more

valuable if the participants are key persons within the case study context. The interviews conducted in this study had thus been between various stakeholders within the case study but more specifically focused on, but not limited to, those involved in the managerial roles for the delivery of the service such as the general manager, project managers and project coordinator. Once the mapping became more specific, all relevant stakeholders were involved to give detail and to validate the findings. A total of three informal interviews were conducted during this study; namely with COO-W02 on 26 April, ADM on 5 May and with PM-W01 on 9 May.

Unstructured interviews within case studies commonly occur on multiple occasions and can include more than one participant. The flexible format of case studies permit the use of unstructured interviews, if conducted correctly, it may result in a real-world narrative from varying perspectives (Yin, 2012:12). This research made use of unstructured interviews in various forms, both in an uncontrolled environment, such as in passing conversation within the confines of Skeg, and within a more structured context; such as a co-design workshop.

3.2.3 Co-design workshops

Co-design is a core philosophy of service design, therefore a combination of service design mapping tools and co-design was used in this study (Schneider & Stickdorn, 2011:198). The UK Design Council defines co-design as:

> A community centred methodology that designers use to enable people who will be served by a design outcome to participate in designing solutions to their problems. (Coupe, Cruickshank & Hennessy, 2010:49)

When researchers employ co-design as a method to facilitate a workshop or meeting with participants, there is the possibility that participants struggle to represent or express their ideas visually. It is therefore necessary for the researcher to prepare techniques to guide these participants in an interesting, innovative and open manner (Coupe, Cruickshank & Hennessy, 2010:49). The participants of the workshops included the researcher and specific key stakeholders within Skeg with the primary purpose to map the existing internal processes of offering Product design as a transdisciplinary service.

As this research was conducted within a context with a strong design backbone, visualisation and representation was not perceived to be a major challenge or concern. However, in other research instances there have been strategies developed to allow participants to identify points in their own setting of use by providing them with relevant tools (Johansson, Kristensson & Matthing, 2008:487).

Therefore, the use of service design tools aided and supported the visualisation process in all the workshops that were conducted. This study conducted three co-design workshops facilitated by various Service design tools and techniques. A summary of these workshops and respective tools used can be seen in Table 3.1 below.

Table 3-1: Breakdown of Co-design workshops conducted in study

Co-design workshop	**Service design tools and techniques used**	**Participants** (Total no.)
Workshop 1: Delineation	(Ideal) Customer Journey	CEO-W01 PM-W01 PC-W01 ID-W01 EN-W01 (5)
Workshop 2: Customer to front of stage	(Existing) Customer Journey Service Blueprint	CEO-W01 COO-W02 PM-W01 PM-W02 (4)
Workshop 3: Backstage Service Blueprint	Service Blueprint	CEO-W01 COO-W02 PM-W01 PM-W02 (4)
Workshop 4: Collaborative analysis and evaluation of findings	Analysis and open discussion	CEO-W01 COO-W02 PM-W01 PM-W02 ID-W01 EN-W01 (6)

Collated by: Author, 2018

It must also be noted that Service design has various established tools for generating a tangible representation of a service from various perspectives and in varying levels of detail (Thoelen & Cleeren (Eds), 2015:38). The customer journey and service blueprints were identified as containing the most value to this study.

3.2.4 Customer journey map

A customer journey describes the steps that customers go through when using a service (Brand-Flu, Lovlie & Reason, 2016:167). A customer journey map provides a general but well-structured representation of a service's user experience (Schneider & Stickdorn, 2011:158). These maps are used to view customers' experiences on a more granular level, in order to focus on a specific aspect of the service and how it is portrayed (Brand-Flu et al., 2016:167). A customer journey map is important as it offers the customer's perspective of a service and helps identify interactions or points

of contact between the service provider and the customer, also known as a touchpoint (Sneider & Stickdorn, 2011:159). The amount of detail and description that goes into a customer journey map varies based on its intended purpose. A basic example of a customer journey map can be seen in Figure 3.1.

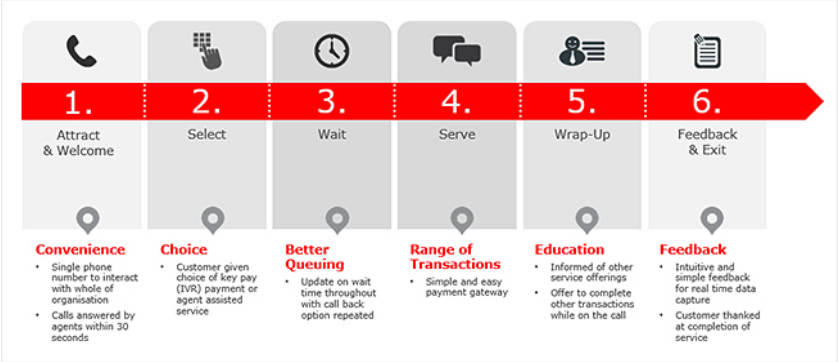

Figure 3.1: Example of Customer Journey Map

Image from: Inside Story Knowledge Management 2017. *Customer Journey Mapping.* Inside Story. [Online]. Available: http://insidestory.com.au/products-services/create-and-learn-insight/customer-journey-mapping/ .(1 November 2017).

A customer journey map was utilised in both the first and second co-design workshops of the mapping process; initially to identify an ideal Skeg customer journey and later as the starting point for the service blueprint mapping, explored in greater detail in Chapter Four.

3.2.5 Service blueprint

A service blueprint is a detailed visual representation of the total service over time which maps the customer's journey and subsequent touchpoints and avenues, as well as behind the scene interactions within the service organisation (Davies & Wilson, 2015:19). Service blueprints allow all individuals in an organisation to visualise an entire service and its underlying support processes which provides a common ground from which critical points of customer contact, physical evidence and other key influential experience cues can be orchestrated (Bitner et al., 2007:4). Potentially the biggest benefit of a service blueprint is the holistic view it offers as the end result (Davies & Wilson, 2015:19).

A service blueprint of the selected focus area and subsequent processes was compiled in collaboration with relevant stakeholders involved within that process to verify that the data recorded is valid. As seen in Figure 3-2, a service blueprint is more structured than a customer journey, but builds on the outcome of a customer journey mapping to exploit the processes involved in the customer's experience. 'Attendee actions', in the graphic presented, refers to the customer journey.

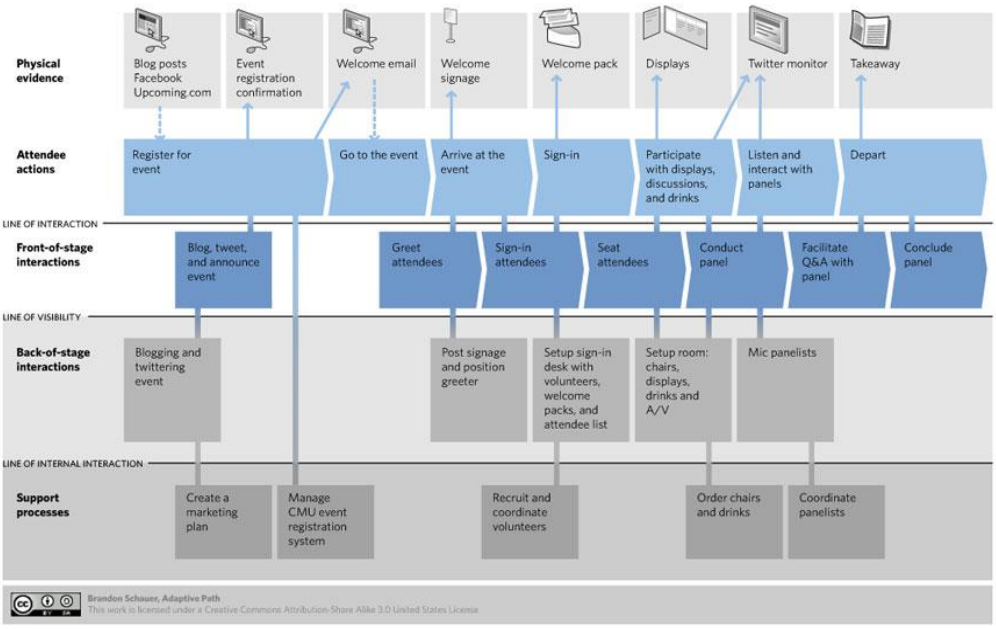

Figure 3.2: Service Blueprint mapping

Image from: The Toolkit Project 2017. *Service Blueprint Canvas*. The Toolkit Project. [Online]. Available: **http://thetoolkitproject.com/tool/service-blueprint-canvas#sthash.mmY0AzPm.dpbs** .(1 November 2017).

3.3 Research participants

As previously mentioned, this research made use of Skeg Product Development as a single case study. It was important to include participants for the case study that were from various functions of the business to ensure that the mapped outcomes were derived from as many perspectives as possible. The participants varied from those with managerial roles, to design and administrative employees. Workshop 1 involved the CEO, a Project manager, the Projects coordinator, an Industrial design employee and an Engineering employee. Workshop 2 and 3 involved inputs from participants that are actively involved in the mapped process on a regular basis. This included the CEO (Chief Executive Officer) and head of Business development, the COO (Chief Operations Officer) and all the Project managers of the business. Informal interviews were conducted with the COO, an Administrative employee and one of the Project managers. The collaborative analysis workshop (Workshop 4) involved all participants that were involved in the data collection process. While observations of the case study were continuous and were not limited to specific employees or functions of the business.

3.4 Sampling (data collection)

Sampling involved careful consideration and is vital to the study as the sample selected represents the specific collection that the research is targeted towards (Durrheim et al. 2011:49). This ensured that the best possible understanding and representation of the real world complexities within Product design could be mapped. Stakeholders were only included if they are involved in the focused process and sub-process of the service mapping.

Participants were approached by the researcher directly in order to inquire whether they would be interested in partaking in the study. If participants had any questions pertaining to the research they were sent a document breakdown of the study (seen as Appendix A). Once all the participants had given their verbal consent, a meeting time and location was scheduled and sent to participants to indicate their availability. Before the workshops could commence the researcher presented the workshop objectives and participants were asked to sign consent forms should they wish to continue in the study.

3.5 Conceptual framework: Service design

In simple terms, Service design is “about making the services we use more usable, easy and desirable” (Davies & Wilson, 2015:4). Service design requires an understanding of the customer outcome as well as the internal organisational process. This includes the way in which a customer experiences a service over time through various stakeholders, interactions and touchpoints (Bitner et al., 2007:4). The core principles and foundation of Service design proved to be a valuable lens for this study. As indicated in Figure 3-3; it is user-centred, co-creative, sequencing, evidencing and holistic (Schneider & Stickdorn, 2011:34).

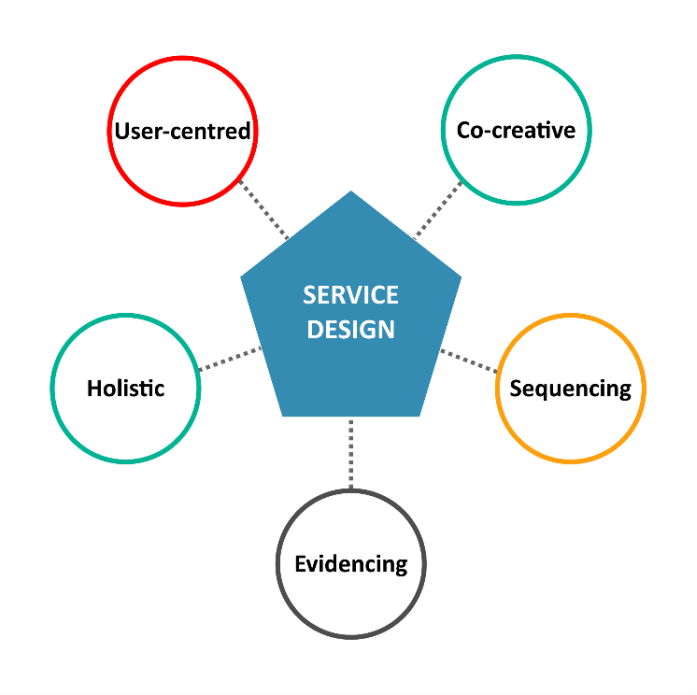

Figure 3.3: Service design key principles

Produced by: Author, 2018

Adopted from: Thoelen & Cleeren, 2015:12

Service design is first and foremost used to design services that meet the needs and requirements of the users and stakeholders of the service, it is therefore user-centred (Thoelen & Cleeren, 2015:12). The primary focus is that it is inclusive of all involved in the process of offering and experiencing a service both internally and externally (Schneider & Stickdorn, 2011:36). As this is the main focus, it is only fitting that in order to design services for users that the users themselves are involved in the process. Service design therefore encourages co-creation (Brand Flu, et. al, 2016:8). Service design encourages qualitative research methods and techniques such as interviews and observations in order to gain the valuable insights to support the designed service (Thoelen & Cleeren, 2015:12). As services need to cater for various potential users, as well as all the stakeholders of the service, it is important that they are involved in the design process as much as possible (Brand Flu et. al.,2016:11).

As services are intangible, it is necessary to make them physically evident by means of mapping representation that is easily understood for all. This has resulted in the development of a number of Service design mapping tools to represent different perspectives of the service (Brand Flu, et al., 2016:10; Julier & Moor (eds.), 2009:164). The mapping techniques of Service design are positioned

within the double diamond design process and encourage iterations to be constantly updated and adjusted based on user feedback (Davies & Wilson, 2015:7; Thoelen & Cleeren, 2015:13).

A service rarely ever consists of one single interaction; predominantly services include a sequence of interactions that result in a customer journey (Schneider & Stickdorn, 2011:40). This means that each phase of the service is viewed as important, as evident in the use of Service design tools such as customer journey maps and service blueprints, which focus on the service sequentially as opposed to being independent of one another (Thoelen & Cleeren, 2015:12).

And finally, Service design is holistic. It constantly views a service in its entirety (Thoelen & Cleeren, 2015:13). Although it may focus on aspects of the service, it remains focused on the service as a whole from all aspects (Schneider & Stickdorn, 2011:44).

Service design was a useful lens for this research as it has a strong focus on all stakeholders involved in the service, whether experiencing it externally or offering it internally. This includes all the functions within the organization as well as the customer. Service design is known to ensure efficiency by streamlining the processes of a service, removing unnecessary elements as well as reduce costs (Thoelen & Cleeren, 2015:19). Although Service design presents numerous desirable benefits for its use as a conceptual lens, it is necessary to acknowledge some challenges it may pose to the research.

The use of Service design as a conceptual framework ensured that the research maintained a holistic stance on service as an entity. It remained focused and centred around the users, both internal and external to the design-business, it also encouraged co-creation and the involvement of the users within the research process. And ultimately Service design was aimed towards the improvement of services through evidencing and mapping the intangible accurately.

Service design was identified as the most viable and most suitable framing for the mapping of the experiences explored in this study. The challenges were identified and addressed in the collection and representation of the data, it is seen that the benefits of a well-structured mapping far out-weighs the challenges of the potential unfamiliarity challenge. Design is a term that is difficult to define, it is therefore a challenge to understand what exactly it means, who is involved and why it is necessary. The well-structured mapping that Service design offered had the benefit of demystifying and crystallising the process and allowed stakeholders to address important topics that emerged.

3.6 Thematic analysis

Thematic analysis, also referred to as TA, originated from a physicist and historian of science named Gerald Holton in the 1970's (Braun & Clarke, 2014:6626). Besides being a well-established means of analysis it has also been applied across many fields and disciplines (Durepos, Mills & Wiebe (eds.), 2010:926). According to the Encyclopaedia of Case Study Research, Thematic Analysis is a "meaning-making process" that, over time, has been proven to be particularly successful for methodologies most notably case studies. It is used tactfully to reduce and manage the often-large volumes of data generated through case study research (ibid).

Alhojailan (2012:40) explains that Thematic Analysis is considered the most appropriate means of data analysis for any study that aims for discovery and identification through interpretations. As the main objective of this research is to discover a process through stakeholder interpretation it was decided that TA would best suit this study.

Thematic analysis was originally used to merely describe or summarise key points and patterns within data sets (Aronson,1994:1). According to Braun and Clarke (2014) it is more than a means of reporting data as it allows for the effective interpretation of data to ensuring there is a relationship to a research question or topic (Braun & Clarke, 2014:6626). Thematic analysis is essentially a method used for identifying and interpreting patterns of meaning across qualitative data. (Braun & Clarke, 2014:6626). The most refined definition was found in the Encyclopaedia of Case Study Research, it added that besides being an approach to analysing qualitative data and identifying themes it also involves "… interpreting the resulting thematic structures by seeking commonalities, relationships and over-arching patterns" (Durepos et al., 2010:926).

This study acknowledges Aronson (1994) and Braun and Clarke's (2014) overarching steps to Thematic analysis as a guideline. Aronson explains the process of employing Thematic analysis occurs in three broad steps while Braun and Clarke express a more refined six step process, a summary of both views can be seen in Table 3-2.

Table 3-2: Summary of Thematic Analysis steps

Aronson (1994)	**Braun and Clarke (2014)**
Collect data	Familiarisation
Identify patterns	Generate initial codes
Combine and catalogue related patterns into sub-themes	Search for themes
	Review potential themes
	Define and name themes
	Produce the report

Collated by: Author, 2018

Aronson indicated that the first step is to collect the data and to ensure the data is as detailed and precise as possible (Aronson, 1994: 1). Braun and Clarke's first step, similarly to Aronson, involves becoming familiar with the data and identifying items of interest. It is important that the researcher learns the content by immersing themselves in their dataset (Braun & Clarke, 2014:6627). Historically it has been found that researchers collect data in the form of audio or video records which is later transferred into text to be analysed (Durepos et al., 2010:926) (Eppinger & Ulrich, 2012:39). For the purposes of this study, the researcher made use of a *Livescribe* recording device. This allowed the researcher to record the workshops without hindering the flow of conversation amongst the participants. The ability to have access to the workshop recording for direct referral later in the research process, ensured that reference could be made to the participants' actual comments, and not merely researcher notes and interpretation.

The next step in the Thematic analysis process involves systematically coding the data, this will help to identify potentially meaningful data points (Braun & Clarke, 2014:6627). The Encyclopaedia of Qualitative Research defines Thematic Analysis coding as "a process of closely inspecting text to look for recurrent themes, topics, or relationships, and marking similar passages with a code or label to categorise them for later retrieval…" (Durepos et al., 2010:926). The main purpose of coding in Thematic analysis is to make connections between differing parts of data collected (Alhojailan, 2012: 43). This phase ends with the collation of a list of codes and all data that is relevant to each code (Braun & Clarke, 2014:6627).

After collecting the data one identifies patterns, and subsequently the data that correlates to the patterns (Aronson, 1994:1). Similarly, Braun and Clarke's third step involves "searching for themes", it is explained that there is no ideal means to perform these phases and that researchers are left to develop their own means to identify patterns (Braun & Clarke, 2014:6627).

Once there is a set of data and patterns, it is necessary to combine and catalogue related topics into themes and sub-themes (Aronson, 1994:1). This approach will enhance the structure of the discussion around the findings. This is similar to Braun and Clarke's fourth and fifth step of reviewing and defining themes. This is done in two phases, firstly confirming that the themes are relevant to the coded data and, secondly, that they work in relation to the dataset as a whole (Braun & Clarke, 2014:6628). Researchers are encouraged to record and make use of their research questions and topics to ensure that the themes and topics remain relevant to their study (Durepos et al., 2010:926).

The sixth and final step in the Thematic Analysis process is to compile the report (Braun & Clarke, 2014:6628). The researcher's next steps involve reorganizing the themes and sub-themes according to priority and significance to the research topic and typed out in the Discussion Chapter in the necessary detail that is systematic, concise and logical.

Some criticise Thematic analysis for being too flexible, making it ambiguous and difficult to define (Durepos et al., 2010:927). Although this may be true, for the purposes of this study, and most qualitative research particularly in the design industry, the flexibility and adaptability is sought after.

In this project Thematic Analysis provided a flexible, foundational method to analyse qualitative data (Braun & Clarke, 2014:6629). It also ensured that the data remained contextually relevant and focused the interpretation (Durepos et al., 2010:926). The process yielded insightful and useful interpretations that are grounded contextually in the data (Durepos et al., 2010:927). The benefits of the analysis method therefore far outweigh the concerns, and proved appropriate for the purpose and outcome of this research topic.

3.7 Ethics

The main objective of ethical considerations within research, besides opposing any form of deception, is to ensure that people's rights are respected (Denzin & Lincoln (eds.) 2005: 145). It is the researcher's responsibility to ensure that ethical considerations are made whilst they conduct the relevant research (Babbie & Mouton, 2010:529).

To ensure all stakeholders were informed of the aims of the study, and the required input and access required, a breakdown of the study was presented to the case study participants, this document can be seen in Appendix A. The relevant stakeholders were given two weeks to review the document and raise any queries or questions they may have and were encouraged to approach the researcher with any concerns at any given time throughout the study. At this point the Chief Operations Officer of Skeg Product Development and owner of the company, signed and gave written consent to use Skeg as the single case study for this research project. This signed consent form can be seen in Appendix B.

The specific stakeholders within this study gave their written consent before actively participating and were continuously made aware of their contributions to the outcome of the study. They were also ensured that sensitivity was intact and privacy remained protected (Henning Smit & Van Rensburg, 2011:73).

An effective means of ensuring that the privacy of participants is protected is through coding participation. Coding data involves grouping participants and giving correlating codes to represent them as a sequence of letters or numbers instead of using personal names (Stead & Struwig, 2001: 169). Figure 3.4 indicates the mechanism used to code the participants involved in the study.

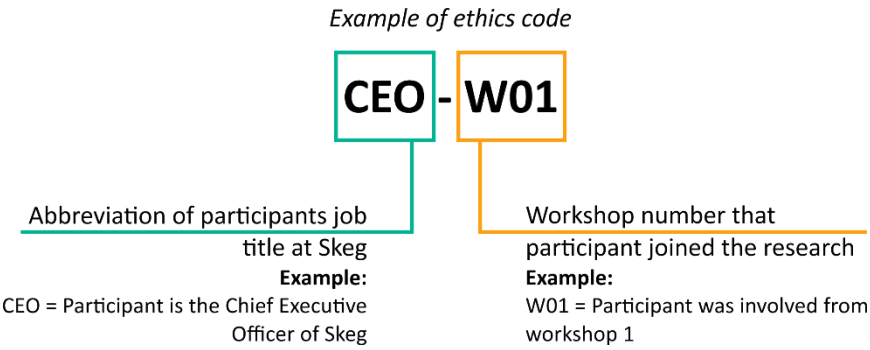

Figure 3.4: Coding Mechanism

Produced by: Author, 2018

In lieu of the graphic in Figure 3.4, participants were coded and profiled as per the tables below.

Table 3-3: Ethics coding and profiles

Ethics code	CEO-W01
Job title	Chief Executive Officer and Head of Business Development
Age	47 years old
Education	B.Eng (Mechanical), Stellenbosch University
Years of working experience	25 years
Years at Skeg	13 years

Ethics code	PM-W01
Job title	Project Manager for Manufacturing
Age	36 years old
Education	N.Dip (Three-dimensional design), Cape Peninsula University of Technology
Years of working experience	14 years
Years at Skeg	11 years

Ethics code	PC-W01
Job title	Projects Co-ordinator
Age	27 years old
Education	B.Eng (Industrial), Stellenbosch University
Years of working experience	3 years
Years at Skeg	3 years

Ethics code	EN-W01
Job title	Engineering Resource
Age	26 years old
Education	N.Dip (Mechatronics), Cape Peninsula University of Technology
Years of working experience	5 years
Years at Skeg	4 years

Ethics code	ID-W01
Job title	Industrial Design Resource
Age	26 years old
Education	B.Tech (Industrial Design), University of Johannesburg
Years of working experience	4 years
Years at Skeg	4 years

Ethics code	COO-W02
Job title	Chief Operations Officer and Project Manager
Age	42 years old
Education	MBA (2008), M.Eng Industrial (2003), B.Eng Industrial (2001), B.Sc Computer Science and Physics (1999)
Years of working experience	17 years
Years at Skeg	3 years

Ethics code	PM-W02-03
Job title	Project Manager
Age	40 years old
Education	N.Dip Industrial Design CPUT (2000)
Years of working experience	18 years
Years at Skeg	10 years

Ethics code	ADM
Job title	Administrative employee/receptionist
Age	47 years old
Education	Matric certificate (1990)
Years of working experience	30 years
Years at Skeg	3 years

Skeg Product Development was involved throughout the collection of data and has given consent to share the documented work as well as the maps that were generated within its context. It has been acknowledged that Skeg has its own intellectual property within its processes, which will not be disclosed in this study, as the main focus is on the current real world interactions and the transfer of knowledge and information offered in the service. Specific clients of Skeg and their products will also not be mentioned as it they are outside the scope of this study.

3.8 Delineation of research

Product design as a process is vast and in order to gain real insight it was necessary to delineate and focus the study on a particular area, and sub-processes within the Product design service. This also assisted in keeping the study focused and contained. The study aimed to be responsive to the needs and perceptions of participants and therefore the delineation of the study happened in collaboration with stakeholders.

The sheer nature of design is to want to resolve the issue when a friction point has been identified. It was critical to remember that the main objective of the study is not to offer a solution to a single challenge, but rather to map the core process as it is currently being delivered. Potential points of friction were highlighted as a result of the mapping. In order to ensure unbiased analysis of findings mapping exercises were iteratively completed, in collaboration with relevant stakeholders.

3.9 Schematic of research methodology

Co-design workshops formed the primary source of research with informal interviews and observations providing a supplementary role. These research methods were employed as per Figure 4.1 with observations occurring throughout.

