USER EXPERIENCE AND INTERACTIVE TECHNOLOGY IN FASHION STORES

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ABSTRACT

USER EXPERIENCE AND INTERACTIVE TECHNOLOGY IN FASHION STORES

Many fashion brands have already incorporated interactive technology (IT) into their stores as a means to provide consumers with digital experiences. Interactive technology enables consumers, that is, store visitors, to explore the digital world of the brand interactively while being immersed with the physical store elements. Consumers can therefore have experiences in both physical and digital worlds. It can be argued that the integration of interactive technology in fashion stores can potentially heighten the overall consumer experience

The research purpose was to explore consumer experience with interactive technology in fashion stores. More specifically, it centres on the evaluation of consumers' interaction experience with the digital world while in parallel experiencing the physical world. Given that the underlying phenomenon concerns interaction between humans and interactive devices, a user experience design (UXD) approach was adopted for this research; as the lens for the literature review, the methodology and the analysis of data.

The strategy for the primary research was rapid ethnography; combining three methods: protocol analysis, observation and interview. The data collection was undertaken for over eleven months, consisting of two main studies and eight data collection activities (DCAs). Fifty-one people participated in the studies and DCAs. All the data were analysed via five stages, in which one prominent UXD framework: the four threads of experience (4TE), was utilised for the analysis process.

The findings are presented thematically; there are four main themes and nine subthemes. All of these embody Insights and narratives for responding to the research questions. The first core concept that can be taken from the findings is the notion of *dynamic experience* referring to a moment in which the users of interactive technology (IT) can experience the two world frames of digital and physical dynamically. Another core concept is *channel harmonisation* that refers to the implementation of a balanced channel. The research demonstrates the suitability of UXD as an interactive design theory or framework for fashion marketing research concerning experiences of technology. Implications for research and recommendations are provided.

CHAPTER ONE:
INTRODUCTION

1.1 INTRODUCTION

Many consumers are becoming more digitally confident as they fluently use devices such as smartphones, for digital fashion shopping (Koo 2016; ComScore 2016; 2017). Despite this, they still regularly visit physical fashion stores (Mintel 2017). Multi-sensory experience, particularly tactile, appears to be one strong reason behind a store visit as it can help a purchase decision (Spence et al. 2014; Alexander and Nobbs 2016; Mintel 2017).

A store visit however need not end with a purchase (McCormick et al. 2014). Consumers often visit a physical fashion store for experiences - entertainment, leisure, direct brand interaction, social interaction, and inspiration (Kent 2007; Dennis et al. 2012; Kent et al. 2015). As such, physical store experience is increasingly regarded highly in today's world (Mintel 2017; Alexander and Alvarado 2017).

With the aim of elevating the consumer experience, many fashion brands incorporate interactive technology (IT) in their physical stores (Mintel 2017; Alexander and Alvarado 2017; Bonetti and Perry 2017). IT enables consumers - store visitors - to explore the digital world of a fashion brand interactively.

Moreover, given that the IT is installed in a physical store, consumers can therefore experience both the physical and digital worlds of