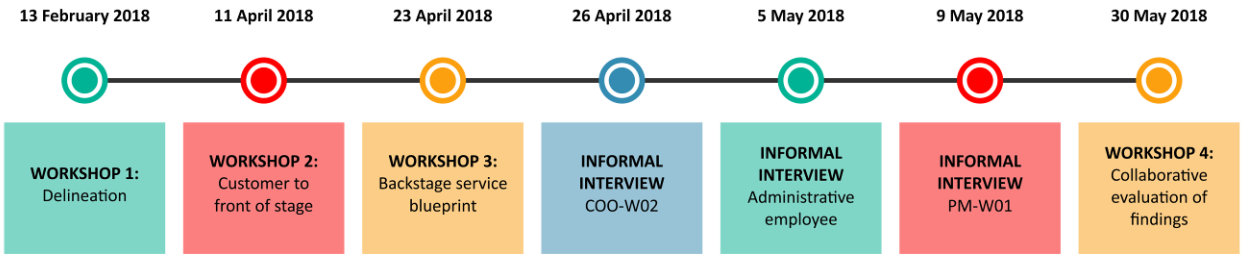

Figure 3.5: Schematic of research methodology

Produced by: Author, 2018

4 CHAPTER FOUR: FINDINGS

4.1 Introduction: Objective of the study

First and foremost, the objective of this study is to map the current real-world workings of Product design as a transdisciplinary service. Literature sources have revealed various complexities and challenges found within Product design as a service. This real world mapping is a means to support or contradict these findings, but beyond this it will provide clarity around the inner intricacies of a current Product design service.

Product design as a service is highly subjective, it varies from customer to customer and between various projects. It is therefore acknowledged that no single map will accurately represent a customer journey or service blueprint that is precisely what occurs with every customer or project.

4.2 Workshop 1: Delineation

The purpose of this workshop was to delineate and specify the focus of this study. It was decided to collaboratively delineate and focus the study as early in the process as possible. In order to maximize the benefit of the mapped outcome it was best to focus the study based on where a better understanding through visualisation would benefit the case study. This workshop used the basis of a customer journey map to create a comfortable and interactive platform for discussion amongst the participants. The workshop was structured in four basic steps as per the graphic (Figure 4.1).

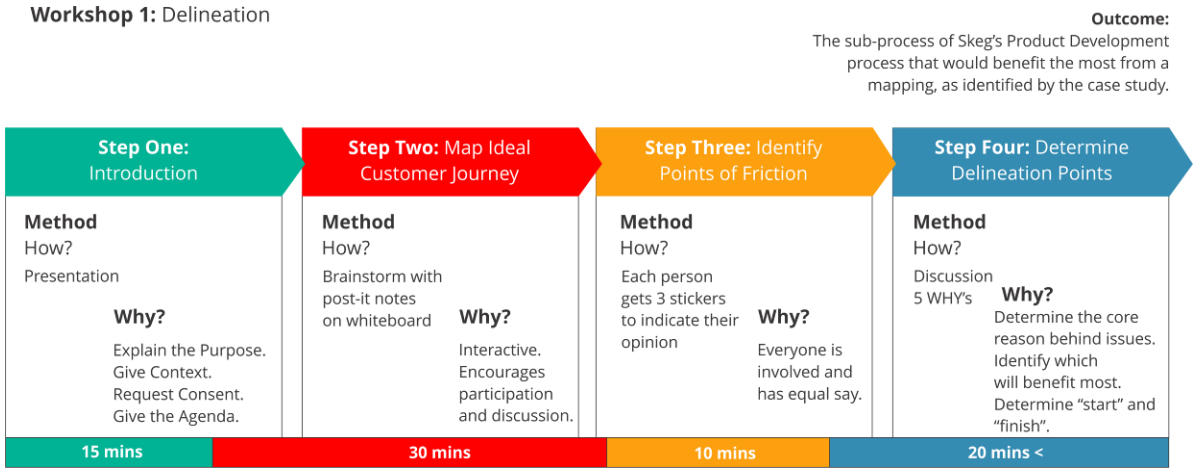

Figure 4.1: Breakdown of delineation workshop

Produced by: Author, 2018

4.2.1 Step one: Introduction presentation

Before the workshop commenced the facilitator explained that it was important to view this gathering as more of a shared, open discussion than a formal workshop. There was concern that the term “workshop” would influence the view and approach that the participants would have on the encounter.

The first ten minutes of the workshop involved a presentation conducted by the facilitator to give the participants a basic breakdown of the research focus and objectives of the study. This was to provide the participants with some perspective and a context into what their role is in the research. [5]

Before proceeding with the workshop, participants were asked if they had any questions and if they were satisfied to sign consent forms to partake in the study. This gave participants the option to withdraw should they feel so inclined. Once consent had been given the delineation process and desired outcomes were explained. The facilitator left the floor open for any questions or clarification that the participants required before continuing as per the agenda.

4.2.2 Step two: Map ideal customer journey

This mapping exercise made use of the room’s large whiteboard, markers and post-it notes. The starting point was defined by the facilitator as when a customer “finds out about Skeg”. It was explained that this could be through word of mouth or over the internet or by physically driving past the building. And ideally, as with any successful and thriving service, the customer would never leave after that point therefore there is no determined end. The end point is thus stated as “Customer never leaves Skeg”.

A line was drawn between the “start” and “end” points and the topic was left open for participants to put themselves in the shoes of their ideal customer. As suggestions were mentioned they were written down on post-it notes and added to the line on the board for all to see. As the process progressed post-it notes were added, adjusted and taken away freely and easily. This process continued until the participants were in agreement with the outcome.

[5] The Delineation workshop was recorded using a *Livescribe* recording device, this allowed the facilitator to focus on the progression of the workshop and document findings and outcomes once the workshop was complete. The presentation for Workshop 1: Delineation can be seen as Appendix C.

PC-W01 commenced the discussion by stating that the first ideal step after finding out about Skeg would be to “contact us”. This point was agreed upon by the other participants. ID-W01 and PM-W01 discussed the importance of gathering “good inputs” about a project in order to quote the customer accurately. The head of Business Development (and CEO) CEO-W01, explained that before that occurs, it is important that the customer should receive some form of feedback from their initial contact. This feedback would vary according to the subjectivity of their first point of contact. CEO-W01 mentioned sending an existing document, titled “Product development: according to us”, to the customer. He explained that this document explains what challenges the customer can expect within the Product design industry.

PM-W01 and PC-W01 agreed that the step following the customer providing their inputs and requirements would be to receive a quote or proposal for the required work. Shortly after this ID-W01 indicated that the step thereafter would involve the customer accepting the quote. CEO-W01 added “and pay”, to which the participants laughed. This helped to promote the casual nature of the discussion.

PC-W01 explained that internally the next step would be to load the project into the system pipeline and wait until there is capacity to launch the project. PM-W01 explained that the customer would ideally want to know the milestone dates and project plan, including when the project is expected to start. This is when CEO-W01 together with the PM-W01 agreed on and discussed the importance of “continuous feedback”.

EN-W01 explained that currently there is a false expectation that the project is released from the system and started immediately after the customer has paid their deposit. ID-W01 agreed to this observation. CEO-W01 explained that the customer is supposed to be notified on the status of their project regularly and receive constant feedback and news. He explains that:

> The customer is not so stressed about what the news is as long as the news matches their expectation (CEO-W01).

He added that the customer only expects their project to start immediately if they have not been informed otherwise. This initiated discussion amongst the group of participants who had different views on handling a customer’s expectation. At this point it was agreed that “manage expectations” was important to the ideal customer experience. EN-W01 added that throughout the project there should be a continuous loop of feedback and managing expectations. CEO-W01 agreed and added

that it is most important in this industry because the very nature of Product design is unpredictable. Therefore they are very necessary steps in order to keep the customer satisfied and well-informed.

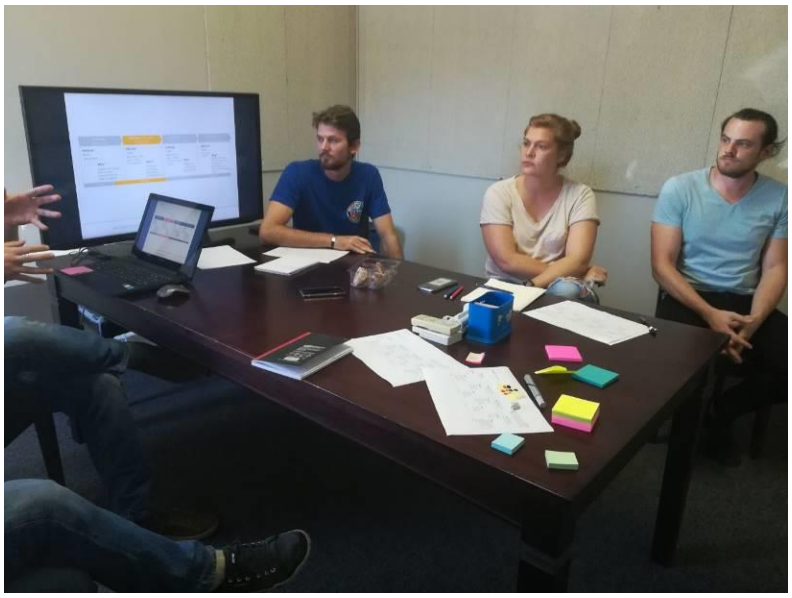

Figure 4.2: Participants discuss the importance of managing expectations

Image by: Author, 2018

4.2.3 Step three: Identify points of friction

Each participant was appointed 3 small stickers, one yellow, one red and one black. This is a familiar concept for the participants as Skeg uses green, yellow, red and black stickers to indicate the progress and time required to complete tasks of active projects within the business. The participants were asked individually where they would place their three stickers based on where they personally feel that Skeg is currently under-delivering or struggling to deliver. The black being their first choice (highest challenge), red their second choice and yellow being third choice in terms of priority. They were reminded that there is no right or wrong answer and to be honest with their opinion.

The facilitator started on one side of the room and asked each participant to indicate their choice for black, red and yellow. The outcomes can be seen summarised in Table 4.1.

Table 4-1: Summary of participant rating outcome

Participant ethics code	Job title	Black (3- Most challenging)	Red (2- Second most challenging)	Yellow (1- Third most challenging)
CEO-W01	CEO and Head of Business Development	Manage expectations	Receive quote/proposal	Continuous feedback
PM-W01	Project Manager and Head of Manufacturing	Provide good inputs	Receive quote/proposal	Accept quote and pay
PC-W01	Projects Co-ordinator	Manage expectations	Milestones	Provide good inputs
EN-W01	Mechatronics Engineer resource	Milestones	Product Development document	Manage expectations
ID-W01	Industrial Design resource	Milestones	Receives quote/proposal	Manage expectations

Collated by: Author, 2018

This process took roughly eight minutes in total. Once the rating process was completed there were some definite clusters of stickers but no obvious focus point. PM-W01 queried if the colours had a numerical value associated with them. This was not predetermined but resulted in a helpful suggestion to determine the highest rated challenges numerically. Subsequently the black dots were given a value of 3, the red 2 and the yellow 1. PC-W01, being the Engineer that he is, read out the totals per point. The rating outcomes can be seen in Figure 4.4 and Figure 4.5.

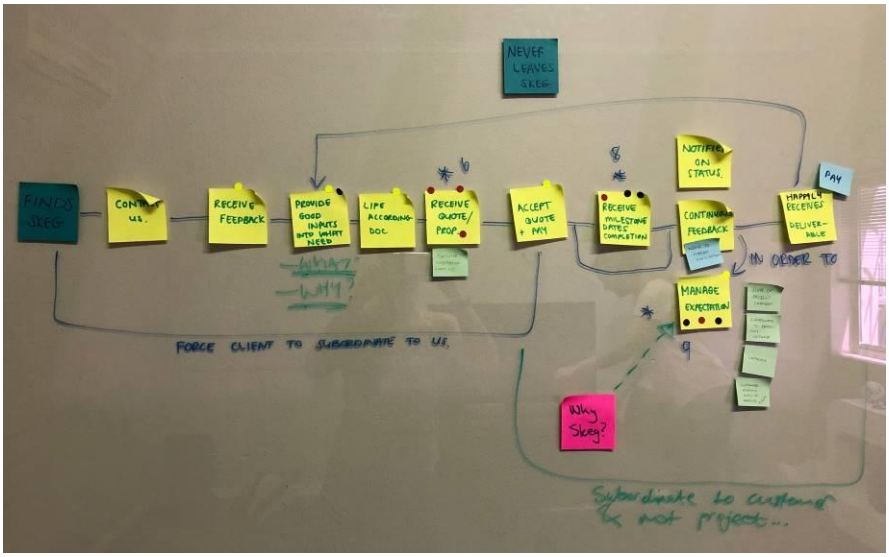

Figure 4.3: Photo of ideal user journey mapping

Image by: Author, 2018

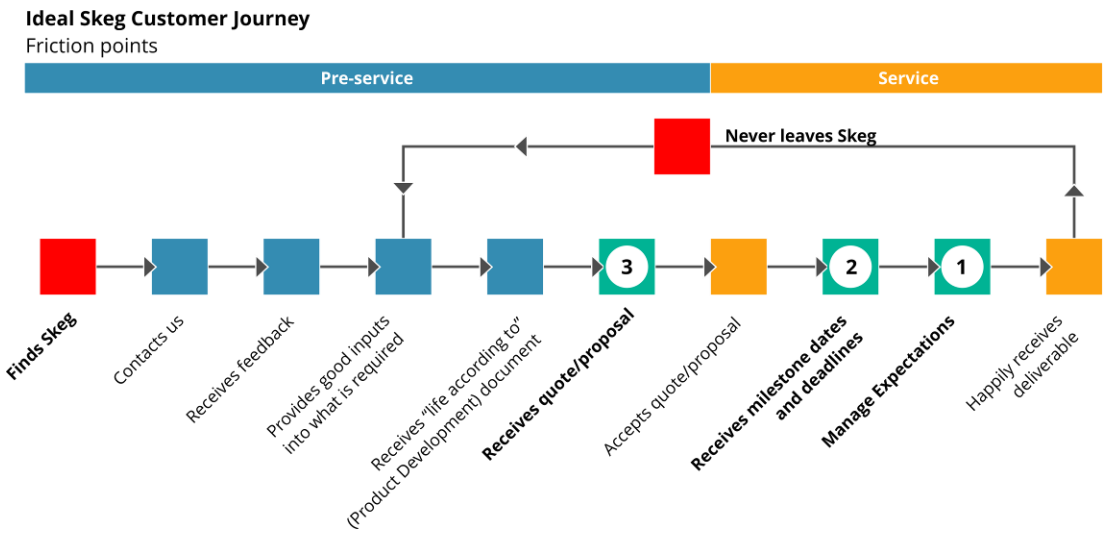

Figure 4.4: Graphic representation of ideal customer journey[6]

Produced by: Author, 2018

As indicated in figure 4.5, "managing expectation" is perceived by participants as the biggest challenge. It was interesting to note that "continuous feedback" and constant communication was not viewed as an issue. PC-W01 explained that the case study is good at communicating with customers but not necessarily managing their expectations. He explained that, although they are linked, there is a difference between "continuous feedback" and "managing expectations". He added that "you can send a customer a mail every week but that doesn't mean you are managing their expectations". CEO-W01 agrees and included that "you need one in order to have the other."

It was deduced from the discussion between participants that the customer's expectations are addressed relatively well up until the quote is signed by the customer. CEO-W01 explained that currently after the quote is signed and requirements are determined there is a definite shift in focus. He mentioned that initially decisions around the project are made by the Business development function based on what is best for the project. The shift occurs when the Operations function takes over this role and decisions are made based on keeping the customer satisfied. It is important to note that, owing to a customer's limited knowledge and experience in Product design, what the customer wants and what is best for the project are seldom aligned. PC-W01 explains that the conflict lies between doing what is best for the project but also keeping the customer happy which leads to the challenge of managing expectations. All participants agreed on this point.

[6] Skeg's ideal customer journey map can be viewed in greater detail as Appendix D.

Figure 4.5: Discussion about managing expectations between participants and facilitator

Image by: Author, 2018

4.2.4 Step four: Determine delineation (start and end points)

It is after this discussion that the start and end points for the process of "managing expectation" are determined. This ensured that the mapping would not exceed the scope of the study or fall stray of the purpose of the research. PM-W01 briefly explained that, currently there are numerous ways Skeg manages customer expectations along the customer journey. ID-W01 explained that customers are sent weekly emails containing fevercharts representing the progress of their project for that week. CEO-W01 added that one of the first means of managing customer expectations happens in the quote the customer receives. He explained that there is a description as well as payment schedule on the quote which also sets part of the expectation. EN-W01 added that when there are unforeseen challenges or big decisions that need to be made during the project there are also procedures that are employed. These procedures are aimed at managing the customer expectations through detailed discussions, either in a face to face meeting or over a phone call.

In summary customer expectations are currently managed in the following means:

- Quote/Proposal descriptions and details (Pre-service)
- Weekly emails, fevercharts and reports (Service)
- Exception driven communication (Service to Post-service)

This initiated a discussion within the group about the difference between “setting” expectations and “managing” expectations. It was agreed that everything leading up to the signed quote (pre-service activities) is “setting” expectations and interactions thereafter are “managing” expectations. Although it was debated and agreed that it is often necessary to adjust and reset customer expectations during a project.

It was therefore decided that the mapping will start with the case study receiving a signed quote from the customer up until the point when the customer is sent frequent updates regarding their project. The main focus will be put on the weekly emails, fevercharts and reports that are sent to the customer. As exception-driven communication is less routine and varies vastly from customer and project types, it was decided to not make this a strong focus point. The outcome delineation can be seen in Figure 4.7.

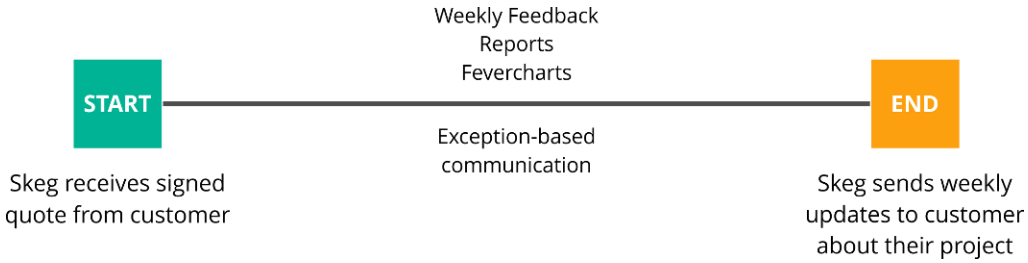

Figure 4.6: start and end point for mapping

Produced by: Author, 2018

4.2.5 Participant reflection

Participants were asked to reflect on their experience of the workshop in order for the facilitator to learn from short comings and build on victories for the workshops to come. It is important to reflect on the experiences in the workshop from both the facilitator and the participant's point of view. The feedback allows the study to be iterative in nature meaning it can continuously build on itself.

The participants were emailed independently and asked simple open-ended questions to allow for free expression. The general feedback was that the workshop had achieved its objective of being a casual setting for open discussion. All the participants expressed that they enjoyed the process and would happily partake in workshops to follow should they be requested to attend. [7]

EN-W01 acknowledged the effort and preparation that went into the workshop, most notably with the presentation and the agenda. He also noted that the process identified potential problem areas within Skeg as a result of the ideal user journey mapping. ID-W01 agreed with this stating that "the concept of analysing things properly I think helped with realising issues". She liked that the points of discussion could be discussed in a "neutral" and "constructive" manner.

PC-W01 shared his appreciation for the workshop saying:

> I thoroughly enjoyed the workshop. It was a great environment for comfortable discussion regarding our processes and interactions with customers.

He liked that it was open for everyone to share their view and opinion as "all opinions were welcome".

PM-W01 mentioned that:

> I felt involved. I got to see what other people in the organisation's perspective is on how our clients experience their journey with us.

He expressed that he enjoyed the opportunity to think from the viewpoint of the customer. He added that "the workshop made what we perceive our client issues are, visual and tangible".
He added that this helps to focus efforts to improve the customer experience.

[7] The email responses from the participants can be seen in greater detail as Appendix E.

EN-W01 explained that the only improvement he would suggest is to use more colloquial terminology as academic terms such as “delineation” are not familiar to him. PM-W01 made the suggestion to potentially build a journey map based on an existing customer to make the mapping less generic and more particular or context specific. ID-W01 explained that her only suggestion would be to give a better understanding of how the information gathered from the workshop will be used from that point on. That way the participants could have a bigger picture view of the study and their contribution. She also suggested involving more employees from the manufacturing function to participate as they would have a very different view and valuable input on the topics discussed.

4.2.6 Conclusion and next steps

Workshop 1 was a success in terms of achieving its desired outcome of delineating the focus for this study with definite start and end points. The participants involved in the workshop acknowledged that they felt the workshop was well-planned and they felt comfortable enough to discuss topics openly and freely. Although there were discussions that steered off topic, such as the current experiences at Skeg, however this is seen as a beneficial outcome to the workshop. It was also noted that there were clear moments in the workshop where the different backgrounds and experience became evident. The terms used by the different participants and participants requiring explanations for unfamiliar terms such as “decisive competitive edge”, a term that the Business development function uses regularly, but the Engineering employee required a definition. Participants expressed that the process helped to identify and address issues that may not have otherwise been discussed. The next steps included building on the points raised and feedback for Workshop 2: User journey with front of stage.

4.3 Workshop 2: User journey to front of stage

The purpose of this workshop was to map the existing interactions between a customer and the case study's front of stage staff. The front of stage staff include any employee that comes into direct contact with the customer. As determined in the delineation workshop (workshop 1) this mapping started when the customer sends a signed quote and ends when the customer receives weekly updates on their products from the Project managers. This workshop uses the basis of a customer journey map, familiar to participants from workshop 1, and a service blueprint map. More specifically the first two rows of a service blueprint map; customer actions and front of stage. Therefore it is important to note that this mapping only involves the customer to front of stage employees of the case study and excludes the internal interactions and processes. It is crucial that this mapping is as granular and as detailed as possible as it forms the foundation for the workshop to follow. Participants included the employees actively involved and subjected to the pre-determined process on a regular basis. This includes employees from the Operations function, the Business development function and Project managers. The workshop was structured in three basic steps as per Figure 4.7.

Figure 4.7: Breakdown of Workshop 2: User journey to front of stage

Produced by: Author, 2018

4.3.1 Step one: Introduction presentation

The first fifteen minutes of the workshop was dedicated to ensure all participants, whether involved in Workshop 1 or not, was on the same level of understanding of the objectives and desired outcomes of the discussion. This involved a presentation conducted by the facilitator recapping the basic breakdown of the study objectives and summarised the outcomes from Workshop 1. The presentation also included a light-weight breakdown and description of the term "service blueprint" as well as the value of this form of mapping.[8]

Before proceeding with the workshop the participants, not involved in the previous workshop, were asked if they had any questions and if they were satisfied to sign consent forms to partake in the study. This gave them the option to withdraw from the study should they feel so inclined.

COO-W02, a new participant to the study, required more information regarding the overall purpose and objective of the study as it was not clear to him whether the research would result in any solution-based outcomes. After explaining what was done in Workshop 1, CEO-W01 clarified that "We are not solving the problem just drilling down and mapping the current reality." He added that he believes this process will reveal the root causes to the problem and eventually lead to a point of realisation. He explained that PM-W02 had recently dealt with a frustrated customer caused by a misalignment in the front-end and back-end processes.

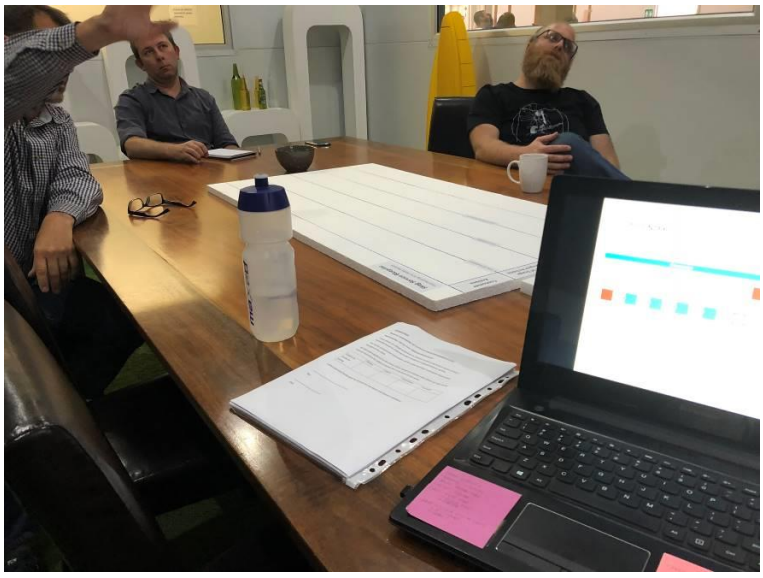

Figure 4.8: Participants discussion around the outcome from workshop 1

Image by: Author, 2018

[8] The presentation for Workshop 2 can be seen in Appendix F.

4.3.2 Step two: Detailed mapping of existing customer journey

The start point was defined by the facilitator as when a customer "Sends signed PO", where a "PO" (purchase order) is essentially a signed quote. CEO-W01 explained that the signed quote from the customer is received in various ways, sometimes it is sent to the Business development function or directly to the Finance function or alternatively communicated over a phone call or simply faxed. For the front of stage interaction it was mapped that the signed quote is received by either Business development or Finance, the method used is irrelevant to this mapping. At this point it was decided that the customer will be represented by a yellow pin, Finance would be represented by the green pins and Business development as the blue pins.

COO-W02 explained that after receiving a signed quote there is an acknowledgement email sent from the Operations function. At this point it was decided that Operations would be represented using a white pin. CEO-W01 explained that once the signed quote has been received there is currently a challenge as there is often a delay between the receipt of the signed quote and when the next Project manager becomes available to start working on the project. This is why it is necessary to have the Operations function acknowledge the signed quote. He explained that there are numerous interactions and processes that need to occur before the Project manager can make contact with the customer. The facilitator confirmed that these interactions are internal and do not involve the customer. This means they are backstage processes which is not relevant for the purposes of workshop 2.

PM-W01 indicated that this is where the line of communication ends with the customer until the Project manager is assigned. The Project manager contacts the customer directly to introduce themselves. Project managers are introduced to the mapping and are resembled by the red pins. COO-W02 explained that it is generally between the Operations introductory email and the Project manager's introduction email that "all hell breaks loose". COO-W02 explained that the Operations introductory email serves more as a confirmation of receipt and that the project will be loaded into the system and a Project manager will be in touch.

PM-W01 explained that often up until this point the Project manager was not involved in interactions with the customer. He added that it is therefore necessary to commence the project with a meeting with the customer to align requirements and gain a full understanding of expectations from the customer's point of view. COO-W02 and PM-W02 agreed to this point. "Detailed Project Discussion" was added to the map, this is either done in a physical meeting or telephonically as some customers are not based in Cape Town. CEO-W01 explained that as the Head of Business development he has

recently added an introductory meeting as a compulsory line item and first step in any project quoted on.

COO-W02 explained that after the "Detailed Project Discussion" customers can expect to receive weekly feedback from their respective Project manager. He explained that the "Detailed Project Discussion" is important as this is used as an opportunity for the customer to understand what is going to happen next and informs them about expected due dates. It is also important for the Project manager as this is their opportunity to align the expectations for the project. Figure 4.9 shows the map taking form through the discussions between the participants.

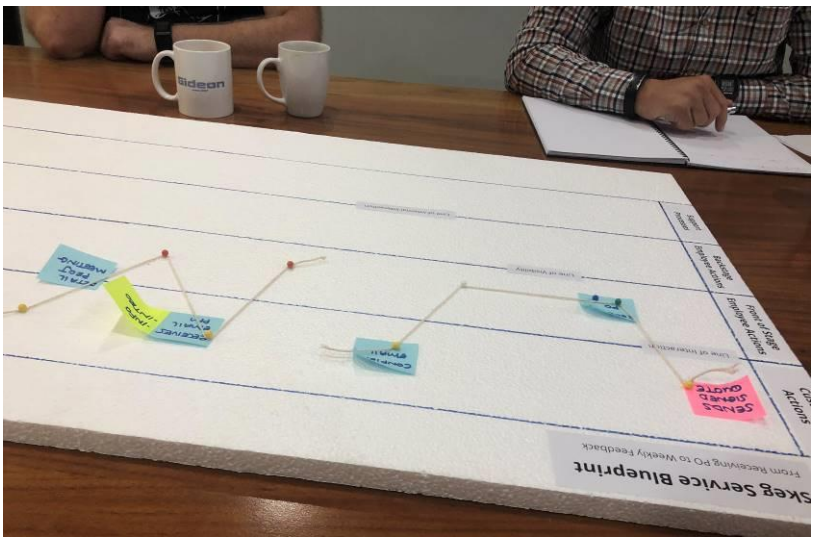

Figure 4.9: Mapping front of stage interactions

Image by: Author, 2018

PM-W01 explained that it is often necessary to schedule a follow up meeting with the customer during the project. This commonly only occurs if there is a big decision that requires attention or a "go or no go" point and forms part of exception-based interactions.

The Project managers discussed how some customers reply to their weekly feedback emails while others opt to not respond unless there is an issue or question. PM-W02 explained that weekly emails consist of fever charts and reports on "wins" or "losses" in the project. CEO-W01 added that this shows progress in the project in terms of work completion and budget used.

Towards the end of the mapping, COO-W02 explained that completing a project is a current challenge, especially for the Project managers. He added that the end of a project is when the real customer expectation crystallises. This sparked a discussion amongst the Project managers and COO about the challenges in the process both externally with the customer as well as internal issues. This led to a brief discussion about possible solutions to address said challenges.

PM-W01 indicated that the weekly email feedback to customers is crucial to managing the customer expectation. COO-W02 added that "expectation management is essential to keep customers coming back." COO-W02 then expressed that it would be interesting to use the mapping, once it is completed, to note what and where there are significant points of expectation management and define those points better. CEO-W01 added that it would be more fascinating to note the type of expectations such as timeline, technical or financial and which carries the greatest significance to the customer.

4.3.3 Step three: Walkthrough Journey

The mapped process was discussed point to point from when the customer sends the signed quote until the customer receives weekly feedback from the Project manager. The closing interactions were added for context and perspective. The weekly feedback continues until the project is complete and delivered to the customer. At this point the customer is invoiced by the Finance function for the work completed.

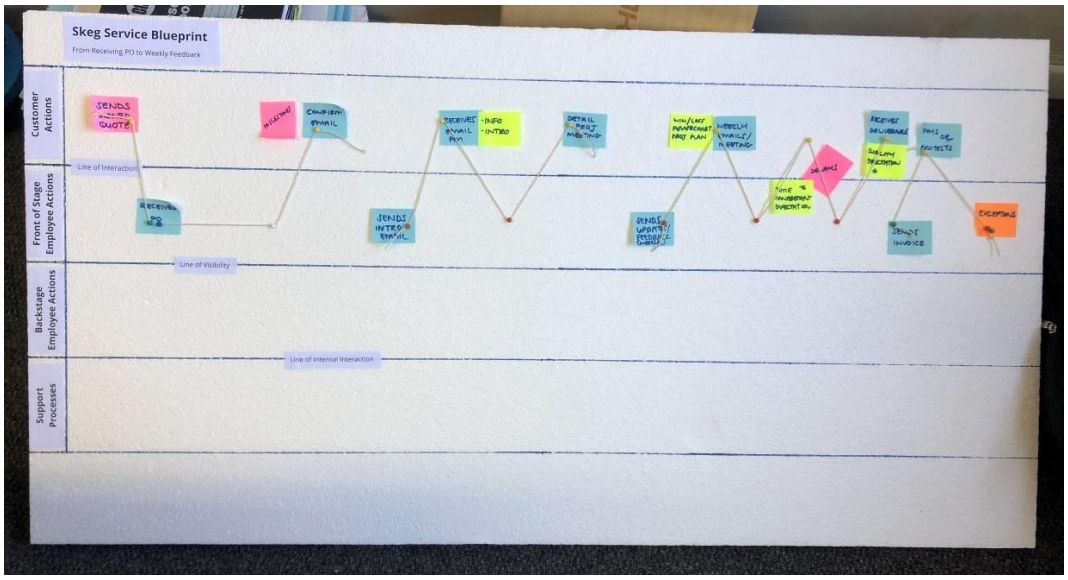

Figure 4.10: Mapped outcome from workshop 2

Image by: Author, 2018

Figure 4.10 shows the mapped outcome of the workshop. The multi-coloured pins each represent a stakeholder in the business. The string that connects pins represents the transfer of information and knowledge through an interaction, this could be in the form of an email, a phone call or a formal meeting. Figure 4.12 represents the mapped outcome in a clear and concise graphic.

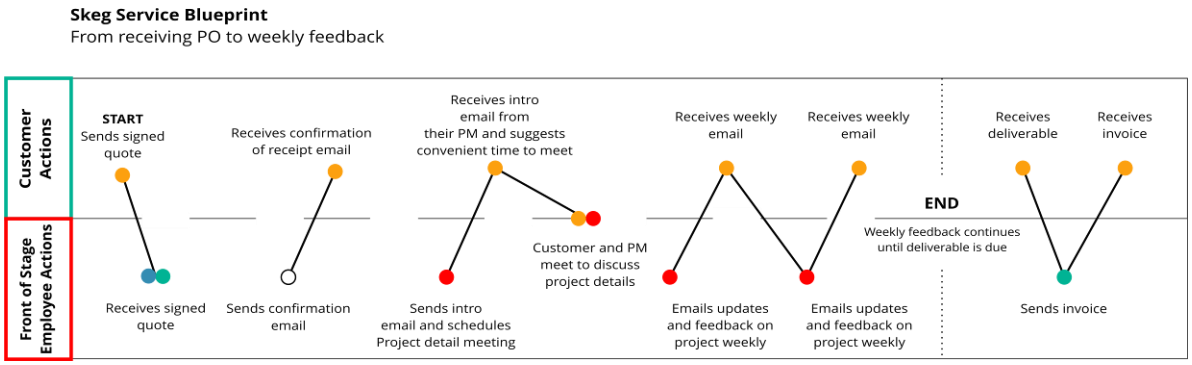

Figure 4.11: Graphic representation of mapped outcome from workshop 2[9]

Produced by: Author, 2018

It is interesting to note the number of various stakeholder functions that a customer comes into contact with, especially before their project is officially started and they are introduced to the Project manager. It is important to note that before sending the signed quote the customer has only had contact with the Business development function and in some instances the Administrative employee. It is also worthy to note the specific interactions that occur independently of one another and without a defined timeline between them. For example the time between the "confirmation email" sent by the Operations team and the "introductory email" sent by the Project manager could be hours, days or even weeks. The amount of weekly feedback emails sent depend on the duration of the project but will occur weekly until the customer receives their deliverable.

[9] The mapped outcome from workshop 2 can be seen in more detail as Appendix G.

4.3.4 Conclusion and next steps

Feedback from Workshop 1 was utilised and improved on in the planning for Workshop 2 effectively. The terminology was kept colloquial but still professional. The steps to follow were also discussed so that participants were aware of their contributions and the value they have on the bigger picture of the study.

Originally Workshop 2 and 3 were going to be conducted independent of one another. The final service blueprint outcome was not going to be mentioned to the participants of Workshop 2 but after the feedback from Workshop 1 it was decided that it was important to give participants the bigger picture of the process. This means the participants had a better understanding and their expectations were aligned to the goal of the research. This proved useful when it was necessary to explain the difference between front of stage interactions versus backstage interactions.

It was a challenge to keep participants focused only on the front of stage interactions as they kept reverting to backstage interactions that occur in between customer interactions. It was also challenging to remind participants that the focus of the workshop was to map the reality of the current process and not act as a problem solving exercise. The participants were found to discuss points irrelevant to the purpose of the workshop but this again was viewed as a strength to the study. For example, discussions regarding setting- and managing- customer expectations may not have been identified and addressed if it weren't for the mapping process.

Workshop 2 was productive and insightful for all involved, this includes the facilitator and all participants. This was supported when all participants asked to be involved in the next workshop. The workshop had accomplished what it had set out to achieve which was a concise mapping of the interactions between customers and Skeg's front of stage staff. A strong foundation was built for "Workshop 3: backstage service blueprinting" to expand on.

4.4 Workshop 3: Backstage service blueprinting

The purpose of this workshop was to map the existing backstage interactions between employees within the case study. It was most important to map the interactions that support the front of stage employees for their interaction with the customer. This workshop expanded on the mapped outcome from Workshop 2 by completing the service blueprint. The workshop focused on mapping the internal interactions and processes involved in the two lower rows in a service blueprint map; backstage and support processes. The same participants from Workshop 2 were involved in this phase of mapping. The workshop was structured in three basic steps as per Figure 4.12.

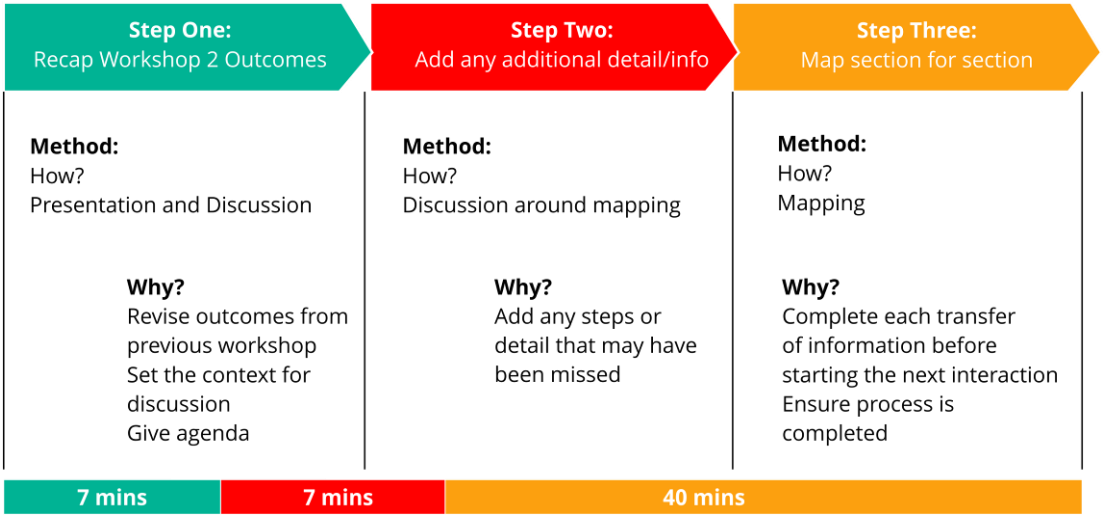

Figure 4.12: Breakdown of backstage service blueprinting

Produced by: Author, 2018

4.4.1 Step one and two: Recap workshop 2 outcomes and add additional details

The first seven minutes of the workshop was spent running through a presentation to remind participants of the objectives of the mapping as well as to recap the terms of a service blueprint. The outcomes of Workshop 2 (front of stage to customer interactions) were also discussed. COO-W02 required a more detailed explanation of the terms used in a service blueprint, most notably the difference between "Front of stage" and "Backstage". [10]

The following five minutes was spent carefully working through the mapped outcome from Workshop 2. This was to ensure that all participants agreed to the accuracy of the mapped interactions. This offered the opportunity to add further detail or potential missed steps if necessary. It also ensured that the process being mapped was fresh in participants' minds to build on and elaborate with the backstage processes.

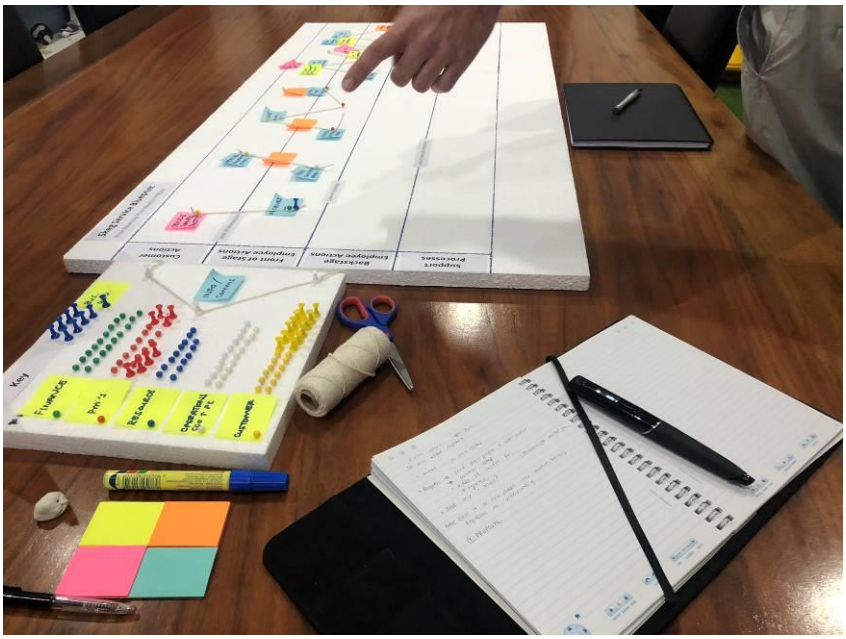

Figure 4.13: Participants walking through the outcome mapping from Workshop 2

Image by: Author, 2018

During the walkthrough the facilitator prompted the Project managers to elaborate more about the content of their introduction emails as well as their weekly emails sent to the customer. It was found that the Project managers had varying approaches to their communication with their customers.

[10] The presentation for workshop 3 can be viewed as Appendix H.

4.4.2 Step three: Mapping section for section

The facilitator graphically indicated the mapping approach and what is meant by “mapping section for section”. This can be seen in Figure 4.15.

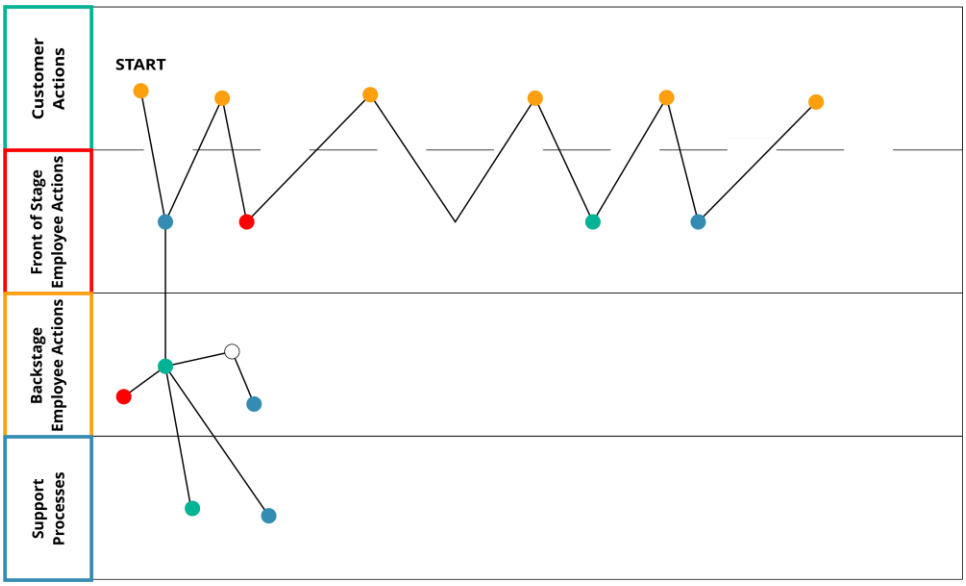

Figure 4.14: Graphic explaining “mapping section for section” approach

Produced by: Author, 2018

The mapping process was left to the participants to discuss and define. From the first point of “Receives PO” (receives a signed quote, also referred to as a purchase order) it was decided that the signed quote is forwarded to the Finance and Administration functions for the project to be “loaded”. This meant “Project loaded” was added to the backstage process. When the facilitator asked what this sub-process entailed COO-W02 explained that a reference number is generated when preparing the original quote. Before he could complete his sentence PM-W01 explained that the project’s reference number is only generated after a signed quote has been received and is an outcome from the “Load project” sub-process. After brief discussion PM-W01 left the boardroom to confirm the details of this sub-process with the Administrative employee directly. PM-W01 returned shortly after to clear the confusion that a reference number is created once a signed quote is received. The initial mapping process is evident in Figure 4.16.

Figure 4.15: Initial mapping process with participants

Image by: Author, 2018

PM-W01 indicated that once a project is loaded the Administrative employee sends an email to inform all the Project managers, the Business development function and the Operations function that a new project has been accepted. This email is referred to as the "Project loaded email", and is added to the mapping. Subsequent to this a project card is generated with a project code and placed in the "landing zone" of the task board for all the business functions and employees to see. The project card consists of basic information regarding the project such as the financial values quoted on, the customer and the project code. The project waits in the landing zone until the next available Project manager has the capacity to take on the project. COO-W02 explained that this is ideally the same day that it is loaded, but it is often a couple days later or sometimes even a week later depending on the workload at time. He added that this is a massive challenge created by the unpredictability of Product design.

COO-W02 explained that the "Project loaded email" is generally what instigates the handover of the project from the Business development function to the Operations function. He explained that a handover meeting is scheduled and Operations is informed of the work to be done and the expectations of the customer. He added that once this meeting has been completed the "confirmation email" from the front of stage operations employee is sent to the customer.

PM-W02 explained that the next available Project manager takes the project and with the Operations function has a handover meeting or discussion based on the handover by Business development. He explained that several processes occur after a project is launched. The Project manager creates a project plan with the assistance of the Operations function and inputs from Business development. The Project manager then contacts the customer to introduce themselves and schedule a meeting (as indicated in the front of stage mapping). COO-02 explained that, as the Head of the Operations function, it is often a challenge to manage the expectations set by the Business Development function. He stated that it often feels like the functions are “operating as islands”.

The facilitator ran through the mapping as it stood from the start point of the customer sending a signed quote to when the Project manager introduces themselves and schedules a project discussion meeting with the customer. It was interesting to note the slight discretions of each Project manager’s approach, most notably when accepting a project. PM-W01 drafts a scoping document to confirm requirements with his customers where COO-W02 and PM-W02 do not. Although it was agreed that all the Project managers work in collaboration with the Operations and Business development functions to build their project plans. This cross-functional collaboration is aimed to align the scope of work to be completed.

PM-W01 explained that the steps of “builds project plan” and “schedules project discussion” with the customer are not always done one after the other and are sometimes performed ad hoc. COO-W02 and PM-W02 both agreed to this point. It was also explained that the “Intro email” from the Project manager is not dependant on the Project plan being complete. It could therefore be deduced that the actions of: customer “receives email from PM”, “Detail project discussion” and the Project manager “builds project plan” are independent of one another. Although it is noted that these actions all need to be completed before any work can be done by employees on the project.

After the facilitator confirmed these points with the participants, PM-W01 added that once the project has been accepted by a Project manager and the project plan is finalized and forwarded to the Administrative function. The Administrative employee adds the task cards of that project to the task board for the next available employee to work on. The tasks are placed in order of priority dictated by the software that records, tracks and documents the accepted projects. The facilitator queried how the system tracks the work done or not done on projects, PM-W01 explained that the Administrative employee updates the system on a daily basis based on each employee reporting their daily progress on task cards that have been designated to them.

COO-W02 explained that there are multiple reasons for “work done” or “not done” in the system. These reasons range from resources working on other tasks already, a task taking longer than expected, a scope change either from the customer or internally or a delay from external sources such as suppliers. He added that it is what the Project managers do with the information and situation that is the real challenge.

PM-W01 mentioned that that is why the morning huddle meeting with the entire business around the task board is so important. He explained that this is when employees can communicate their concerns with the Project managers and challenges can be addressed or avoided all together. PM-W02 added that the daily huddle meetings give the Project managers the opportunity to understand the work being completed on their projects on an employee and task level. PM-W02 elaborated on the tools used to facilitate the morning huddle meetings and the questions posed daily to the employees and Managers. These tools and questions are aimed at determining any preventions, time or quality concerns.

COO-W02 added that there are weekly meetings for Project managers on a Friday morning. This includes the CEO, Business development function, Project managers, Operations function and the Financial manager. These functions congregate and discuss relevant topics on active projects in the business. PM-W02 indicated that he thinks it is important that customers know how much work happens behind the scenes as the map makes it evident that there is a lot more happening than they are aware of.

COO-W02 stated that he once worked with someone that said “if you can’t fit it on to an A4 page it’s too complicated”. He explained that there comes a point where there is too much detail and a page becomes overloaded with information. He added that this needs to be taken into consideration in order to determine when the mapping is “good enough” for its intended purpose. This is necessary as there are multiple internal processes that could potentially occur at some point in the service offering, such as the sub-process of procuring hardware, but this may not be relevant to the study.

COO-W02 offered his time to schedule a one on one discussion interview with the facilitator to discuss the sub-processes in more detail or alternatively decipher the level of necessary detail to map. He added that if it comes to the point that it is necessary to hold another workshop he would be more than happy to partake in one as the case study can see the benefit of mapping the process both from an internal perspective and externally for the customer. PM-W01 and PM-W02 agreed that they would be willing to partake in more workshops if need be. COO-W02 concluded by stating

"don't worry about time, this is important to us too." Hereafter the facilitator thanked the participants for their valuable inputs. The mapped outcome can be seen in Figure 4.16.

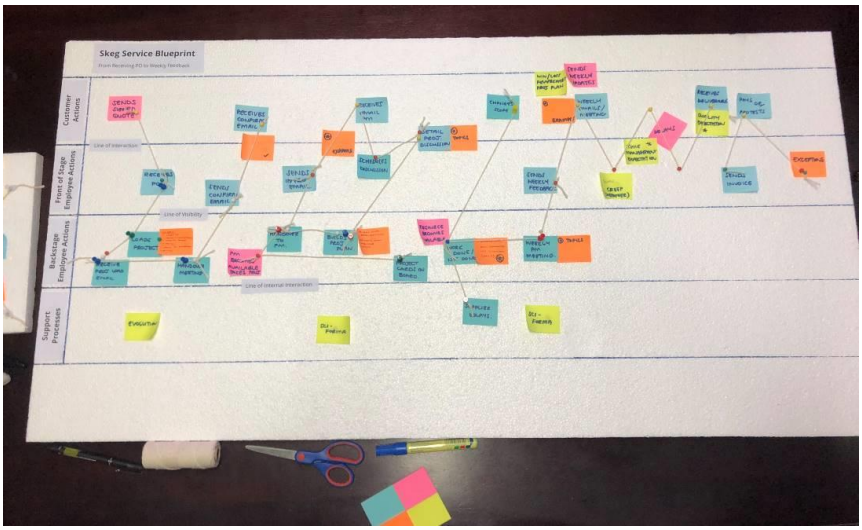

Figure 4.16: Mapped outcome from Workshop 3

Image by: Author, 2018

The orange post-it notes indicate that it is either a sub-process, multiple possible sub-processes or that there are various ways the interaction could be conducted. As expected the physical mapping is done in a rough manner and not particularly neat making it difficult to interpret. The graphic, as Figure 4.18, better illustrates the outcome from Workshop 3.

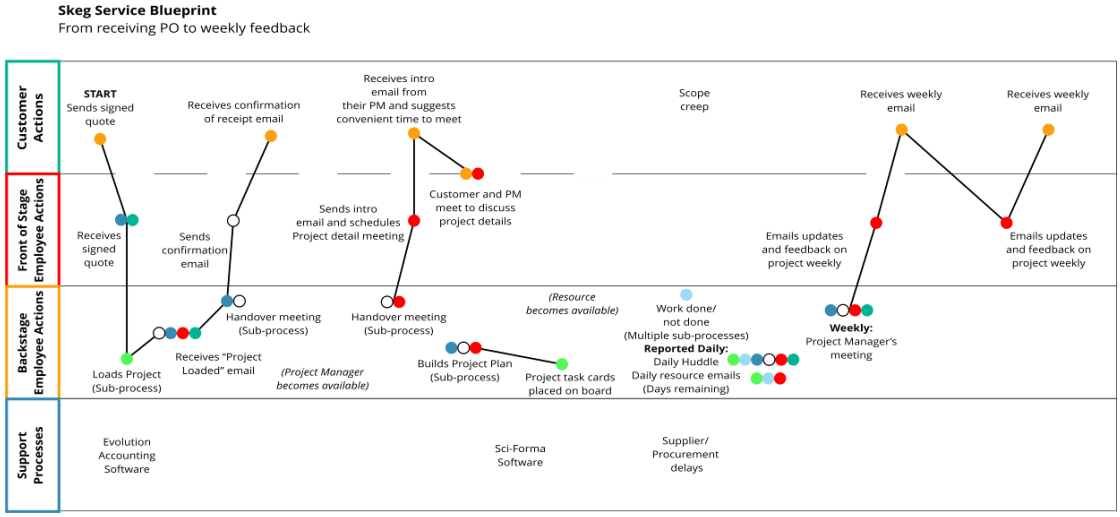

Figure 4.17: Graphic representation of Workshop 3 mapped outcome[11]

Produced by: Author, 2018

[11] The graphic representation of the mapped outcome from workshop 3 can be seen as Appendix I.

4.4.3 Conclusion and next steps

It is understood that there are numerous variables and sub-processes involved in conducting Product design as a service and plotting every possibility would not be feasible or beneficial to the study. The objective of this study was to map the real world workings of Product design as a transdisciplinary service in order to identify and visualise the intangible complexities. It is believed that the service blueprint map has successfully provided this representation.

It was a notable challenge to keep participants focused only the current existing backstage interactions without getting side-tracked into problem solving. Although it was found that this occurred substantially less than in the previous workshops. The mapping process had again led to other topics being discussed but this was viewed as a positive outcome of the process as it instigated discussions around improving the service internally.

It was interesting to note the confusion in the “load project” sub-process, initially by COO-W02 which ultimately resulted in one of the participants confirming the process information with the Administrative employee directly. This served as proof of the value behind such a mapping as stakeholders do not all understand the entire process and specific functions’ roles within the process.

It was also interesting to note the Project manager’s varying approaches to accepting a new project. Some approaches overlapped such as co-creating the project plan with the Operations and Business development functions. Where some approaches differed was when one Project manager indicated that he creates a scoping document to confirm product requirements with the customer where the other Project managers rather meet the customer at the onset to discuss the details of the project in person, if possible.

After the mapping workshops were complete it was found that it may be necessary to hold informal interviews with specific employees in the case study. This would allow employees to have a more open discussion with the facilitator in an environment that is familiar and comfortable to them. Employees interviewed include the COO (COO-W02) for his inputs into the sub-processes and ultimate value of the mapping to Skeg, the Administrative resource, to allow her to explain and demonstrate how she conducts her inputs and work in the process mapped to add clarity. It was also decided that at least one Project manager should be interviewed to discuss their interactions with a customer from the first point of contact to the weekly feedback emails as well as the weekly Project managers meeting.

4.5 Informal Interviews

4.5.1 Discussion with COO-W02 on 26 April 2018

A discussion time was scheduled between the facilitator and COO-W02. This discussion was held 3 days after Workshop 3 had been conducted and lasted 30 minutes in duration. The purpose of this discussion was to touch base with the COO about the mapping and the progress of the research. This discussion did not follow a set agenda but it did raise valuable topics and helped the researcher and participant to see the true value behind the purpose of the study.

To initiate the discussion COO-W02 had asked the facilitator what the ultimate purpose of the mapping was. He had assumed that it was aimed towards improving an aspect of the business. Being an Industrial Engineer by profession, COO-W02 had initially viewed the purpose as a system- and process-driven exercise.

The researcher explained that the purpose of the mapping was to create a tangible and mutual understanding behind the offering of Product design as a service and the way it is currently experienced internally and by customers. COO-W02 explained that,

> I studied Industrial Engineering and not in one of my textbooks on process engineering does it focus on 'How does ones process talk to your customers and support them' which affects your business.

COO-W02 explained that now that he personally has a better idea of the purpose of the map, in his opinion the detail of the mapping should only focus on sub-processes that are relevant and directly linked to the customer experience. Therefore the mapped outcome from Workshop 3 is sufficient for the purposes of the study.

COO-W02 asked the researcher what exactly Service design is. After having defined it during the workshops, the researcher decided to use an example to answer the question. The researcher explained that she had recently had a pleasant experience at an online store collection point. She explained that from the time she had arrived at the building it was clear where she needed to go because there was clear signage. Upon entry there were a number of tablets that commanded the customer to enter their reference number that was emailed to them for their collection. Once entering this number the order was confirmed and the customer was instructed to proceed to the next room. The next room consisted of numbered counters with assistants at each counter point. After taking a seat in one of the many seating options, the customer can see their name appear on a main screen in the centre of the room. When an assistant became available the customer's name would be called to "meet with 'Kyle' (assistant) at counter 7". By the time the researcher had arrived

at counter 7, her package had already been prepared backstage and was ready to be handed over. The assistant was friendly and helpful and because all the details were readily available it required a simple interaction for the transaction to be completed. An experience that is notorious for being tediously long had now become a pleasant experience and taken a total of 6 minutes from entry to departure.

The researcher explained that this is an example of the value of Service design can be. As a customer, the researcher enjoyed the experience with regard to the service which creates loyalty and value perception to that service provider. The design of that service also meant that the service can operate more efficiently and effectively, not only for the customer but also for the employees. When entering the reference number at the entrance and confirming the order, the backstage staff were notified and could collect the items and prepare them so that by the time an assistant became available later in the customer journey, the package is ready to be transacted. Before this process would only occur after an assistant eventually becomes available, which meant the customer journey would be prolonged unnecessarily and ultimately create a negative customer experience. The turn-around time is significantly improved and the business can now operate optimally. Even the fact that the notification screen used customers and assistants names instead of simply referring to numbers, as commonly seen in banks, illustrates that the service experience is more custom and personalized to the customer. It creates a more personified interaction and the user feels more comfortable going in to the encounter.

This narrative made COO-W02 realise and understand the value of Service design as well as define its offering. This started a deep thought process in COO-W02, he said “you are actually making me think”, after a pause he continued:

> So what does Skeg do? We provide customers with a service. The outcome is a product but it is still a service. And (from the customer’s point of view) that service offers an experience. If you take a Service design view of our process… that is pretty damn interesting.

This verbalised train of thought made the researcher realize that possibly the concepts of “service”, “product” and “experience” (terms often referred to in workshops) and their subsequent relationship is not fully understood by the participants involved in the study. The researcher decided that the best way to address this is to generate a graphic to illustrate the terms and present this to participants.

Referring back to the purpose of this study, COO-W02 explained that a process is simply “noise” but the timing and quality of the feedback to the customer is where the real value lies. He added “if you

are looking at this process (mapping) as a service that supports the customer's request to build a product, what are the important steps that add value to that as a service.

To this the researcher replies, "technically all of them should", COO-W02 replied "technically all of them must". There is a pause before COO-02 said "this is pretty damn interesting". He explains that "So now you can start looking at the steps from a customer point of view and how it supports their experience" this is to identify what events or experiences hold the most significant value to the customer such as managing their expectations. He reiterates that the constant feedback to the customer is actually very important and holds significant value as it informs the customer of what is happening behind the scenes.

This discussion proved to be informative and beneficial to both the researcher and COO-W02. COO-W02 gained a better understanding of Service design and the value it holds. He also has a clearer understanding of the purpose behind the study. The researcher gained a better understanding of the interpretation of the topic from a participant's point of view and resulted in the creation of a graphic to more accurately represent the research topic. This improved understanding would be useful to the study moving forward.

4.5.2 Discussion with Administrative employee (ADM) on 5 May 2018

The purpose of this brief discussion was to gain a better understanding of the sub-process of "loads project". This sub-process had been identified in Workshop 3 as a step once the case study receives a signed quote from a customer. There was some obscurity and uncertainty around what is involved in this process by the participants of the workshop and it was decided to ask the stakeholder directly. This would ensure that the process is being represented as close to the real world workings as possible. The administration resource was asked to call the researcher when it became necessary to "load a project". This meant the researcher could observe while the resource commented and explained while she performed the relevant tasks. This also meant the resource could be in a context familiar to her and also minimized the chance of her forgetting to mention a step in the process.

It was found that the process consisted of four steps.

1. Saving the signed quote in a folder on the server,
2. Loading project on Evolution (Accounting software),
3. Project loaded email and
4. Project card to board.

Saving the signed quote is done for record purposes. The resource then opens the original quote sent to the customer, gives it a 7-digit reference code and loads it on to the accounting software for the Financial function. The “project loaded” email is then sent to the Business development-, Operations, Finance functions as well as the Project managers. This is to ensure that all stakeholders and functions are informed of new work entering the pipeline. This email consists of the reference number, project name, who quoted the customer and the amount quoted. The fourth and final step of the process is to make a project card and to place it on the board. The project card consists of information such as the reference number, project name, amount quoted and duration of the project. Once this has been completed it is physically placed on the task board for the business to note that there is an upcoming project, and for the next available project manager to accept. The Administration employee explains that she does these 4 steps simultaneously to ensure that she does not forget a step.

This explanation took less than 4 minutes to complete. It added clarity to the sub-process. This gave the researcher a concise understanding of what steps are involved in this process as well as why it is necessary. It also made the researcher appreciate this seemingly simple process more, as it brought to light its significance in the service which is to distribute important information to the various functions.

4.5.3 Discussion with PM-W01 on 9 May 2018

The purpose of this discussion was to gain a better understanding of the background processes involved in managing a project leading up to the weekly Project manager’s meeting and sending the weekly update emails to customers.

PM-W01 explained that he would be happy to walk the researcher through the process and answer any questions in order to gain full insight into the sub-process. As the weekly updates had been identified as a key element to managing customer expectations, it was decided that having the best possible understanding of the processes involved would be beneficial.

The Project managers meet once a week, on a Friday, and thereafter send their weekly feedback and updates to their respective customers. This meeting is conducted in the war room which consists of all the active project’s updated project plans. These project plans are placed according to their chain index, which is essentially in order of priority, from left to right. PM-W01 explains that this allows everyone to see immediately which projects are currently the highest priority.

The researcher inquired about the agenda behind the weekly Project manager meetings.
PM-W01 explained that the agenda is as follows,

1. Good news,
2. Previous week's meeting notes,
3. Project for project discussion.

He explained that the meeting starts with the project managers mentioning good news, this is any progress or achievements from the week in terms of projects, tasks or even for the case study as a whole. Once this has been done the meeting minutes from the previous week are addressed. This includes any specific to-do tasks that were set from the previous week. Thereafter each project is addressed individually from highest priority. Each topic is addressed in terms of potential risks in the next two weeks, projected costs of the next two weeks and any exceptions that may need attention. He explained that each Project manager is also required to know the current amount spent on their project as well as projected costs remaining in terms of materials and effort – this is to gauge if this is aligned with the project budget. PM-W01 explained that this meeting is generally an hour long.

The researcher then asked if PM-W01 finds the meetings beneficial. PM-W01 replied that it is incredibly beneficial because "it is the only time in the week when project managers, operations, the CEO and finance are in the same room". He mentioned it is very helpful as all stakeholders and functions learn from one another and provide guidance and assistance. He explained that the CEO helps to align the scope of the project to ensure that projects deliver deliverables that are not more or less than the scope of the work quoted on.

The researcher inquired about the weekly updates sent to the customers once the meeting is done.
PM-W01 explained that outcomes from the meeting are sent to the customer, as well as any questions Skeg may need answers on. The weekly emails also consist of various charts related to the progress of the project in terms of completion and budget. The details of these charts will not be mentioned in more detail as they are intellectual property of the case study.

The researcher asked where the charts are found and how they are generated. PM-W01 showed the researcher and explained that the Administration employee updates the charts and saves them in a 'send-able' format on Thursday's for the Project managers' convenience purposes. This is then sent to the Project Manager's on a weekly basis for their perusal to ensure that they are always up to date and saves them in a send-able format on Thursday's for the project manager's convenience

purposes. He explained that the charts are generated from the reported work done/not done by employees during the week as well as the time sheets that are completed on a daily basis.

This discussion gave the researcher significant insight into the various processes and challenges involved in managing a project. It became evident that there are multiple factors that influence the Project managers and the information they are equipped with to manage customers' expectations. It also brought to light the extent of work and effort which is done in 'the background' to ensure that customers are sent weekly updates on their projects.

4.6 Observations

4.6.1 Daily huddle meetings

This meeting is performed on a daily basis within the case study. The entire business congregates around the task board to discuss daily tasks. Each employee is delegated one task on a project to complete which is their primary focus until that task is completed and they are briefed on a new task. The room of employees and functions are presented with four questions:

1. Is there anything preventing you from completing your task?
2. Do you have any time concerns? Ie: you do not think you will finish within the agreed upon time.
3. Do you have any quality concerns?
4. Is there a means you can finish your task sooner? ie: if you had assistance.

This process allows the business to assist each other with any potential challenges and avoid any issues later. It also improves the communication within the functions of the business.

The huddle meeting is also used to address specific internal topics such as the importance of filling out time sheets and reporting on days remaining on tasks. More importantly the implications these have on managing customer expectations.

4.6.2 Absence of the Administration employee (ADM)

On a particular day the Administration employee was absent from work. A seemingly simple task, such as filling out a sticker for a courier to collect a completed project, was not understood. There was confusion around which sticker needed to go onto what package and where and what the words on the sticker referred to. This is a task that is often completed by the Administration employee but it became evident that she is the only one who knows how this task is performed. It took a total of four employees to figure out which sticker to use, the placement and relevant details required for the sticker. This is a simple observation and example of how functions operate independently of one

another, however, at the same time, also rely on one another to be performed correctly. It is a challenge when only one person is aware of a process and how it is conducted as this creates a dependency to a particular person.

4.6.3 The use of the final mapped outcome after the workshops

The final outcome map has since been printed large scale and placed on the CEO's office wall. It was observed that the map is utilised as a mechanism for understanding and a tool for discussion between the CEO and various stakeholders and functions within the business. In one instance it was used to have a detailed conversation about the internal processes required of the COO once a signed quote is received. On a separate occasion it was used to give an employee context into their role and the importance of their role, and more specifically the significance of reporting completed work. These instances justify the value and significance of mapping a process to the context in particular.

4.7 Workshop 4: Collaborative analysis and evaluation of findings

Literature sources had revealed a number of complexities within Product design as a service. The data collected over the course of this study would either support or challenge the literature findings. Either way, mapping the current real-world workings of Product design would add greater clarity to the intangible aspects of this field of expertise.

An objective approach was crucial to the analysis of the findings of this study. In an attempt to do so, it was decided that a collaborative analysis workshop would be conducted with all the participants to discuss the mapping process and subsequent mapped outcomes. Table 4.2 indicates each previous workshop that had been conducted until that point had been mapped and why it was mapped.

Table 4-2: Breakdown of mapping workshops

Workshop No.	Title of workshop	What was mapped?	Why was it mapped?
Workshop 1	Delineation	Ideal customer journey according to participants	To identify the process within the case study that would benefit the most from a visualisation
Workshop 2	Customer to front of stage employees mapping	Current customer to front of stage employee interactions	To shift focus to the existing interactions between the customer and case study employees
Workshop 3	Backstage service blueprint mapping	Current internal processes and sub-process that support the front of stage employees	To identify and represent the existing "behind the scenes" complexities in offering Product design as a service

Collated by: Author, 2018

It was noted by participants that the workshop-style interaction provided a comfortable platform for discussion (ID-W01). Therefore it was decided to conduct a collaborative analysis and discussion around the findings of the study using a similar platform. This session involved all the participants from the previous workshops, with the main objective of presenting the mapping process completed during the three co-design workshops. The session also allowed for the sharing of research findings and the presentation of the mapped outcomes from the process. As not all participants had been involved in all three workshops it was important to recap each workshop, the exercises completed and the outcomes necessary for exercises in the workshop to follow. This also gave the participants a context as to how their inputs were used, and how their contributions assisted in shaping the emerging map.

This final workshop allowed the participants to analyse the process and mapped outcomes from their own perspective instead of the researcher making subjective assumptions about the findings. This also allowed all the participants to voice their perceptions, physically view the end outcome of the study they contributed towards and potentially identify how it could be taken further for the purposes of the case study.

At the start of the workshop the facilitator thanked all participants for their involvement and contributions towards the study. The facilitator proceeded to give a brief presentation of the progression of the workshops within the study. The facilitator introduced the various research activities and findings. The presentation made reference to the development of the project and influential moments throughout the study. [12]

The presentation commenced with a walkthrough of a graphic indicating a service, as offered by Skeg (Figure 4.19 to Figure 4.21). It must be noted that the visual was inspired by the discussion with COO-W02. The graphic depicts the transdisciplinary service that Skeg offers, ending in the production of a physical product.

[12] The presentation for the collaborative analysis of findings can be seen as Appendix J.

Figure 4.18: Product design focus on physical end product

Produced by: Author, 2018

It was explained that in offering the service there are various experiences that occur, from customer experiences with the business (Figure 4.20) to the internal employee experiences, which happen behind the scenes amongst different employees and functions of the business (Figure 4.21).

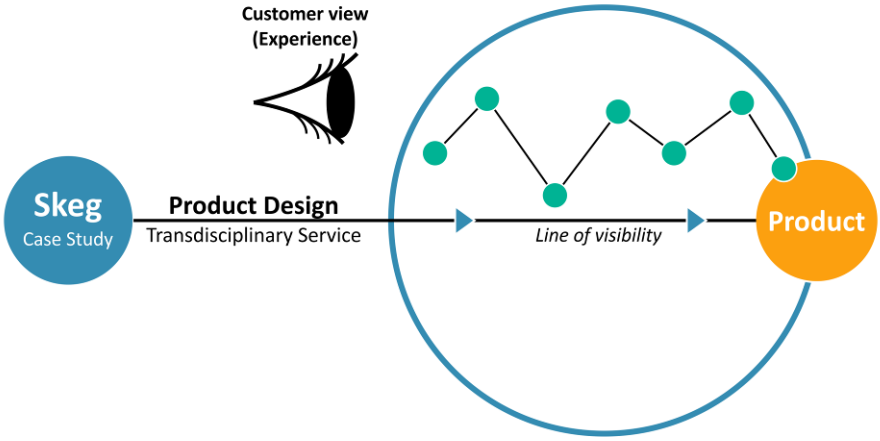

Figure 4.19: Customer experiences of Product design as a service

Produced by: Author, 2018

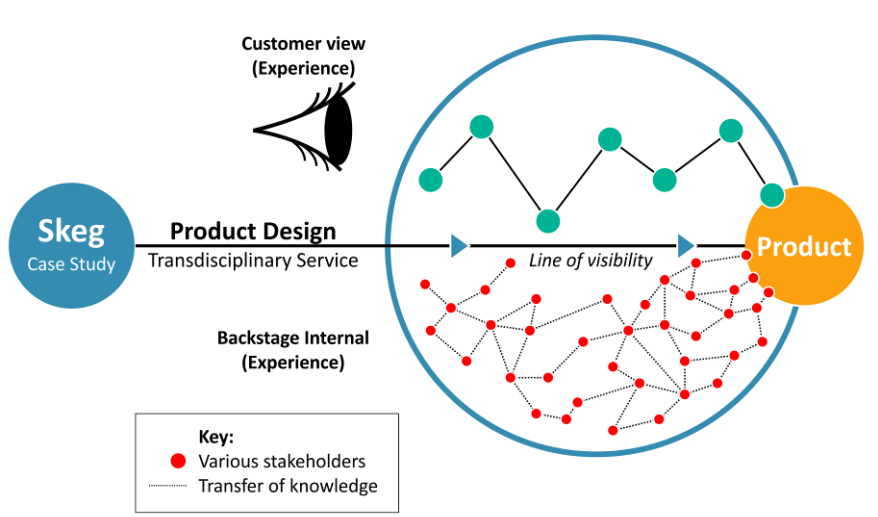

Figure 4.20: Customer and employee experiences of Product design as a service

Produced by: Author, 2018

This visualisation and explanation ensured that all the participants understood the context and the terminology used. This was necessary as it had become apparent from various interactions with individuals, and feedback from participants throughout the study, that understanding the terminology and intangible service context was a challenge.

Following the introduction and contextual positioning, each workshop and subsequent findings from that workshop was explored that lead to the final mapping. Each workshop's activities were briefly explained, supplemented with images and the final graphic outcome. The presentation concluded by posing the statement "so what?" to the participants. The short, simple and open-ended question allowed for a broad discussion, including various topics directly relating to-, and not relating to, the research topic.

In order to support the discussion, participants were asked to frame their discussion around the impact on them as an individual, and them as part of a design-business as per Figure 4.22. This meant that there was structure to the discussion, and that topics discussed remained relevant to the research, but did not restrict the participants.

	To you, The individual	To Skeg, The business
The Process of Mapping		
The Physical Mapped Outcome		

Figure 4.21: Table to guide evaluation discussion

Produced by: Author, 2018

The discussion was initiated with probing questions from which topics and themes emerged. Further discussions around the emerging themes occurred naturally among participants. A summary of themes and sub-themes can be seen in Table 4.3.

Table 4-3: Summary of themes and sub-themes

Theme	Sub-Theme
Understanding processes	"Why" behind processes
	The difference between "says", "should" and "is"
Observations derived through the mapping	A broad view of employees, functions and processes
	Identifying the gaps and disjoints
	No actual "work" involved in mapped outcome
Participants' comments on the mapping process	
Solution-driven discussions	Combine existing Standard Operating Procedures (SOP) and Mapped outcome
	Automate the simpler employee-dependent processes

Collated by: Author, 2018

4.7.1 Understanding processes

4.7.1.1 The "Why" behind processes

COO-W02 had mentioned that it is "great to have a process but it is only useful if it turns into actions". Later in the discussion COO-W02 added "there is a reason why we do what we do". He reiterated that every process and sub-process has a "why" behind it. He explained that just as the process of sending an invoice is to trigger the customer to pay for work completed, there is purpose behind every other internal and external process. Referring to sub-processes in the mapped outcome, he mentioned that the morning huddle meeting is used to drive effective action and the

weekly feedback emails are aimed towards customers in order to consistently manage their expectations.

ID-W01 observed that,

> Most interactions with the customer are just emails yet there is so much work and so many people involved behind the scenes to create the content for those emails. (ID-W01)

PM-W02 explained that the main objective of the emails to the customer is to continuously manage their expectations and that this is essential in the world of Product Development as it is so unpredictable and constantly changing. CEO-W01 added that the processes at Skeg have many layers that are aimed at keeping customers' expectations managed in the hope that they never leave.

4.7.1.2 The difference between "says", "should" and "is"

CEO-W01 mentioned that the map provides a view of what everyone is experiencing, not necessarily what should be experienced. After contemplation he reassesses his comment. He raised the topic of what people "say" they are doing, what they "should" be doing and what they "are" doing is very seldom aligned. He mentioned that it is very tricky to distinguish and he cannot tell which one of these the mapped outcome best represents but settles on the fact that it consists of a combination. COO-W02 added that if the mapping had gone further to expand on each sub-process in detail it would be easier to distinguish whether the map represents what is "said", "should" and what "is" being done. EN-W01 explained that the map is "currently the best replication of what we are doing now, whether it is right or not is irrelevant". CEO-W01 explained that "the benefit of the mapped outcome is that the map shows what we "think" is happening and now it can be put to the test."

EN-W01 posed the question of "when does this (map) turn into a recipe to follow?" He explained that, as an Engineer, he likes to follow a systematic process and tracking the progress. It is at this point that CEO-W01 briefly explained his latest internal project; a project management dashboard. He aims to create a more systematic process that will eliminate unnecessary dependencies and simplify internal processes.

4.7.2 Observations derived through the mapping

4.7.2.1 A broad view of employees, functions and processes

COO-W02 commented that the map provides "a broad view of a focused process". This allows one to have a top view of all the stakeholders and functions and makes it quick to see if something is wrong. PM-W01 added that he, as a Project manager, can quickly see where and how he is involved in the

process by simply looking at the placement of the red dots (representing Project managers on the map). He adds that “it is clear where everyone fits”.

This is made evident when COO-W02 had noted that the Business development function (blue pin) moves from being a front end stakeholder to being predominantly back-stage throughout the mapped process. All Project manager’s agreed that this makes sense as Business developments’ main purpose in the business is to acquire the most accurate quote to provide to the customer. Thereafter the responsibility shifts to an Operations function and the person responsible for managing the project.

CEO-W01 observed from the map that from the time the customer sends the case study a signed quote to when they receive an email response, there are eight stakeholders, inter-dependencies and cross-functions involved internally. He added that “we are paying lots of salaries to send an email”. This initiated a more detailed discussion around CEO-W01 and his project management dashboard. This topic also speaks to the topic of understanding the “why” behind processes as some of these interactions may not be entirely necessary for the required outcome.

4.7.2.2 Identifying the gaps and disjoints

CEO-W01 explained that delays in interactions to the customer are often caused by gaps, or disconnects, in the internal processes. He added that the delays are frequently caused as a result of the process being manual and dependent on people instead of being automated. CEO-W01 explained that if you ask a table of people how an invoice is sent, you will receive different answers and it is these differing answers that are the “holes” in the process. He added that it was interesting and helpful to see in the mapping as it makes the holes blatantly obvious. This comment initiated a discussion around the disjoint in communication between Operations function and the customer once a signed quote has been received.

COO-W02, as head of the Operations function, especially referred to the “Handover to Operations” sub-process on the map. He expressed his frustration that Business development function has weeks and sometimes even months of information and knowledge relating to a project and it is handed a project and hands it over to Operations in a brief 30 minute meeting. He expressed that his frustration lies in the fact that he senses that they are expected to be on the same level of understanding.

CEO-W01 explained that the purpose behind the “Handover to Operations” meeting is not to brief Operations on the entire project description and specifications, but make them aware of the project

and any potential challenges or foreseeable urgencies. He added that it is used to “make Operations aware of the context of the project and not so much about the details around the product”. This discussion had further highlighted the importance and possible consequences of understanding the “why” behind a process and sub-process and the frustration it causes when not all stakeholders and functions have a full understanding of the purpose and objectives.

COO-W02 explained that if a Project manager is readily available to accept a project then the entire “Handover to Operations” sub-process is no longer necessary and that the two “Handover” meetings can be amalgamated into one. This would simplify the back stage processes, cutting out sub-processes and ensure that the flow of knowledge is consistent across the different functions of the business. PM-W01 suggested that the Business development function should be part of the initial introductory briefing between the Project manager and the customer as Business development has already established a relationship with the customer. CEO-W01, and head of Business Development, acknowledged this was a good suggestion for future work.

4.7.2.3 No actual “work” involved in mapped outcome

CEO-W01 observed that within the entire mapped process there is no actual “work” on a project being done. The participants agreed that this falls under the sub-process post-it note of “work done/not done”. PM-W01 added that even without any work being done on a project, it costs the business money. He added that the map is quite a useful tool for the case study as it illustrates all the steps involved and can be used to assess the additional time and money spent on projects without any work being done. PM-W01 further added that the expenses and time are understandable and crucial for the larger projects but often unnecessary for the smaller once off projects as it becomes expensive and redundant.

PM-W01 later added that “maybe we should work out how much it costs to perform the admin tasks”, referring to sub-processes such as “load project”, “build project plan” and “daily huddle”. He explained that this could help Skeg to establish a benchmark for costing a project to ensure that it is profitable and makes financial sense. To this COO-W02 commented “and so the penny drops” and the participants laughed. He gestured towards the facilitator that “this is stimulating quite an interesting debate”.

This comment suggests that the discussions and topics addressed may not have been eminent or assessed at all if it weren’t for the study and its objectives. It also proves that the map helped

stakeholders gain a better understanding of the context in which they operate, regardless of how long a person has been working for the business.

4.7.3 Participants' comments on the mapping process

ID-W01 explained that the workshops provided a comfortable platform for discussion. She explained that often stakeholders from various functions would have informal discussions around issues and challenges faced over lunch but it never resulted in anything more than the conversation. She added that,

> The whole mapping process and visually seeing something with everyone's input highlighted issues that others may not have even been aware of (ID-W01).

ID-W01 explained that to map out a process helps everyone to see everyone else's perspective and perception of a process and can make a discussion more productive. CEO-W01 explained that the mapping process means "everyone's version of the reality is crystalized". He added that the fact that there's a picture provides individuals with clarity and business effectiveness as there is no more debating about what must happen. These statements prove the success of the study in providing a means to make the intangible visible through the form of a physical map. This map is proved to be an effective mechanism, to not only understand a process or interaction from multiple points of view, but also to address specific interactions in a constructive and informed manner.

PM-W01 mentioned that the "process of mapping was great because it meant one can see what happens where, I (PM-W01) had a good idea, but still learned more and things became more clear." It should be noted that PM-W01 has worked at Skeg for 13 years. This comment supports another main objective of the study; to make a complex process clear and concise in order for stakeholders to better understand the internal process and their role in the service offering.

The researcher posed the question of whether the map would be useful to potential new employees in future. Participants all agreed that it would be valuable. PM-W02 added that he feels the "map would even benefit the guys on the floor to see what we (Project manager's) do". He explained that the manufacturing employees are often unaware of the interactions that happen with the customer and the importance of these interactions for the project as a whole. He added that the floor staff could have a better understanding if they could see the complexities in the flow of knowledge. CEO-W01 added that they would then better appreciate the meaning behind processes such as morning huddle meetings and reporting on work done or not done on a daily basis.

4.7.4 Solution-driven discussions

It was found that this collaborative discussion had contributed towards two distinct solutions that were suggested and briefly addressed. PM-W01 had suggested combining existing SOP (Standard Operating Procedure) documents with the mapped outcome and CEO-W01 mentioned his own project with the topic of automation. The first solution had been suggested as a direct result of the discussion. The automation solution is a topic that CEO-W01 had been actively working on throughout the mapping process but had more clarity subsequent to the mapped outcomes.

4.7.5 Combine existing Standard Operating Procedures (SOP) and Mapped outcome

ID-W01 mentioned that she is interested to understand why people don't follow processes. CEO-W01 explained that there are three reasons why people do not follow processes, even if they have been clearly explained and documented. He added that at Skeg, there are numerous SOP documents that have been compiled that explain specific sub-processes clearly and concisely, yet they are still not followed. COO-W02, who has worked at the case study for 3 years, explained that he knows that there are SOP documents but personally he does not know where to find them and thinks that there are too many of them so it inevitably becomes confusing.

PM-W01 explained that the SOP documents are currently located in various places on the business' server and should possibly be collated and put in one dedicated place where everyone has access to it at any given time. He added that the mapped outcome could be used in conjunction with the SOP's to make them easier to locate and structure. He explained that the map and subsequent sub-processes could be coded with labels and numbers to coincide with the appropriate SOP document. He suggested that a large printout of the map could be placed somewhere in the building for all employees to see and the coding on the map can be explained to navigate to the correct SOP document relevant to that process.

PM-W01 explained that this would help, not only the existing employees to better understand their work environment, but also new employees to gain insight into processes and procedures in a more effective and efficient manner. PM-W01 added that the map and the SOP's could also be updated regularly as the processes are adjusted and changed. The general room of participants agreed with the suggestion made by PM-W01 and continued to hold separate conversations regarding the suggestion and how it could be implemented.

COO-W02 concluded by saying "to me, a process does not belong on a server", implying that processes need to be made visible in order to be fully realised and understood by all.

4.7.6 Automate the simpler employee-dependent processes

A recurring theme that presented itself throughout topics was the topic of automation. When discussing the topic of the mapping process, CEO-W01 had initially mentioned that,

> What would be interesting is to note the trigger and automate a sub-process that is currently manual (CEO-W01).

After the observation was made that there are multiple stakeholders involved in the process of receiving a signed quote and sending a response email to the customer, CEO-W01 mentioned that the first few steps in the sub-process rely heavily on multiple individuals. He added there is the potential to automate this in order to by-pass the human dependency factor. He explained that in an ideal world after receiving a signed quote from a customer it should be as simple as pushing a button and all the relevant information is sent to the relevant functions and employees in the business. He explained that he doesn't understand why it is necessary to have so many employees involved in something that should be a simple process and interaction. He suggested that if the process was automated it would require only one person, potentially Administration, to complete.

CEO-W01 explained to the room of participants that he has been working on an internal project to improve the efficiency of the simpler internal tasks. He explained that this would remove unnecessary tasks and dependencies from individuals to ensure that the process runs smoothly and more efficiently. He added that the tasks are then also not constrained by manual processes. It would also remove redundant or tedious tasks from employees in order for them to use their time on more important matters.

CEO-W01 explained that in his opinion he would like to map each process at Skeg, similarly to that completed in the workshops of the study, to gain a better understanding of who and what each sub-process entails. He would then compare this to what it should be in an ideal world and then assess whether it is possible to automate the sub-process or parts of it. The result would be to release the dependency from employees in order to optimise the efficiency of the overall process. This would not only remove time-consuming tasks from employees, but also improve the efficiency and quality of the interaction with the customer, leading to greater customer satisfaction.

4.7.7 Making sense of the collaborative evaluation for discussion purposes

Following the collaborative workshop, the discussion points raised by participants were collated through various maps to establish the major themes and sub-themes. Findings from the previous workshops were later added to the maps to support and validate these topics and generate a

justified and informed argument. The various maps and diagrams of this process can be seen in Figure 4.23 to Figure 4.25.

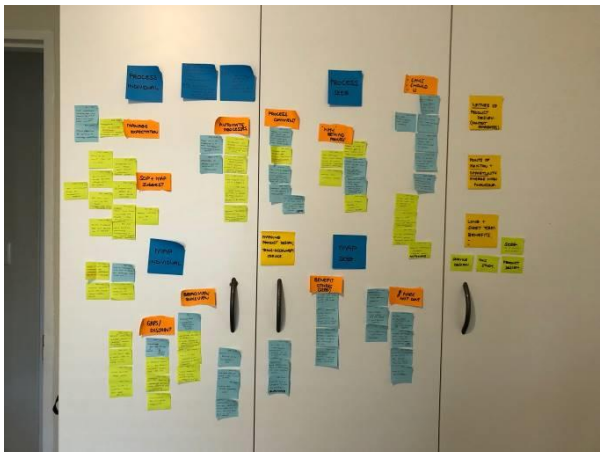

Figure 4.22: Map iteration 1 of themes and sub-themes

Image by: Author, 2018

Figure 4.23: Map iteration 2 of themes and sub-themes

Image by: Author, 2018

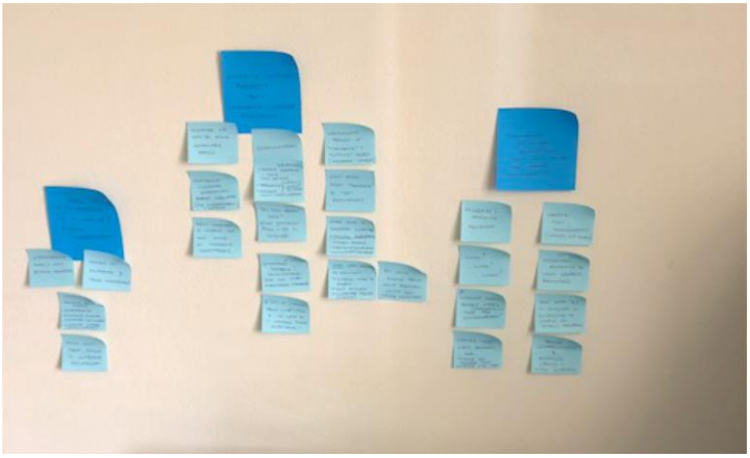

Figure 4.24: Map iteration 4 of themes and sub-themes

Image by: Author, 2018

4.8 Conclusion

Throughout the duration of this study there were a number of interesting discussions and topics that emerged. Some relating to the objective of the research, others forming as a result of the employed research methods. Through the use of three co-design workshops a version of the current real-world workings of Product design was mapped. These mappings were found to support and validate many statements made by literature sources. The mapped outcomes, although not specific to a particular customer or project, visually represents the previously intangible inner workings of Product design processes. It is eminently clear that the field of Product design is complex and challenging as proven through literature and accumulated data. Product design relies on various cross-function processes that transfer knowledge and information. The key lies in what is done with this vast amount of knowledge and information that dictates the successful implementation of Product design as a transdisciplinary service. This study will now address specific topics and themes that emerged to make sense of this information and what it means to the case study as well as the greater field of Product design.

5 CHAPTER FIVE: DISCUSSION

5.1 Introduction

During the course of this study a number of deductions and themes emerged. These themes include: the need to shift focus in order to design improved and enhanced experiences within a service, the greater implications due to the lack of internal understanding and, what has been done towards managing customer expectations thus far. It has also been identified that managing customer expectations should start as an internal exercise by assessing existing internal processes and creating transparency. Before expanding on these themes it is necessary to define the success criteria for Product design as a service.

5.2 A successful Product design service is more than the end product

It has been identified through findings and literature that offering Product design as a service needs to provide more than a well-designed superior end product. Instead literature sources have suggested that the key to providing a successful service in the modern world lies in the experiences it offers. Recent studies have revealed a direct link between customer satisfaction and employee satisfaction (Chi & Gursoy, 2009:252). They have also shown a positive relationship between customer satisfaction and the financial performance of a business. By default in order for a business to improve their financial performance they need to create enhanced customer and employee experiences.

In order to capitalise on the true value of experiences one needs to acknowledge the links between experiences within a service offering. Figure 5.1 illustrates that a Product design service experience consists of customer and employee experiences, touchpoints and the end product. The graphic illustrates the impact of a negative backstage experience (Point A) and the ripple effect this has on associated internal interactions that result in a negative impact on the customer experience (Point B) and therefore leading to a negative service experience. In extreme cases and depending on the extent of the negative experience, this could also have a negative influence on the end product. Point A's negative employee experience could result from a number of reasons. An example could be misunderstood or misaligned processes resulting in a frustrated employee who cannot effectively fulfil the intended purpose of a process and subsequent interactions. This could lead to miscommunication amongst employees and cause delays which will lead to dissatisfied and frustrated customers.

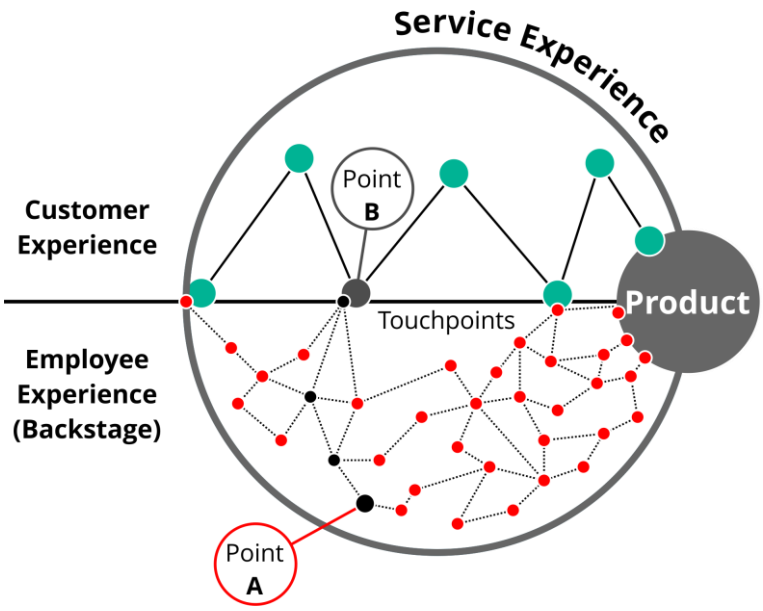

Figure 5.1: The influence and consequence of a negative employee experience

Produced by: Author, 2018

Theories amongst researchers and businessmen exist, but it is currently unknown which experience has more influence. The same rippled impact would apply if Point A was a positive employee experience. A satisfied and motivated employee would provide an improved work efficacy and efficiency therefore diminish delays and lead to satisfied customer experiences. It is important to leverage this relationship as it will lead to shared benefits or consequences for all stakeholder experiences as well as the overall service experience.

Therefore the success of a Product design service lies in creating a superior service experience. This can be seen as achieving customer satisfaction and retention, enhanced employee experiences, employee retention as well as providing well-designed products, thus to optimise financial performance.

Primary and secondary findings have suggested that design-businesses need to extend their focus to design not only superior end products for their customers, but also actively design an overall satisfactory service experience catered specifically towards their customers and employees.

5.3 Processes and roles: greater implications from a lack of internal understanding

The accumulated data has found that employees do not fully understand their role and responsibility within a service, nor do they completely understand others' roles. In some instances employees know "what" a process entails but there is a misalignment in understanding "why" it is necessary.

And in other cases employees understand the purpose behind a process but do not understand "what" the process is. In some extreme cases employees are completely oblivious to processes.

In order to optimally perform a role in a process an employee, whether they are frontstage or backstage, needs to understand what the process entails and why it is relevant to the service. If the purpose behind a process is not understood the process will occur as it should but it will not fulfil its intended purpose. This could also lead to situations of internal miscommunication and frustration. This was evident from the case study when participants discussed the sub-process where the Business development function meets with the Operations function to discuss new projects entering the pipeline.

COO-W02 expressed his frustration that the Business development function has extended time and shared information with customers which is handed over to Operations in a brief handover meeting. He explained that frustration lies in the expectation that he is required to be at the same level of understanding. CEO-W01 had to clarify that the purpose behind the meeting is not to brief Operations on the entire project but rather to make the function aware of the project and any potential challenges or foreseeable urgencies. This discussion highlighted the importance of understanding the "why" behind a process and the frustration it causes when not all stakeholders and functions have a full understanding of the purpose and objectives.

A similar domino effect occurs if the purpose of a process is understood but the steps involved in the process are not known. None of the participants of Workshop 3 (which involved the CEO, COO and all the Project managers) could elaborate on the administrative sub-process of "Loads project". The purpose behind this process was mutually understood but it was unbeknown to the participants how it is conducted as it is completed by the Administrative and Finance functions of the business. After some debate, PM-W01 left the workshop to ask the Administrative resource directly to explain and clarify the steps involved.

In some more extreme cases it was identified that employees and functions are completely oblivious to the processes of others. PM-W02 explained that "the floor staff are often unaware of the interactions that happen with the Project managers and the customer" and the importance of the interactions for the project as a whole. If there was a better understanding of the processes and their impact on customer interactions and experiences there could be an improved compliance and appreciation for the purpose behind processes.

Understanding processes and roles are key to employee performance. How can employees and functions operate optimally if they do not have a complete understanding of what and why they perform certain activities. Beyond this, how can businesses and employees support one another if they are ignorant to each others workings and their role in the service offering.

Literature sources have indicated that in order to effectively enhance employee experiences within a service, the business needs to provide support to its employees (de Belgeonne et al., 2017:33). This is especially important when employees work in a highly complex and demanding environment, such as Product design. Providing employees with a desirable working environment leads to satisfied employees who are both loyal to the business and provide customers with a superior service experience (Chi & Gursoy, 2009:245).

It was noted through literature and observations that businesses have made attempts to support employees through internal backstage processes. The case study currently makes use of a daily “morning huddle” meeting where all employees and functions of the design-business congregate to discuss and support one another’s tasks. The case study also mentioned a weekly “Project managers meeting” whereby cross-function managerial roles meet to converse and support one another on a project level. Findings suggest that these processes would be less effective than intended if there was an incomplete understanding. This includes the significance of the encounter and the impact this has on the customer- and overall service experience.

If internal processes are not fully understood in terms of "what" they entail and "why" they are necessary, these processes cannot optimally fulfil their intended purpose. A lack of mutual understanding in processes also creates dependencies within the business. This means that processes can only be completed by a particular employee or function. If said employee is absent or busy this creates a bottle neck to the entire process and flow of work.

It is these dependencies that lead to functions, what COO-W02 referred to as, “operating as islands”. Meaning each function is self-sustained and operates independent of the other functions in the business. These independent functions cause challenges in providing a consistent service experience. This means there is no coherency across functions which leads to the customer suffering as a result.

Dependencies also lead to bottlenecks and delays in processes which will have a negative impact on the customer experience. A combination of delays causing negative customer experiences and functions operating independently has even been found to have negative impacts on the design of

the end product of the service. The Business development function provides a quote to the customer based on what the business feels is best suited for the product in the long term. Owing to the delay between communication across functions, when the Operations function takes over control of the project, decisions are shifted away from what is best for the product and are instead based on satisfying the already frustrated and dissatisfied customer. These consequences have been illustrated in Figure 5.2.

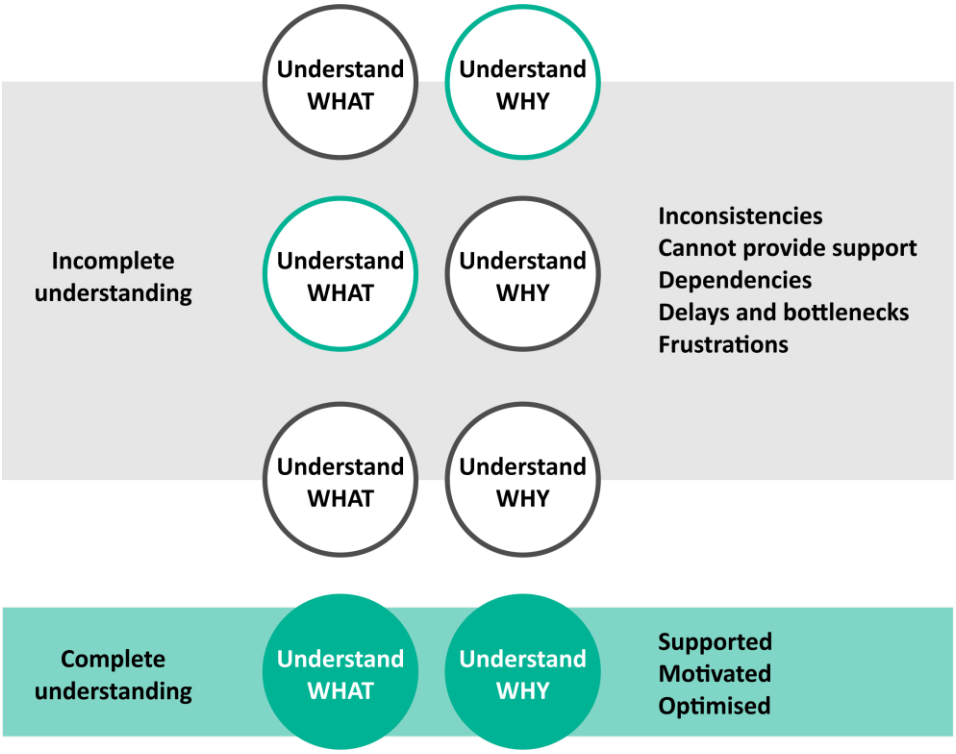

Figure 5.2: The significance and consequences of incomplete understanding

Produced by: Author, 2018

Therefore a lack of internal understanding of roles and processes is imperative to the overall service experience. A lack of understanding makes it near impossible to provide effective support to employees. The consequences also extend to negatively impact the employees and cross-function activities within the business in the form of delays, dependencies and inconsistencies. And these in turn influence the customer experience and their expectations of the service. In summary, every lapse in understanding that occurs within a business creates a gap or disconnect in a process which has associated negative impacts on the customer journey and success of the service.

5.4 Managing customer expectations: all talk and nothing to show

Primary and secondary research has identified that managing customer expectations is currently one of the biggest challenges faced in the Product design industry. This is not surprising as literature and case study discussions have proven that Product design consists of various complexities, one of which is its unpredictable nature (Eppinger & Ulrich, 2012:4) (CEO-W01).

There have been multiple discussions around "managing" and "setting" expectations and the significance it holds for businesses. Yet after all these discussions very little has been done to actively manage customers' expectations. Instead it has been found that businesses, consciously or sub-consciously, invest their focus on improving customer experiences. This may be as a result of a lack of definition of the terms and their relationship or an assumption that the terms are synonymous.

It is defined that every time a customer comes into contact with a business the gap between their expectation and their actual experience is the difference between customer satisfaction and customer dissatisfaction (Meyer & Schwager, 2007:3). It is acknowledged that enhancing customer experiences is crucial to secure a sustainable service. Poorly managed customer expectations leads to poor customer experiences. Therefore better management of customer expectations will result in enhanced customer experiences. However, this is not true for the inverse. As evident in Figure 5.3, improving customer experiences is not an indication that expectations have been better managed.

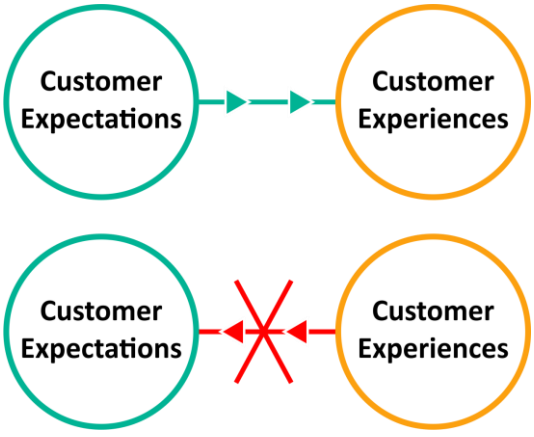

Figure 5.3: Relationship between customer experiences and customer expectations

Produced by: Author, 2018

Businesses have been found to turn to communication as the key to managing customer expectations. It is assumed that by diminishing delays in responses, increasing frequency of communication and including more detail into points of contact will lead to better expectation

management. Although these may effectively improve the customer experience, it does not necessarily mean that what is being communicated better manages the customers' expectations. This view is supported by PC-W01 who stated that "constant feedback to the customer does not mean expectations are managed."

The importance of customer communication is essential to supplying superior customer experiences and managing customer expectations is more important what is being communicated rather than how. In Workshop 1 CEO-W01 stated that "the customer is not so stressed about what the news is as long as the news matches their expectation."

Therefore diminishing delays in responses, increased frequency of communication and including more detail into points of contact means that the customers' expectations will still be missed and they will be made aware of it sooner, more frequently and in greater detail.

Perhaps more needs to be done to prepare customers before engaging with the service. Pre-service actions, where it is agreed most expectations are set, need to inform customers of what to expect from their experience with Product design as a service.

In their ideal pre-service customer experiences, the case study indicated sharing an existing "Product development: according to us" document with customers. This document provides the customer with insight into the complexities and what to expect in the Product design world. This has been found to be insufficient as customers are still expressing frustration from delays and unforeseen challenges whilst engaging in the service.

This frustration could also be as a result of functions operating independent of one another. The Business development function is familiar with the content of the document and shares this with the customer early in the customer journey. Owing to the possible time lapsed before the customer accepts their quote the documented challenges may have been forgotten about. In addition to this, it was evident that other functions are significantly less familiar with the content. This was evident when EN-W01 required an explanation for basic Business development terminology that the Project Managers did not appear to fully grasp.

There is a need for all functions to become familiar and have a mutual understanding of their complex working world of Product design. This could effectively be used to create coherency in the service experience. The various functions need to provide constant reminders to customers of what

they need to expect in the service. This is a simple example of how businesses need to better manage customer expectations by shifting their focus internally.

5.5 Managing customer expectations starts from inside

Duncan, Jones and Rawson (2013:6) explain that the root causes of poor customer expectations, more often than not, stem from inside a business and are predominantly caused as a result of cross-functional disconnects. Instead of focusing on the interactions between the customer and the front of stage employees businesses need to adopt a more inward facing approach. The key to managing expectations may be found within the backstage interactions that customers are not aware of.

5.5.1 Reassess and optimise processes

Processes are put in place to serve a particular purpose. These processes are implemented on a regular basis but are seldom re-evaluated for their fit and purpose to the business.

With the new shift in focus on enhancing experiences within a service, it is necessary for businesses to reassess their internal processes currently in place and its impact on the service offering. This requires businesses to investigate and interrogate the “what”, “why” and “when” elements of their processes. In essence:

1. What are all the steps involved in the process?
2. Why are these steps necessary? Is there an intended purpose behind each step and is it being fulfilled?
3. When in the customer journey is this process being employed? Based on previous experiences, is this the best time for this process to occur?

In order to optimise a process a business needs to have a holistic understanding of each process in context. This not only creates a better understanding but also means each process can be optimised from a more informed perspective.

For example, it was noted by the case study that customers assume that their projects are started immediately after the signed quote is sent and the commencement payment is made. This is because it has not been communicated to them otherwise. If this is a known customer assumption, reassessing when the customer is required to pay their commencement payment may hold some significance to managing their expectations. If customers associate the commencement payment with the start of a project why not move the existing processes closer to when the project is launched as a potential trigger. The Finance function could adjust and request the first payment after

a Project manager has been assigned to the project, or after there has been an introductory meeting between the customer and the Project manager.

Mapping processes and sub-processes holds significant value when reassessing the validity of internal practices. Depending on the level of detail in the mapping, it becomes clearer what processes entail. A bigger picture of processes and their relationship to certain stakeholders will assist in understanding its intended purpose. A broad view of processes also allows one to view and assess when, and if there is a more effective time for, processes to occur.

There are multiple benefits to reassessing and placing more focus on the existing processes within a business. A clearer understanding leads to greater insight when addressing the process. This better understanding could also be used to support and motivate the business' employee experiences. By association, motivated employees will result in greater work efficacy and improved customer experiences.

5.5.2 Transparency: a weapon not a shield

Product design relies heavily on the flow and transfer of knowledge across disciplines and functions. This transfer of knowledge is necessary for the successful transdisciplinary design and collaboration on products. Customers are often, if not always, ignorant to the importance and complexities of these inter-relations. They are only aware of the inner workings of a business that the business allows them to see.

Maps are quite simply a form of sense-making (Vizard, 2017:50). This not only applies to the employees and functions involved within a business but can also be aimed towards customers. Currently customers are blissfully unaware of the intricacies and sub-processes involved between their interactions with a service. Therefore delays or unforeseen challenges cause frustration and dissatisfaction with the design-business which results in a poor customer experience. Continued poor customer experience subsequently leads to low customer retention.

If customers are provided with a full skeletal view of a business they could have a better understanding behind delays and challenges in processes. Mager (2013:65) agrees that transparency is essential. She explained that the transparency in services' back-end processes is an increasing need. She added that "not much longer will the backstage be a mystery". This transparency aimed towards customers could also have a greater appreciation and empathy towards work done or not

done. This appreciation and insight into the business could result in the formulation of trust between the business and the customer and eventually lead to customer loyalty and retention.

There is shared benefit to map specific background processes that occur below the “line of visibility” to the customer. Perhaps the solution manifests, to some extent, in communication. Not necessarily what is being communicated but how it is being interpreted. The use of a map has been proven to effectively articulate and communicate intangible inter-dependencies and complexities. Maps offer a potential solution to bridge the disconnect between customers expectation and their experiences. Alternatively maps could also be presented and used as a tool for discussion and create consistency between functions and the customer.

5.6 Conclusion

For Product design to be a long term successful service it is crucial that design-businesses shift their focus towards actively and consciously designing their experiences. The link between customer- employee- and service experiences means that any changes, positive or negative, will have a rippled effect on one another. It is important that design-businesses acknowledge this and design superior experiences as a means of sustained competitive advantage.

In order for design-businesses to design superior experiences it is imperative that there is a full understanding behind processes. This crucial understanding includes but extends beyond the “why” and “how” of each process. It is also important that each process is understood within its greater context. This means understanding how the process contributes towards the customer- and service experience. Only after these processes and associated experiences are understood can they be supported and optimised for employees and functions.

Managing customer expectations needs to become more than a discussion point. Businesses need to acknowledge the relationship and difference between experiences and expectations, and therefore understand that improving customer experiences does not lead to better customer expectation management. There is a need for better communication between the customer and the business. It is less important how often, how quickly or how much content is in communication touchpoints. It is more important to focus on what is being communicated and the impact this has on the customers expectation.

Managing expectations should not be seen as a challenge but rather an opportunity. Businesses need to consider that the solution to managing expectations may not lie in the interactions between a

customer and their front of stage employees. Instead it lies in the backstage processes that support these interactions. It is suggested that businesses shift their focus inwards by vigorously reassessing their internal processes. It is further advised that businesses provide their customers with a fully transparent view of the inner workings of the business. By adjusting, or eliminating, the *line of visibility* customers are made aware of the complexities that occur within the service offering. This improved understanding would diminish frustrations and dissatisfaction and lead to greater appreciation and empathy towards work done or not done.

These motions would require conscious time and strict focus from the business but if conducted correctly will yield positive results. These results would include: improved customer expectations and experiences, enhanced employee experiences, optimised service experiences and increased functional performance.

6 CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

It needs to be acknowledged that offering design as a service is not merely an interaction between a single designer and a customer but is, in reality, far more complex. Various stakeholders, processes and interactions need to operate coherently in order to result in the successful design of a product. In today's ever-developing world, customers seek value from more than a well-designed end product from design-businesses. Instead customers now seek superior service experiences. Businesses have noted the change in value and have subsequently shifted their focus to optimising their experiences offered by their services (Belgeonne et. al, 2017:32).

Studies have identified and proven the direct link between customer experience and employee experience (Chi & Gursoy, 2009:252). Leading businesses and businessmen have also acknowledged and accredited improved employee experience as key to their success (Forbes, 2018). This has resulted in researchers and businesses investing more conscious time and efforts into improving their employee experiences (Berry et. al, 2002:5). It is believed that by association this will lead to enhanced customer experiences and create an overall superior service experience. Duncan, Jones and Rawson (2013:4) further suggest that improved customer and employee experiences will result in long term sustainable financial performance for the business.

In order for businesses to improve the experiences they offer it is essential that they gain a full understanding of how their service is currently being conducted. This is a challenge in its own right as a service comprises of- and relies on- various intangible entities. Both primary and secondary research methods have indicated that Product design as a service is particularly challenging as it is unpredictable and riddled with complexities and incongruities.

With the global focus on services and experiences, a focused design field emerged; Service design. This field of design has continued to evolve as the need for superior services increases. As a result the Service design discipline has developed various mapping tools and techniques to address the challenges faced in transdisciplinary services. These maps have proven to hold significant value and benefits to the employees of a service, the customers of the service and the overall service offering. In applying select mapping techniques, in the form of co-design mapping workshops, the value and benefits of such tools were validated through this study.

In order to ensure that this Chapter remains relevant and comprehensive it has been structured into four main sections, namely; methodological conclusion, service conclusion which reflects on the

original research questions, framework conclusion and an auto-ethnographic conclusion. Through addressing these aspects, this Chapter will discuss how the internal complexities within Product design can be supported through mapping the process as a transdisciplinary service.

6.2 Methodological conclusion

This section focused on the outcomes and conclusions that were generated as a result of the research methods employed throughout the study. Although certain outcomes are unique to this study the benefits are applicable across various disciplines. This section speaks broadly to the methods conducted in this study, most specifically the co-design mapping processes.

In conducting co-design workshops with employees from a single case study, there were numerous beneficial outcomes. The participants of the workshops consisted of employees from varying functions of the case study. This meant that the workshops and mapping involved several perspectives and inputs. The process of mapping allowed the employees to converse and share their views on certain processes, interactions and experiences. The mapping also encouraged discussions around emerging topics and themes.

By using customer-focused mapping techniques in the first two workshops, it meant that participants were forced to change their perspective on their service and view it from the outside-in. This resulted in greater insight and awareness towards the customer, an aligned idea of what a customer should ideally experience with the service (Workshop 1) and an overall better understanding of customers' existing experiences with the service (Workshop 2).

Workshop 3 used the basis of a service blueprint map to place focus on the interactions and processes that currently occur "behind the scenes" in the case study. This refers to the processes and interactions that transpire internally that are not visible to the customer. This mapping process forced participants to focus on the sub-processes and dependencies across functions and various employees within the business. Mapping these dependencies and interactions also provided insight and detail into the magnitude of work and effort that supports the front of stage interactions with the customer.

The service blueprint mapping allowed participants to visually represent and share their view and understanding of existing processes. With multiple inputs on a single map this led to a broader, more informed understanding of the processes. It also initiated discussions around topics that may not have otherwise been addressed by these particular employees if it weren't for the study. These

discussions often alluded to problem areas and, with clearer understanding, developed into solution-based conversations.

Using a single case study could be seen as a limitation as the findings cannot be generalised on a broader level (Yin, 2012:6; Zainal, 2007:5). In addition to this, single case studies are viewed as less certain or confident in their findings in comparison to multiple case studies (Yin, 2012:9). The objective of this study however, was to map the existing activities within Product design as a complex transdisciplinary service. The scope of the study was not to identify generalised problems within the service or suggest solutions to address said problems. Instead the suggested solution-based outcomes are seen as an added benefit to the Service design mapping tools utilised.

The overall process of mapping, regardless of which map was used and what the focus was, encouraged employees to collaborate and discuss their service from various points of view. This resulted in a number of benefits specific to the case study as well as to the greater industry of Product design as a transdisciplinary service.

6.3 Service conclusion

6.3.1 What are customers typically experiencing when subjected to Product design as a service and how does this impact their expectation of the service?

Literature has indicated that a customer's experience with a service plays a fundamental role in determining their preference and subsequently their purchase decisions (Gentile, Noci & Spiller, 2007:396). Workshop 2 allowed participants to map detail around the existing customer experiences in order to gain insight into current experiences encountered through the service. Literature and findings suggest that a major factor contributing to the customer experience with Product design as a service is customer expectation. In Workshop 1 the participants identified and agreed that the step "managing (customer) expectations" was the biggest challenge in providing an ideal design service.

Both literature sources and findings reported multiple discussions around "managing" and "setting" expectations and the significance it holds for businesses. Yet after all these explorations and discussions very little is being done to actively manage customers' expectations. Instead businesses, consciously or sub-consciously, are investing their focus on improving customer experiences. This may be as a result of a lack of definition of the terms and their relationship or an assumption that the terms are synonymous.

Thus it must be stated that addressing the challenge of managing customer expectations will have a positive impact on the customer experience. But the inverse does not apply. Customer expectations are an obstacle that contributes towards a customer's experience with a service. Improving the customer experience however will not result in better management of their expectations.

For example, there is a common misconception that increased communication will result in better managed customer expectations. Currently the main communication method aimed at managing customer expectations within the case study is performed when the Project managers send weekly emails to report on the progress of the project. It is hoped that diminishing the delays in responses, increasing frequency of communication and including more detail into points of contact will lead to better expectation management. These may effectively improve certain aspects of the customer experience; it does not mean that what is being communicated better manages their expectations. This was supported by PC-W01 in Workshop 1 who stated that: "constant feedback to the customer does not mean expectations are managed."

Therefore addressing delays, increasing the frequency of communication and including more detail into weekly emails would simply mean that the customer's expectations will still be missed and they will be made aware of it sooner, more frequently and in greater detail.

The topic of customer communication was explored through literature. Sherwin (2012:10) explained that any communication with the customer has a significant influence on their satisfaction levels. He added that it is not only important to ensure that communication is precise and efficient but it should also be frequent and of high quality as this helps to create a high perception of value for the service. Duncan, Rawson and Jones' study on customer satisfaction (2013) contradicted this as their study found that giving customers too much information led to confusion and further customer dissatisfaction. In their study, customers expressed frustration during key moments in a service offering, even if operationally, there were no issues. The case study was found to invest a significant amount of time and effort into frequent communication to customers. In Workshop 3, the Project managers discussed how they each receive different feedback, if any, from the customers that are sent regular updates. Literature and findings therefore suggest that the main challenge to address customer communication is subjectivity as there are various factors that influence each customer's experience with a service.

The study suggests that perhaps more needs to be done to prepare customers before engaging in the service. More specifically in pre-service interactions, as this is where the case study agreed most

expectations are set. There is a need to inform customers of what to expect from their experience with Product design as a service, this includes the challenges and complexities in the industry as well as the result this has on accurately managing expectations.

Duncan, Jones and Rawson (2013:6) explain that the root causes of poor customer expectations, more often than not, stem from inside a business and is predominantly caused as a result of cross-functional disconnects. Instead of focusing on the interactions between the customer and the front of stage employees, it is suggested that businesses should adopt a more inward facing approach. The key to managing expectations may be found within the backstage interactions that customers are unaware of.

Once the mapping of existing processes and experiences had been completed it was made clear that customers are only aware of the service activities that they are subjected to. Therefore anything that was mapped below the "line of visibility" on the service blueprint map is not apparent to the customer. This includes majority of the processes and dependencies necessary for the successful transfer of information. This is supported by ID-W01 who stated that:
"most interactions with the customer are just emails yet there is so much work and so many people involved behind the scenes to create the content for those emails." (ID-W01)

Consequently, customers are unaware of the intricacies and sub-processes involved between their interactions with the service. As a result, delays or unforeseen challenges cause frustration and dissatisfaction with the service which results in a poor customer experience.

Managing customer expectations is particularly challenging to address as no customer or product is the same. Through literature and discussions held in co-design workshops it was suggested that the best means to manage customer expectations is to shift the business's focus inwards to the practices and processes conducted within the service, especially those that occur backstage.

In summary, based on the findings and outcomes of this study focused on what customers are typically experiencing in design as a service, recommendations for design consultancies are as follows:

- Place more focused efforts on not only managing customers' expectations but also what and how their expectations are being set.
- Do not attempt to address customer expectation through improved customer experiences.

- Put more emphasis on what is being communicated to the customer rather than how much or how often they are communicated with.
- Consider the processes and interactions that occur behind the scenes of the service and their impact on the customer expectation.
- No customer or project is the same therefore there is no single answer to accurately set or manage expectations.

6.3.2 What practices and processes currently exist within the transdisciplinary Product design process?

The literature in this study explored the context by "understanding Product design". This section expanded on what Product design entails, who it involves and how it is conducted as a service. Findings from the case study verified that the greater part of "understanding Product design" is accurate to current world workings.

For example, literature sources indicated how Product design is closely located between the fields of Engineering design and Industrial design (Kim & Lee, 2010: 1795). This is validated by the design function of the case study consisting of various Engineers and Industrial design employees. The literature presented the various functions involved in Product design as a service from the "core team" to the "extended team" (Eppinger & Ulrich, 2012:4). It added that each function, although not all actively involved in the design of the product, has a role to play in the implementation of the service (ibid). This was supported through direct observations, contextual interviews with employees and detailed mapping of the existing processes and procedures of different functions within the case study.

When looking at Product design as a process, literature sources acknowledged that every Product design business employs a process that is slightly different from the other; this is to accommodate the business' unique characteristics. The literature covered two main approaches. Eppinger and Ulrich (2012:13) indicated that the process consists of 6 iterative phases. They add that the phases continuously build on the phases that precede it. Whereas Bernard (2013) adapted a five phase process from Pahl and Beitz (1988), who saw the process in terms of knowledge representation. It was found that the case study adopts a Product design process that is unique to its strategy but borrows from both approaches. The case study uses a five-phased process, namely Discovery phase, Experimental prototype, Alpha prototype, Beta prototype and Manufacture. These phases build on the outputs of their preceding phases. The outputs and knowledge acquired through each phase also

varies in how it is represented. For example the “Discovery” phase is a report-based outcome and “Alpha prototype” involves CAD, technical drawings and a physical product.

Literature briefly explored three main challenges experienced in Product design. Two of these challenges included (1) the immense pressures to deliver superior end products and (2) the successful transfer of knowledge and information within transdisciplinary functions (Bernard et al., 2013:205). It was mentioned that designers are placed under great pressure to deliver products with a faster turnaround time and a lower margin for error. This challenge was validated through the study’s findings as Project managers in co-design workshops discussed recent encounters with dissatisfied customers who complained about delayed responses and deadlines. The transfer of information and knowledge across functions was also found to be a challenge in the real world workings of design as a service. This was evident when employees from various functions misunderstood common terms used by other functions of the service. In Workshop 1 for example, EN-W01 required a definition of the term “decisive competitive edge”, a term frequently communicated to customers by the Business development function in pre-service interactions.
Being aware of the intricate context of Product design as well as acknowledging the main challenges experienced contributed towards a deeper understanding behind the complexities that were made evident in the mapped outcomes. Findings from the maps generated from co-design workshops and observations conducted in this study support the statements made by literature sources regarding the challenging nature of Product design as a service. The findings validated and elaborated that in reality there are numerous stakeholders, misaligned backstage processes, interactions, dependencies and disconnects across the various disciplines and functions of a design-business.

Eppinger and Ulrich (2012:2) emphasise that these entities need to build towards creating a superior design service. The service blueprint mapping made it evident that customers are ignorant to majority of the complexities within the transdisciplinary service. More specifically they are unaware of the amount of work, dependencies and interactions that contribute towards their experience with the service and subsequently required to manage their expectations accurately.

Based on the outcomes of this study aimed at the practices and processes that currently exist I Product design it is recommended that design consultancies:

- Acknowledge that Product design consists of various stakeholders from various backgrounds and professions and therefore communicate and interpret information differently. This leaves room for possible misalignment or miscommunication.

- Create a means of clear and effective communication between stakeholders that does not solely rely on the transfer and interpretation of information verbally.
- Accept that no Product design process or approach is the same. Instead it is important that the process is suited to each unique design consultancy.
- Empathise that customers are unaware of many of the internal processes and dependencies within the service that often lead to delays or frustrations.

6.3.3 What are the complexities in the Product design process, when mapped internally from a service perspective?

As previously mentioned (section 6.3.2), literature briefly explored three main challenges in Product design, two were addressed in the preceding section with the third challenge involving planning and managing processes both internally and externally.

The literature had covered two cases to demonstrate the significance behind creating coherent service experiences. It presented the case of Apple's superior products, services and experiences (Meyer & Schwager, 2007:3) versus a television service provider (Duncan et al., 2013:7). It was identified that if practices and processes are misaligned there is a negative impact on employees, the customer and the service suffers as a result. In the example of the television service provider, the employees involved in disconnected processes expressed frustration. Duncan, Jones and Rawson added that this disconnect was also apparent to customers who were dissatisfied with the service. Findings from the study accumulated through observations, co-design mapping workshops and informal interviews with stakeholders further justified the significance of this point in existing experiences. Upon discussing the disconnect across the various functions in the case study (Workshop 3), COO explained it as functions are "operating as islands". It was also expressed by the participants of Workshop 3 that the internal disconnect led to dissatisfied customer experiences.

The literature used in this study continuously states the importance of processes in Product design and how they need to operate succinctly in order to result in a successful product. Accumulated findings in the case study found that employees do not fully understand their role and responsibility within a service, nor do they completely understand others' roles. It was identified that in some instances employees know "what" a process entails but there is a misunderstanding in "why" it is necessary. And in other cases employees understand the purpose behind a process but do not understand "what" the process entails. In some extreme cases employees were also found to be completely oblivious to processes of other functions.

In order to optimally perform a role within a process an employee, whether they are frontstage or backstage, needs to understand what the process entails and why it is relevant to the service. If the purpose behind a process is not understood the process will occur as it should but it will not fulfil its intended purpose. This could also lead to situations of internal miscommunication and frustration. This was evident from the case study when COO-W02 expressed his frustration around the "Handover to Operations" sub-process only for CEO-W01 to clarify the misunderstood intention of the process. There is a similar implication if the steps of a process are not known but the the purpose of a process is. In Workshop 3 (which involved the CEO, COO and all the Project managers) knew there was a "loads project" sub-process however none could elaborate on what the process entails. The lack of complete understanding in processes results in dependencies, bottlenecks and delays in the service. This in turn leads to functions operating independently and causes negative customer- and service experiences.

Literature and discussions within the workshops found that in order to enhance service experiences it is necessary to gain complete understanding towards employees and their challenging work environment. Literature strongly suggests that businesses need to support its employees. This support would help employees cope with the rapidly changing environment and support their ability to enjoy their work and what they do (de Belgeonne et al., 2017:33). Once managers or supervisory roles have the best possible understanding they can address both the customer and employee experiences with insight.

Therefore understanding processes and roles are key to employee performance as well as the successful implementation of the service. How can employees and functions operate optimally if they do not have a complete understanding of what and why they perform certain activities? Beyond this, how can businesses and employees support one another if they are ignorant to each other's workings and their role in the service offering?

Overall, the mapped outcome provided multiple benefits for the employees of the service. These benefits apply to each individual employee, various functions of the service and the employees and functions relative to one another. Through the process of mapping, the individual employee gained significant insight into their role within the service. More importantly they could better understand the greater implications their role and responsibility has on the customer- and service experience. Having collaborated on a mapping, employees now have a greater appreciation and deeper understanding into not only their working context but also those that surround them. Not only did the mapped outcome provide a significantly greater understanding of the complexities, it also

identified gaps and disconnects within the service. This led to further understanding and empathy towards the customer and their experiences, more specifically the frustrations expressed by customers.

Through literature sources and findings from the study, mapping was found to be beneficial to various stakeholders through creating a complete understanding for previously intangible complexities. But there has to be more that can be done with this newly acquired understanding. Through analysis and evaluation of the outcomes of this study, two approaches were presented.

Firstly, it needs to be acknowledged that processes are put in place to serve a particular purpose. These processes are implemented on a regular basis and are seldom re-evaluated for their fit and purpose to the business. With the new shift in focus on enhancing experiences within a service, it is necessary for businesses to reassess their current internal processes and their impact on the service offering. The act of reassessing would require businesses to investigate and question the “what”, “why” and “when” elements of their processes. In order to optimise a process a business needs to have a holistic understanding of each process in context. This broad view understanding is provided by the mappings. This not only creates a better understanding but also means that each process can be optimised from a more informed perspective.

Secondly, it was noted by Mager (2013:65) and PM-W01 (in Workshop 3) that transparency of internal processes may be key to addressing poorly managed customer expectations. The service blueprint mapping proves that customers are unaware of majority of the complexities involved in Product design. Therefore providing customers with a skeletal view of the internal workings of the service could provide them with the insight they require for expectations of the service.

In summary, this study provided the service provider with a concise mapping of the processes and sub-processes involved from the customer interactions with the business to the dependencies and interactions that occur internally. This includes the relationship between the back- and front of stage employee interactions. The case study can now better understand the frustration expressed by customers with regard to poor- or delayed communication. The case study is now also equipped to address issues directly by observing which functions and employees are involved and re-assess these sub-processes and dependencies. Skeg now has greater insight into their service and, going forward, can attempt to mitigate challenges from an insightful and informed perspective.

When dealing with the inevitable complexities in Product design, the findings of this study suggests design consultancies:

- Identify when employees or functions are operating in isolation as this creates gaps in the service experience
- Insure that employees and functions understand not only what or how to perform tasks but also why they are necessary.
- Gain a complete understanding and support employees to not only perform optimally but also enjoy their work. Happy employees are key to happy customers.
- Be transparent with customers. Share the inner challenges and complexities of Product design. That way the customers are better informed and can set their own expectations to be more realistic.

6.4 Framework conclusion

The decision to explore Service design as a conceptual framework proved most beneficial to this particular study as it offered numerous tools and techniques to not only document and report the process in the form of various maps, but also assisted in the interpretation and understanding of the mapped outcomes. The Service design tools and techniques used in this study are predominantly used for services to shift their focus to be more customer-centric. This study utilised both the customer journey and service blueprint map to place focus on the customer. It also used the customer experience as a foundation and focus on the internal processes, dependencies and interactions that support and impact the customer experience.

The Service design industry has been found to possess significant value in representing, understanding and addressing intangible entities. In this study, it allowed participants from various functions to collaborate comfortably and effectively. It forced employees to change their perspective in order to gain insight and gather a holistic understanding of the service offering. It also resulted in productive cross-discipline discussions. These discussions not only identified challenges, gaps and misalignments but ultimately identified a number of opportunities within the service offering. For example discussions in Workshop 2 led to the Business development function and Project managers agreeing that it may be necessary for a Business development employee to be present in the “Intro meeting” between the Project manager and the customer. In Workshop 3 PM-W01 had suggested combining existing SOP (standard operating procedure) documents with the mapped outcome with labels and numbers as a means to address employees not fully understanding certain processes in the service.

Service design holds substantial value for businesses and services alike. The unique approach adopted by Service design and its tools and techniques has proven benefits for the customer- the employee and the over-arching service. The mapping conducted in Workshop 1 and 2 insured that there is greater awareness and emphasis on the customer and their experiences with the service. The maps were also found to be an effective platform for discussions between employees and across functions. Participants of the workshops had expressed how, even though they were aware of how things work in the business, the mapping clarified and built on their understanding (PM-W01 and CEO-W01). Through collaborative evaluation of the mapped outcomes of the study, participants held discussions around various means of improving the service experience, such as automating simpler internal processes in order to mitigate internal delays and dependencies thus diminish customer frustrations.

6.5 Auto-ethnographic conclusion

Throughout this study I, as the researcher, learnt that every interaction and experience, whether internal or external, holds value. Each interaction varies and is subjective according to who is involved and the purpose behind the interaction. Effective communication, although seemingly simple, is difficult to achieve. The use of simple, tangible methods (such as post-it notes for crude mapping) enhances not only communication but also clearer interpretation and understanding.

This study revealed that nothing is ever as simple as it may appear. It also taught me that every interaction, no matter how big or small, should not be underestimated. It just takes one poor encounter to change ones perception or motivation towards a service.

6.5.1 What did I learn about the Product design industry?

Being an Industrial designer by profession and having first-hand experience of the inner workings of Product design as a service, I was made aware that it is a complex and challenging world in which to operate. It is undeniable that Product design, and invariably any transdisciplinary service, is complex. This study and the subsequent outcomes revealed the magnitude of such complexities as well as challenges and their implications on the service as a whole. The truth is that Product design, notably in the innovation space, is unpredictable and lined with unknowns. Therefore it is not surprising that managing customer expectations is a major challenge. It is highly likely that this will remain a major challenge and focus point for the Product design industry.

This study has broadened my understanding of the context and I can now better relate to a quote by Einstein where he said he would spend 55 minutes understanding a problem before attempting to

solve it. With so many “unseen” challenges it is crucial to fully understand the “problem”. Only once this has been achieved can one successfully go about designing the best possible solution. A clearer understanding may even reveal a bigger, more fundamental problem, or it could suggest a simpler solution.

6.5.2 How do I feel about Service design moving forward?

I am excited by the prospects of Service design and the vast benefits it offers. There is proven significant and value in Service design for all stakeholders and service entities that I believe is severely under-acknowledged and under-valued.

Whether purposefully designed or not, the design of services has an impact on us on a daily basis; whether it is at ones work place, during a regular trip to the grocery store or a scheduled doctor’s appointment. We, as modern day customers, have developed high expectations for services and are often left disappointed. Unfortunately society typically only identifies bad service experiences and seldom acknowledges a great service experience to the same extent. This should drive and justify the need for Service design.

As the service sector continues to grow and develop I hope to build on my knowledge, skills and understanding of services and the design thereof. In growing alongside Service design I hope to one day be an ambassador and pioneer in this highly influential and valuable field.

6.6 Recommendations

After having completed this study there are a number of recommendations suggested for any future exploration into this area of study. Whether it is Product design specifically or any transdisciplinary service offering it is believed that co-design mapping through the use of Service design tools and techniques holds substantial and proven benefits. One recommendation would be to involve customers in the co-design mapping process, either with the employees of the business or independently. This will ensure that the customer’s perspective is captured and represented as accurately as possible instead of resulting from assumptions of the employees of the service.

Another recommendation would be to involve as many functions of a business in the mapping process as possible. Too many participants could quickly become difficult to manage in a workshop environment but it is believed that including more functions would result in a more holistic mapping of the internal processes as opposed to being predominantly based on one or two main functions.

For example, the Financial function of the case study would have had a unique contribution to the mapping that may not have been identified by the Operations function or Project managers.

In concluding the mapping exercise, it would also be strongly suggested to present the final map to the employees of the service. Whether it is a process relevant to them or not it would provide insight and appreciation into other functions and employees roles within the service. This would also mean employees can have greater empathy and better support one another in their complex daily working environment.

It is recommended that further exploration and research should be completed in this industry as it is found to be more complex than expected. This study made use of a single case-study in order to map the current real world workings of Product design as a service. Skeg Product design is a leader in it industry but is by no means the only service provider of Product design as a service. Therefore it comes highly recommended to map existing experiences and processes within other Product design services as this would provide findings to either support or contradict the findings of this study. This would lead to a more accurate understanding and representation of the industry of Product design as a transdisciplinary service.

And finally, Service design has presented various benefits to enhance understanding, communicating and ultimately the act of designing. It is therefore strongly suggested that Service design be included in more design-courses and education. It is believed that design professions such as Industrial design, Graphic design and Engineering design would benefit substantially from the theories, tools and techniques offered by Service design.

6.7 Conclusion

Product design as a transdisciplinary service is highly complex. Offering Product design as a superior service means that focus needs to be placed on enhancing customer- and employee experiences. Customer experiences are enhanced through the challenging task of managing expectations in an unpredictable industry. This is done most effectively through quality communication between the stakeholders. Enhancing employee experiences is similarly achieved through quality communication, clearer understanding and offering support.

Through a detailed mapping process there are numerous opportunities for development and improvement in delivering the complex transdisciplinary service of Product design. Gaining the best possible understanding, from all points of view, is the first crucial step to address the service

experience. Mapped outcomes provide an effective means of in-depth understanding, insight and a platform for productive discussion and should continue to develop and grow alongside services.

Quite simply, if we do not understand what we do or why we do things we cannot do it better, faster or more cost effectively. There are various benefits in the mapping process and subsequent mapped outcome of such a complex service ranging from internal to external benefits to the service provider. These benefits extend beyond the case study to include the greater industry of Product design as well as the highly valuable field of Service design.

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Appendices Document

Mapping Product design as a transdisciplinary service

8.1 APPENDIX A:

Breakdown of study aims and objectives presented to Skeg

MTech Thesis Breakdown & Objectives

2016/2017

Completed by: Jess Kuhlenthal

Introduction

It must be stated that this thesis and subsequent research will be used solely for academic purposes and all data and findings will be treated with the utmost respect in terms of ethics and consent.

This MTech thesis is being supervised and co-supervised by Vikki Du Preez and Veronica Barnes respectively. Both supervisors are fully aware of the research and its intentions and can be contacted at any time if there are any academic related queries or questions.

Supervisor: Vikki du Preez

Cape Peninsula University of Technology, South Africa

E-mail: dupreezv@cput.ac.za

Co-Supervisor: Veronica Barnes

Cape Peninsula University of Technology, South Africa

E-mail: barnesv@cput.ac.za

What is Service Design?

Service Design, also known as SERVD, is the application of a range of design tools that are used to identify, define and optimise systems, touchpoints, people's roles and the ecologies that deliver innovative services (Fossick, 2016).

Service Design is further defined as an inter-disciplinary technique for applying resources and time more efficiently without diminishing the quality of a service. The basis of Service Design as a process boils down to five key principles; it is user-centred, sequential, qualitative, iterative and holistic (Thoelen & Cleeren, 2015:7).

Services are process- and experience- based and in many cases they are also dependent on interpersonal delivery systems. The design of services thus has a strong focus on process, delivery and experience (Bitner, Ostrom & Morgan, 2007:2). Service Design, in particular, can be used to design entirely new services or to improve existing services. It is also used to align processes with the users of a service, and to optimise user experiences or encounters with a service (Design Council, 2016: 4).

Due to rapid developments in the field of Information Technology there has been a drastic change in customer needs and preferences. It is said that owing to this shift "the effective design of service systems will become even more important in the coming years". It is also suggested that creating desired customer experiences is becoming a highly influential competitive advantage for businesses (Davis, Fitzsimmons, Heineke & Verma, 2002:117). A customer's experience is dictated by 3 main areas of focus as seen in the following diagram.

Figure 1: Customer Experience

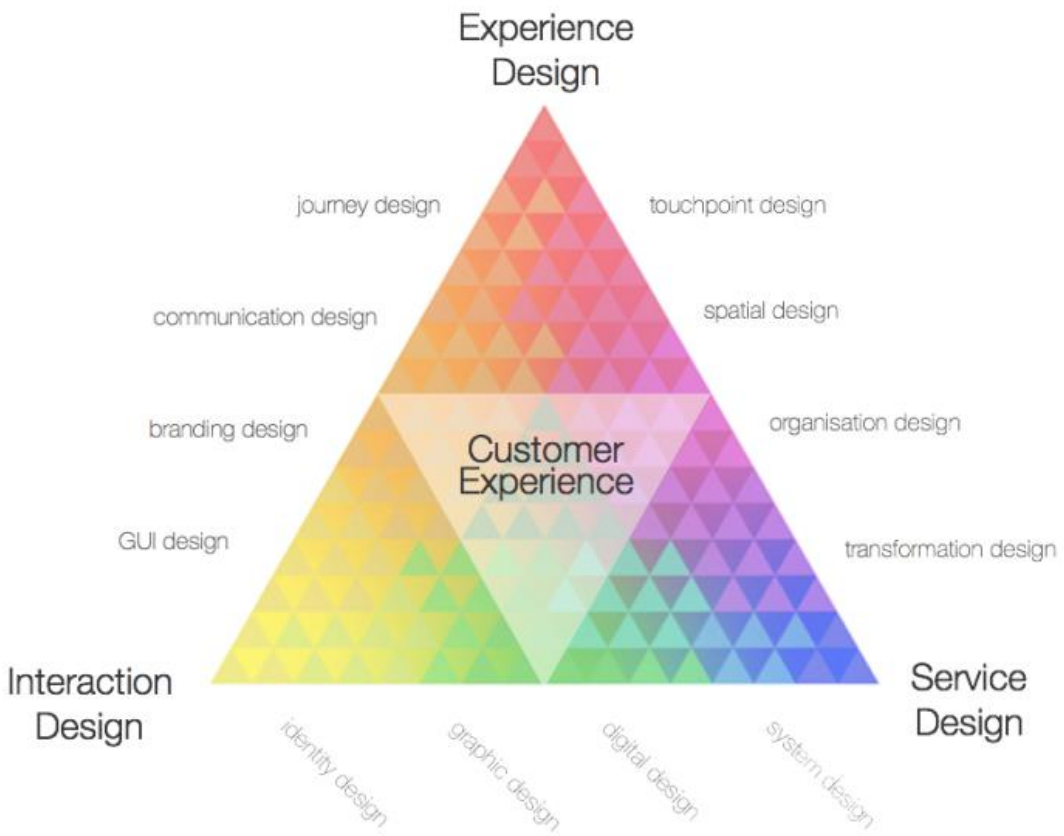

Image from: Fossick, P. 2016. *Service Design in Venture-as-a-Service*. [Online]. Available: https://peterfossick.co/2016/01/08/service-design-as-venture-as-a-service/ .[18 November 2016].

It is thus not surprising that the world is currently shifting from a product-dominant industry to a service-dominant industry (Fossick, 2016). Even large companies such as IBM, SAP and General Electric currently generate a greater financial income from services than from their products (Bitner, Ostrom & Morgan, 2007:2).

Background to Topic

Design is a highly complex process with various stakeholders, systems and interactions that need to work coherently in order to result in a successful design or product. It needs to be acknowledged that offering design as a service is not simply an interaction between the client and a single designer; but in reality is far more complex and detailed.

What is the Problem?

Design as a process currently looks outwards, this means that it looks at how users engage with the final service or artefact. User-centred tools and considerations such as feasibility and viability in design are traditionally used to explore the relationship between the final artefact and client or user. This is only one side of the story of design. The design process in practice draws a number of different professions together and the iterative nature can create challenges to deliver on deadline and within budget.

Before one can reflect on these constructs, a more detailed map of design as a service is required. Beyond a model of process, which highlights phases, a detailed blueprint of the complexity of design as a service can identify operational challenges and opportunities within a design organisation and the design experience as a transdisciplinary network of engagement.

Albert Einstein once said, “If you can’t explain it simply, you don’t understand it well enough”. Building on this, it is important to note the importance of a complete understanding of a context if there are to be any changes or progression within that context.

With regard to design as a service, the act of design is already a complex process: which is challenging to define, as most elements in a service are intangible, but design specifically revolves around so many disciplines and professions that it is difficult to track. It is for these reasons that my research topic is as follows:

Mapping Product Design as a transdisciplinary Service: an Activity Theory approach.

The Value of this Topic

In mapping the act of 'design as a service' it will make the intangible tangible. The Service Design field has a variety of tools for representing services in degrees of detail and depth and from a range of perspectives. The use of Activity Theory as a Theoretical Framework will optimise this mapping process.

In having a complete mapped out service, connections and the flow of processes become very clear. It also enables one to easily view the possible implications of a change or adjustment within the service.

A mapped system of a service also adds clarity and coherency within a service. It is useful to all members of a design business as they can effectively interpret and understand their role in providing the service. An employee in the design field could then have a better understanding of the complex context in which they operate and can perform the act of 'designing' better. After all, a service is essentially a chain of events and resources that add value to the end user of the service and therefore relies heavily on the consistency within that chain.

In mapping an entire process and sub-processes it is also possible that information such as bottlenecks, friction points or even unnecessary processes can be identified and subsequently addressed.

Who is it aimed at?

As previously mentioned this thesis will help the design industry understand its own practice better. The outcomes will be relevant for any individual, business or employee involved in the design industry. This could be the owner of a design consultancy to an individual in the design field or a group of designers collaborating on a project. It could be anyone that has a role in delivering design as a service who could benefit from a holistic understanding of the context in which they work or someone who may want to suggest adjustments or changes to improve the service process of design. This topic emphasizes that design is a transdisciplinary field thus helping to identify all stakeholders in the design process be they engineers, project managers, business specialists or technologist and so forth.

Outcomes and Objectives

The main outcome of this thesis will be a complete mapped process of design as a service, from pre-service to post-service encounters: both within a business and between a business and its clients. It will include the touchpoints, systems, processes, relevant stakeholders and interactions involved in delivering the service.

The mapping process will be completed using various methods lending from Service Design tools such as Service Blueprints, User Journeys and Personas. This information would then be accumulated and analysed through Activity Theory to further map the processes and to view a process from various perspectives.

The numerous mapped processes will be tangible and based on real-world cases and scenarios. It is hoped that in developing these maps and diagrams that the service will be better understood in its entirety and any issues or friction points could be identified and addressed in an informed manner.

The final outcome of this thesis may be the mapped process, but could also include guidelines or recommendations depending on the findings from the data.

Where does Skeg fit in?

Skeg is a Product Development company based in Cape Town that offers its customers various services ranging from discovery research reports to design and prototyping through to full manufacture. As a business it has the unique capability and capacity to turn a customer's virtual idea into a product all under one roof. Skeg consists of a very experienced, highly skilful team of Industrial Designers, Engineers (Electrical and Mechanical), Model makers and Production staff.

Skeg essentially offers design and manufacturing or prototyping as a service with design being the fundamental focus of the business. The design work is not limited to only the Industrial Designers but extends to include the Electronic and Mechanical Engineers. As Skeg's working style is a collaboration between designers from various disciplines, it is an ideal case study for this thesis and there is merit in the possible outcomes of this thesis to benefit the company.

A joined venture between this thesis and its research and Skeg is mutually beneficial and offers a unique opportunity to exploit an underexplored area of focus.

What would I need from Skeg?

- Access to relevant service process and system information (by request and permission only)
- 3 Collaborative Co-Design Sessions with Management Personnel (Project Managers, General Manager, Owner) with a duration of 1 hour each.
- 5 Informal Interviews with either Management or relevant Resources with a duration of 1 hour each.
- Opportunity to document and record observations and experiences

This list's sole purpose it to give an indication of what can be expected during the data collection phase of the thesis but all final research activities will be conducted at the discretion and convenience of the company.

In return, I will ensure that Skeg is up-to-date on research and work being conducted and will ensure a transparent relationship throughout the process. Any changes or plans that may influence Skeg in any way will be communicated well in advance to avoid any inconvenience or miscommunication. All work will be made available for review to ensure there is no breach of any intellectual property in terms of Skeg's internal systems and processes or those of any of Skeg's clients. There is no plan to include or involve any of Skeg's clients in the research process.

Skeg has the option to be referred to by name in the thesis (as Skeg Product Development) or to remain anonymous in the document, in which case will be referred to as "a Product Development Company".

Important dates for the year to come such as Proposal Defence and other necessary deadlines will be presented and communicated to Skeg in advance and will be dealt with and managed accordingly.

Please refer to the attached consent form and feel free to communicate any queries or questions.

List of References

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Cape Peninsula
University of Technology

Introductory letter for the collection of research data

Ms. Jessica Courtney Kuhlenthal is registered for the MTech Design degree at CPUT (*Student number:* 212004891). The thesis is titled:

Mapping Product Design as a transdisciplinary Service: an Activity Theory approach.

The supervisors for this research are:

Supervisor: **Vikki du Preez**
Cape Peninsula University of Technology, South Africa
E-mail: dupreezv@cput.ac.za

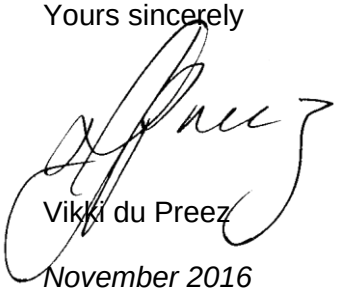
Co-Supervisor: **Veronica Barnes**
Cape Peninsula University of Technology, South Africa
E-mail: barnesv@cput.ac.za

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data.

If you agree to this, you are requested to complete the attached form (an electronic version will be made available to you if you so desire) and print it on your organisation's letterhead.

For further clarification on this matter please contact either the supervisor(s) identified above, or the Faculty Research Ethics Committee secretary (Ms V Naidoo) at 021 469 1012 or naidoove@cput.ac.za.

Yours sincerely



Vikki du Preez

November 2016

Full Name: _____

Name of organisation: _____

Position in organisation: _____

I give consent, in principle, to allow Ms. Jessica Courtney Kuhlenthal (student number: 212004891) a student at the Cape Peninsula University of Technology, to collect data in this organisation as part of her M Tech (Service Design) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member, or resident to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the organisation's name may or may not be used in academic dissemination as indicated below (Tick as appropriate.)

	Thesis	**Conference paper**	**Journal article**	**Research poster**
Yes				
No				

Full Name: _____

Date: _____

Signature: _____

8.2 APPENDIX B:

Signed consent form from case study (Skeg)

Skeg
Product Development

Full Name: Johann Malherbe

Name of organisation: Skeg Product Development

Position in organisation: General Manager

I give consent, in principle, to allow Ms. Jessica Courtney Kuhlenthal (student number: 212004891) a student at the Cape Peninsula University of Technology, to collect data in this organisation as part of her M Tech (Service Design) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member, or resident to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the organisation's name may or may not be used in academic dissemination as indicated below (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓	✓	✓
No				

Full Name: Johann Malherbe

Date: 12/01/2017

Signature:

7 Marconi Road | Montague Gardens | 7441 | South Africa
Tel: +27 (0) 21 551 1441 | Fax: +27 (0) 21 552 9618
www.skeg.com

8.3 APPENDIX C:

Workshop 1 Delineation workshop presentation

Cape Peninsula University of Technology

Mapping product design as a transdisciplinary service.

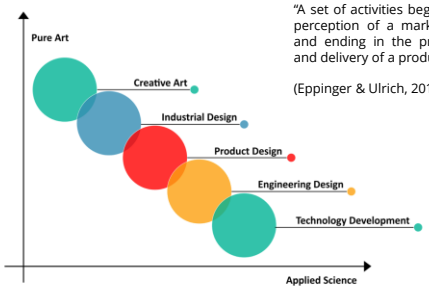
Delineation Co-Design Workshop

Presented by: Jess Kühlenthal
Supervisor: Vikki Eriksson (Du Preez)
Co-supervisor: Veronica Barnes
Case study: Skeg Product Development
January 2018

AGENDA

1. **THE PURPOSE**
   Why are you here?
2. **UNDERSTANDING THE CONTEXT**
   Background to my research topic
3. **THE RESEARCH OBJECTIVES**
   Who benefits?
4. **BREAKDOWN OF RESEARCH**
   How and why?

2. UNDERSTANDING THE CONTEXT
What is product design?

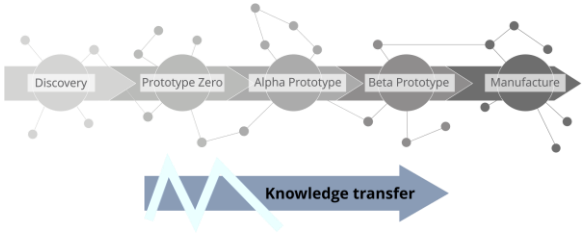


"A set of activities beginning with the perception of a market opportunity and ending in the production, sale, and delivery of a product."

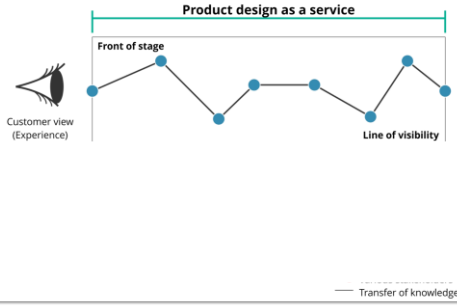
(Eppinger & Ulrich, 2012:2).

2. UNDERSTANDING THE CONTEXT
Who is involved in product design?

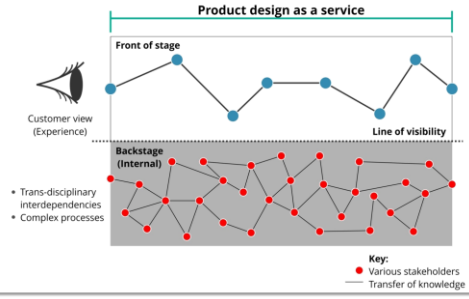
2. UNDERSTANDING THE CONTEXT
How is product design offered as a service?



2. UNDERSTANDING THE CONTEXT
The customer experience



2. UNDERSTANDING THE CONTEXT
The customer experience



Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.

3. THE RESEARCH OBJECTIVES
The value of visualization

"Visualization **helps people think and communicate**. In the information-rich environments of business, access to knowledge is rarely the main challenge. What consumes time, effort, and brainpower is **making ideas simple and understandable.** "

(Brand Flu, Lovlie and Reason , 2016:10)

Simply put, if we do not understand **what we do** or **why we do things** we cannot do it better, faster or cheaper.

3. THE RESEARCH OBJECTIVES
Who benefits?

Organization:
Skeg

Stakeholders
within Skeg

Skeg
Customers

4. BREAKDOWN OF RESEARCH
How and why?

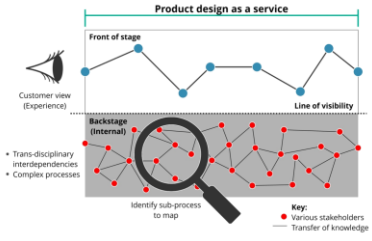
Phase One:
Delineation

Phase Two:
User Mapping

Phase Three:
Service Blueprint

4. BREAKDOWN OF RESEARCH
How and why?

Phase One:
Delineation



4. BREAKDOWN OF RESEARCH
Delineation Workshop

4. BREAKDOWN OF RESEARCH
Delineation Workshop

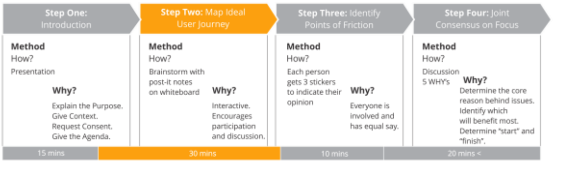
4. BREAKDOWN OF RESEARCH
Delineation Workshop

Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.

Cape Peninsula University of Technology

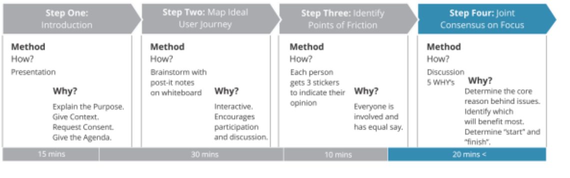
Thank you for your time.
Are there any questions?
Do I have your consent to take part?

Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.



Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.

Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.

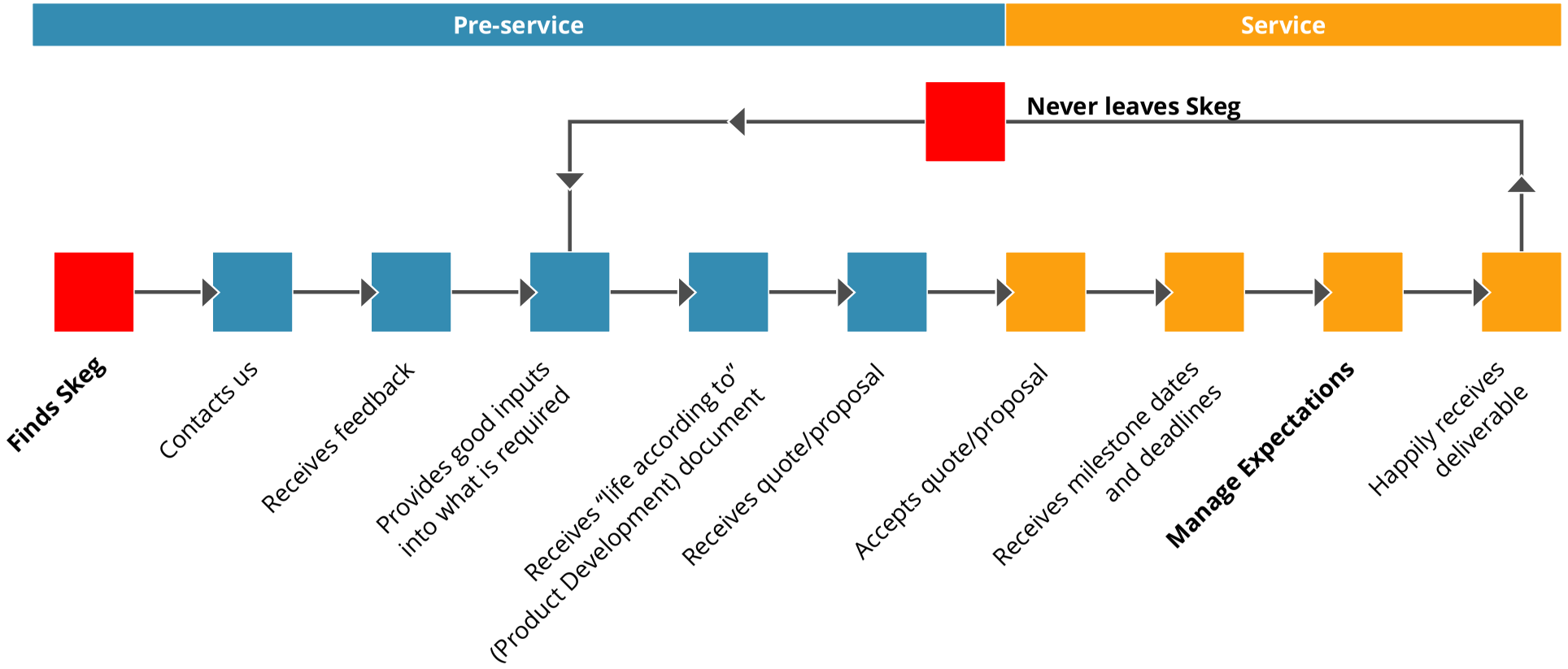


Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.

8.4 APPENDIX D:

Workshop 1 mapped outcome: Skeg's ideal customer journey

Ideal Skeg Customer Journey



8.5 APPENDIX E:
Participant feedback from workshop 1

Participants' feedback on workshop 1: Delineation

Hi everyone,

I just want to take this opportunity to say a massive thank you again for giving me some of your time on Tuesday for my Delineation workshop, it really is highly appreciated.

If you don't mind, would you please spend 5 minutes sharing your input with me so that I can build and improve for my next workshop.

- Can you please explain your experience of the workshop as a whole (This can be anything between 1 and 50 words max)
  It was good. I felt involved. I got to see what other people in the organization's perspective is on how our clients experience their journey with us.

- What did you like about the workshop?
  It allowed me to put on a different thinking cap, that of the client. The workshop made what we perceive our client issues are visual and tangible. We can use this to focus our efforts to improve our customer's experience.

- What did you dislike about the workshop? What can be improved on?
  Nothing in particular.

- Any comments or suggestions moving forward:
  Maybe we could have built our model by using two or three key client's experience as an example. It would take a lot of prep work to work through the histories though.

There is no rush for this but whenever you feel like your mind needs a break from your hard work;)

Thank you so much and have an awesome weekend!

Kind regards,

Jess Kühlenthal | Industrial Designer
Skeg Product Development
7 Marconi Road | Montague Gardens | 7441 | South Africa
T: + 27 (0)21 551 1441| | **F:** +27 (0)21 552 9618 | **E:** jess@skeg.com | **W:** www.skeg.com

Feedback from: PM-W01

The Good: - Effort Spent in preparation for the meeting
Specifically, the presentation and agenda that was created.
- The fact that we actually ended up identifying a problem within Skeg, means you are definitely on the right path. We may even have discussed topics which mught have been destined for your next workshop.
- Cupcakes ☺

The Not So Good: - The word delineation bugs me a bit. The dictionary meaning seems appropriate, but the word itself doesn't quite give an non-academic such as myself a clear idea as to what exactly you are attempting to do. We had a short conversation about this during the meeting. I don't know whether there is a more appropriate word that delivers the message a little more clearly.

Feedback from: EN-W01

Participants' feedback on workshop 1: Delineation

Hi everyone,

I just want to take this opportunity to say a massive thank you again for giving me some of your time on Tuesday for my Delineation workshop, it really is highly appreciated.

If you don't mind, would you please spend 5 minutes sharing your input with me so that I can build and improve for my next workshop.

- Can you please explain your experience of the workshop as a whole (This can be anything between 1 and 50 words max)
  I thoroughly enjoyed the workshop, it was a great environment for comfortable discussion regarding our processes and interactions with customers.

- What did you like about the workshop?
  It wasn't work? (Kidding!)
  I enjoyed how everyone felt comfortable to share their views and there wasn't one person taking over – all opinions were welcome.

- What did you dislike about the workshop? What can be improved on?
  Absolutely nothing. ☺

- Any comments or suggestions moving forward:
  Please include me for future sessions! :P

There is no rush for this but whenever you feel like your mind needs a break from your hard work;)

Thank you so much and have an awesome weekend!

Kind regards,

Jess Kühlenthal | Industrial Designer
Skeg Product Development
7 Marconi Road | Montague Gardens | 7441 | South Africa
T: + 27 (0)21 551 1441| | **F:** +27 (0)21 552 9618 | **E:** jess@skeg.com | **W:** www.skeg.com

Feedback from: PC-W01

Hope these help

- Can you please explain your experience of the workshop as a whole (This can be anything between 1 and 50 words max)
  It was a good experience, the concept of analysing things properly I think helped with realising issues.
  Also the cup-cakes were nice

- What did you like about the workshop?
  Mostly the cup-cakes. Discussing issues and processes in a non-confrontational/ neutral matter was very constructive.

- What did you dislike about the workshop? What can be improved on?
  Maybe a better understanding of how the info gained form the workshop will be used?

- Any comments or suggestions moving forward:
  Don't be too nervous and formal when presenting your thesis topic etc. I think skeggers will respond better to a very informal setting. Maybe also try and include the small guys in some of the discussions if possible (Julian, Richard, augastine etc) they might have a completely different view on certain topics that might be valuable

Feedback from: ID-W01

8.6 APPENDIX F:

Workshop 2: User journey to front of stage presentation

Cape Peninsula University of Technology

Mapping product design as a transdisciplinary service.

Customer Journey to Front of stage Co-Design Workshop

Presented by: Jess Kühlenthal
Supervisor: Vikki Eriksson (Du Preez)
Co-supervisor: Veronica Barnes
Case study: Skeg Product Development
April 2018

AGENDA

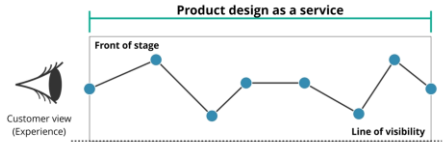
1. CONTEXT
Why are you here?

2. SERVICE BLUEPRINT
What is a Service Blueprint and where is it's value?

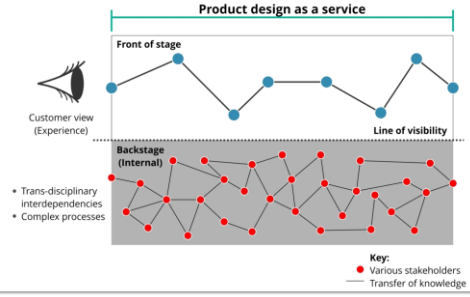
3. PROCESS BREAKDOWN
How will we approach this?

4. NEXT STEPS
What to expect next.

1. CONTEXT
Why are you here?



1. CONTEXT
Why are you here?



1. CONTEXT
Why are you here?

1

Phase One:
Delineation

2

Phase Two:
User Mapping

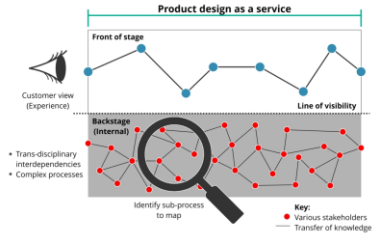
3

Phase Three:
Service Blueprint

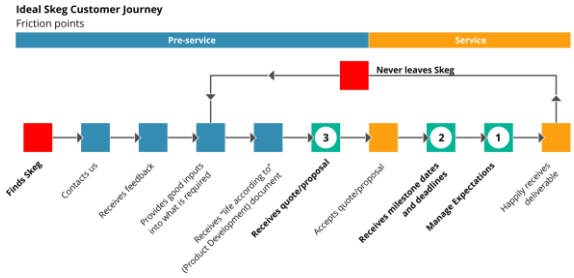
1. CONTEXT
Why are you here?

1

Phase One:
Delineation



1. CONTEXT
Outcome from Phase 1



1. CONTEXT
Why are you here?

2. SERVICE BLUEPRINT
What is it?

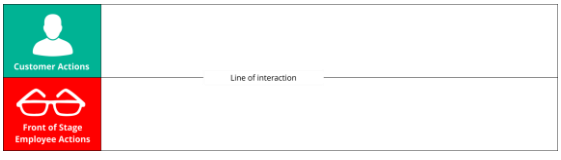
"Service blueprinting is a powerful technique that is used to depict a service at **multiple levels of analysis**."

"Service blueprinting can facilitate the **detailed refinement** of a single step in the customer process as well as the **creation of a comprehensive, visual overview of an entire service process**."

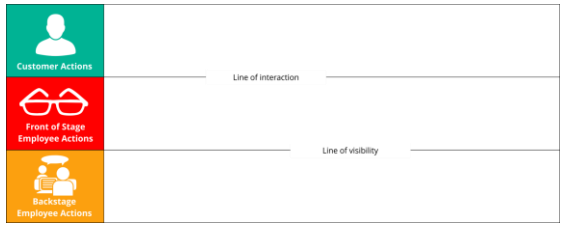
Bitner, M. J., Morgan, F. N. & Ostrom, A. L. 2007. Service Blueprinting: A Practical Technique for Service Innovation

2. SERVICE BLUEPRINT
What is it?

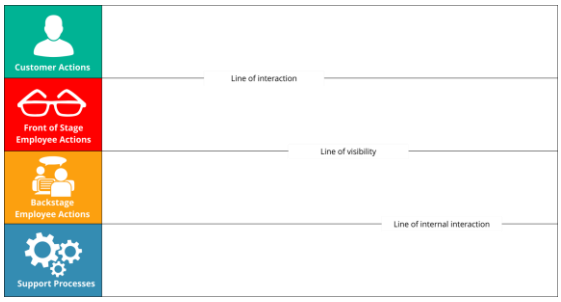
2. SERVICE BLUEPRINT
What is it?



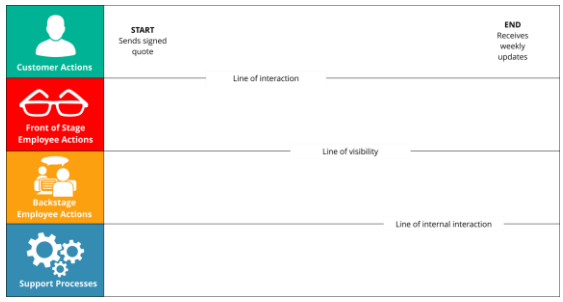
2. SERVICE BLUEPRINT
What is it?



2. SERVICE BLUEPRINT
What is it?



2. SERVICE BLUEPRINT
What is it?



3. PROCESS BREAKDOWN
What's the approach?

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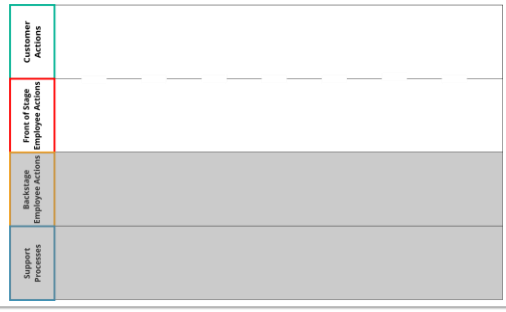
What's the approach?



3. PROCESS BREAKDOWN
What's the approach?

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What's the approach?

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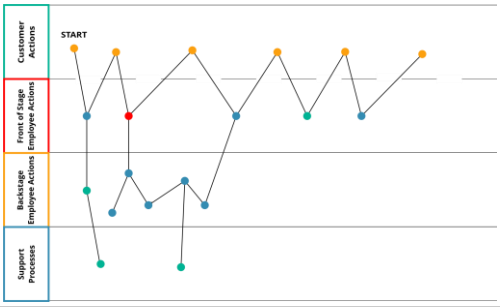
What's the approach?

4. NEXT STEPS
What to expect?



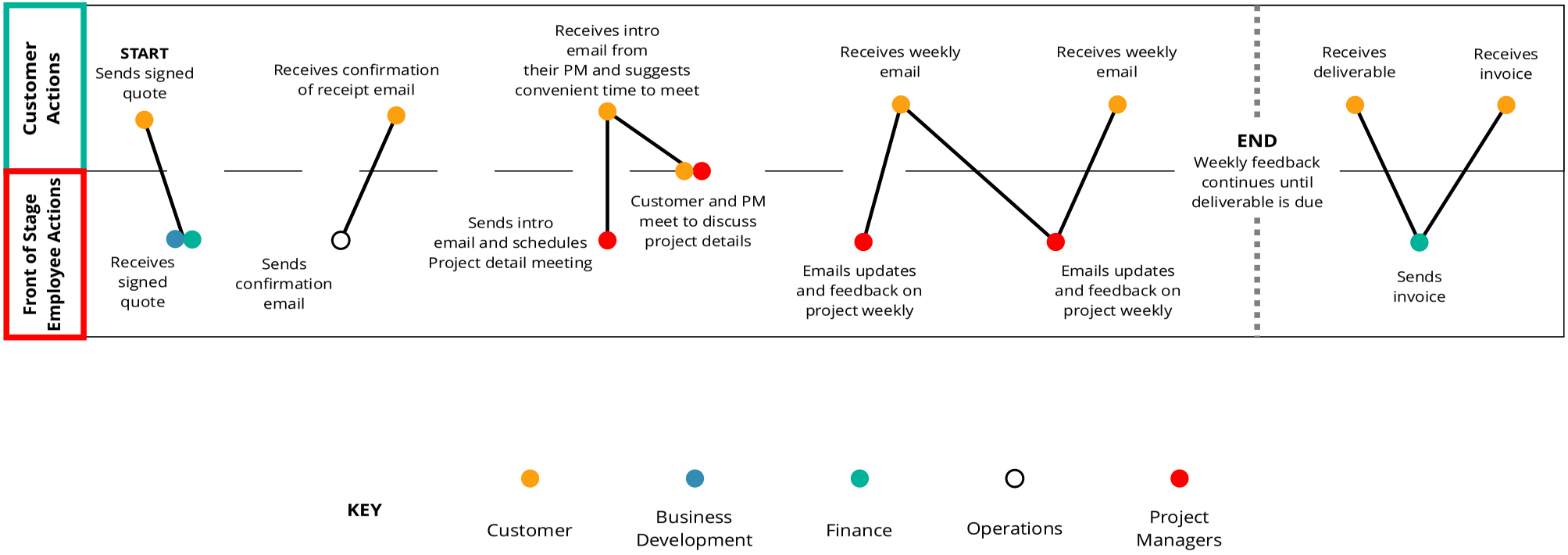
Cape Peninsula University of Technology

Thank you for your time.
Are there any questions?
Do I have your consent to take part?

8.7 APPENDIX G:

Workshop 2 mapped outcome; Skeg's existing user journey to front of stage

Skeg Customer to Front of stage interactions
From receiving PO to weekly feedback



8.8 APPENDIX H:

Workshop 3; Backstage service blueprinting presentation

Cape Peninsula University of Technology

Mapping product design as a transdisciplinary service.

Skeg Service Blueprint Co-Design Workshop

Presented by: Jess Kühlenthal
Supervisor: Vikki Eriksson (Du Preez)
Co-supervisor: Veronica Barnes
Case study: Skeg Product Development
April 2018

AGENDA

1. **RECAP WORKSHOP 2**
   What have we done?
2. **NEXT STEPS IN PROCESS**
   What now?
3. **APPROACH**
   How will we approach this?

1. RECAP WORKSHOP 2
What have we done?

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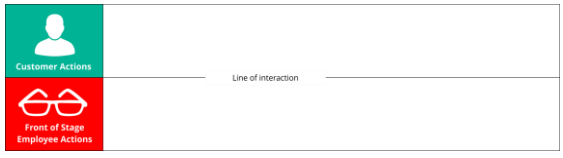
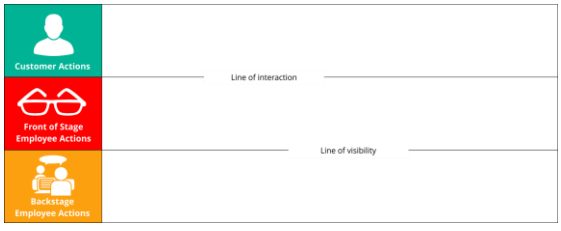
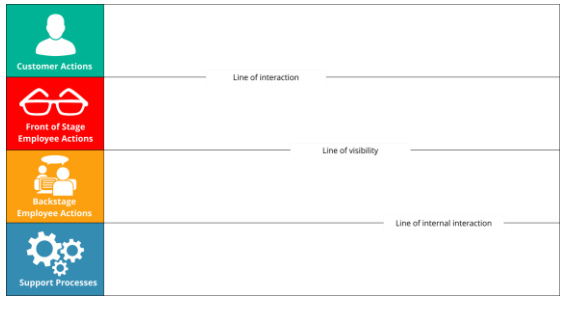
What have we done?



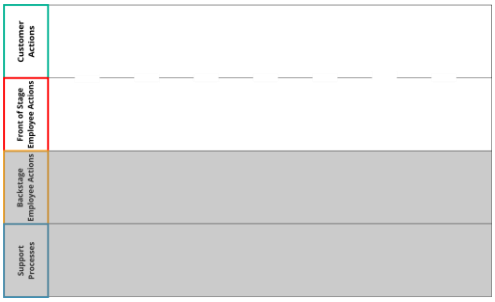
1. RECAP WORKSHOP 2
What have we done?



1. RECAP WORKSHOP 2
What have we done?



1. RECAP WORKSHOP 2
What have we done?



2. NEXT STEPS
What now?

2. NEXT STEPS IN PROCESS
What now?

1

Phase One:
Delineation

2

Phase Two:
User Mapping

3

Phase Three:
Service Blueprint

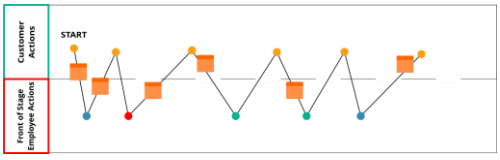
3. APPROACH
How will we approach this?

3

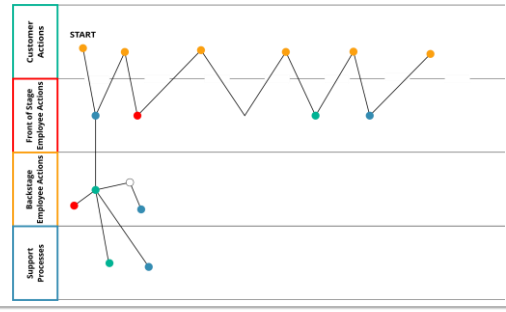
Phase Three:
Service Blueprint

Step One: Recap Workshop 2 Outcomes
Step Two: Add any additional detail/info
Step Three: Map section for section

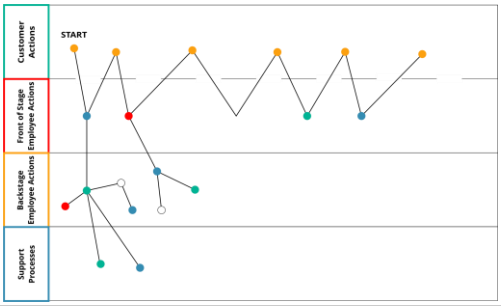
3. APPROACH
How will we approach this?



3. APPROACH
How will we approach this?



3. APPROACH
How will we approach this?



MULTI-INTER-TRANS-DISCIPLINARY
What is the difference?

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Thank you for your time.
Are there any questions?

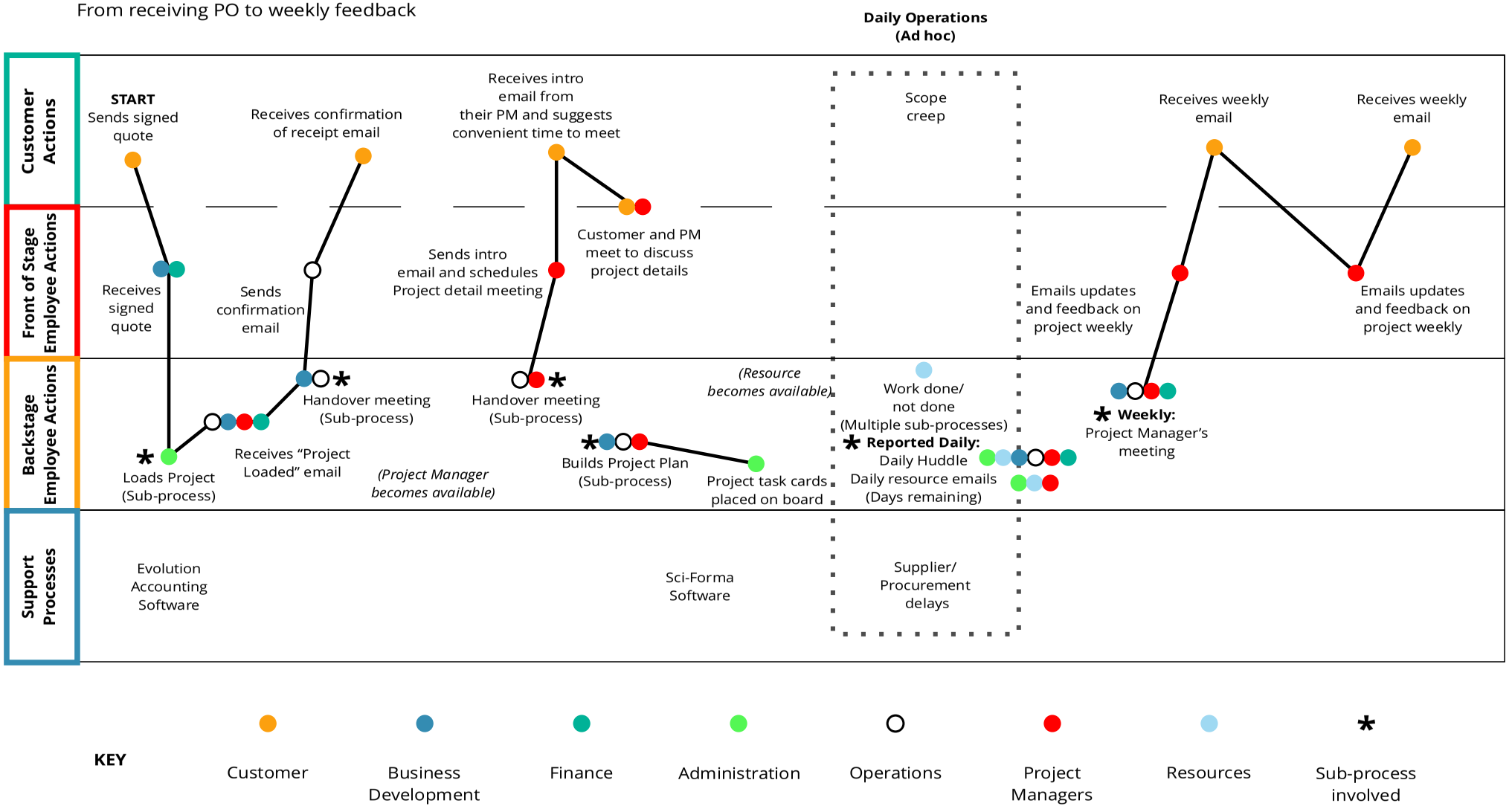
Step One: Recap Workshop 2 Outcomes
Step Two: Add any additional detail/info
Step Three: Map section for section

8.9 APPENDIX I:

Workshop 3 mapped outcome; Skeg's existing service blueprint

Skeg Service Blueprint

From receiving PO to weekly feedback



8.10 APPENDIX J:

Workshop 4; Collaborative analysis of findings presentation

Cape Peninsula University of Technology

Mapping product design as a transdisciplinary service.

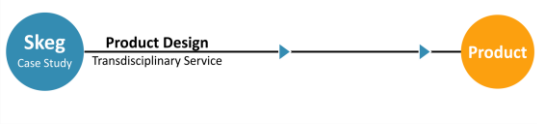
Final Evaluation Workshop

Presented by: Jess Kühlenthal
Supervisor: Vikki Eriksson (Du Preez)
Co-supervisor: Veronica Barnes
Case study: Skeg Product Development
May 2018

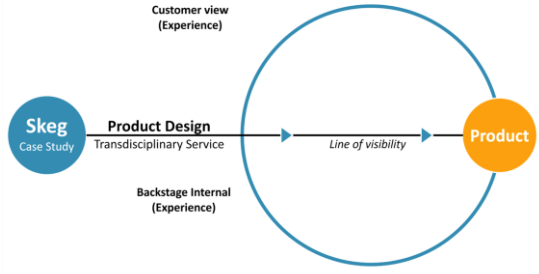
AGENDA

1. **THE PURPOSE**
   Restate the context
2. **BREAKDOWN OF RESEARCH**
   Phased approach
3. **MAPPED OUTCOMES**
   What did we end up with?
4. **DISCUSSION**
   So what?

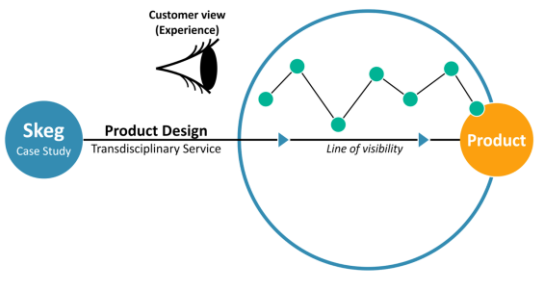
1. THE PURPOSE
Restate the context



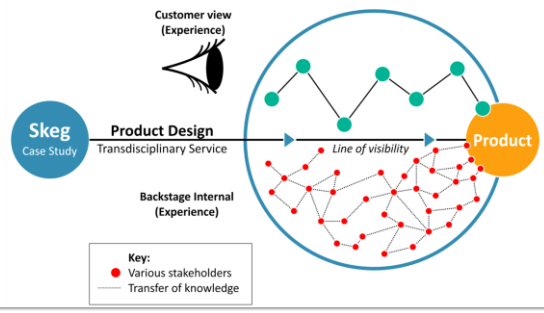
1. THE PURPOSE
Restate the context



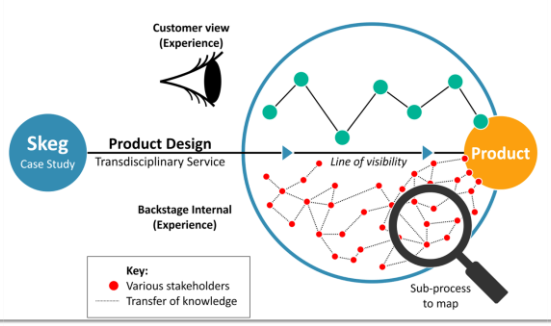
1. THE PURPOSE
Restate the context



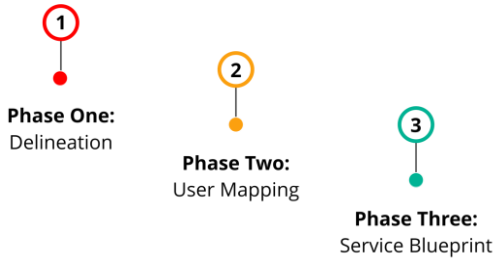
1. THE PURPOSE
Restate the context



1. THE PURPOSE
Restate the context

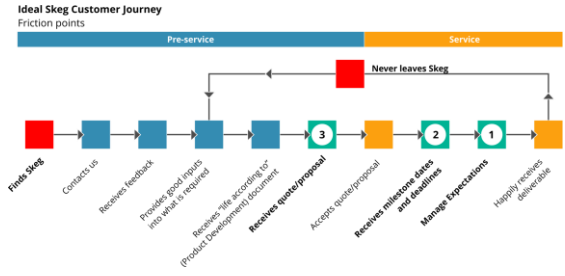


2. BREAKDOWN OF RESEARCH
Phased approach



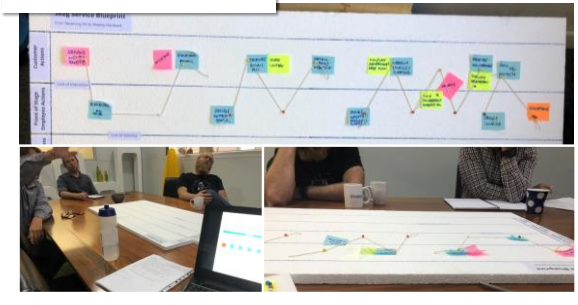
3. MAPPED OUTCOMES
Workshop 1: Delineation

3. MAPPED OUTCOMES
What did we end up with?

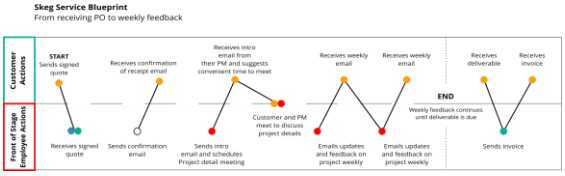


3. MAPPED OUTCOMES
What did we end up with?

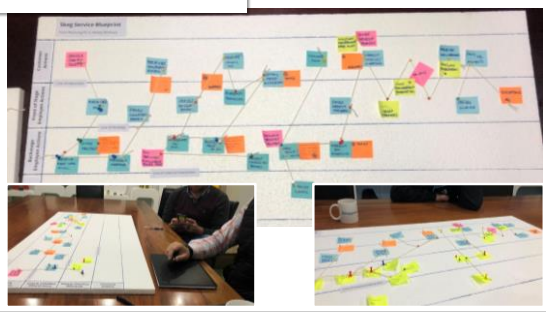
3. MAPPED OUTCOMES
Workshop 2: User Journey



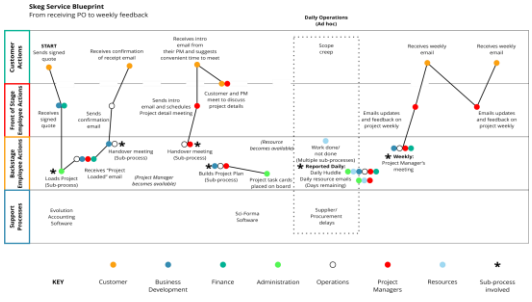
3. MAPPED OUTCOMES
What did we end up with?



3. MAPPED OUTCOMES
Workshop 3: Blueprint



3. MAPPED OUTCOMES
What did we end up with?



3. DISCUSSION

So What?
What does this mean?

3. DISCUSSION

	To you, The individual	To Skeg, The business
The Process of Mapping		
The Physical Mapped Outcome		

3. DISCUSSION

Did you notice any trends or patterns?

3. DISCUSSION
So what?

Expectation
- Set and Manage
- Types of Expectation

Processes and sub-processes
- Level of detail

Independent interactions

Various stakeholder interactions with customer

Cape Peninsula University of Technology

Thank you for your time.

Jess Kuhlenthal (212004891)- Mapping product design as a transdisciplinary service.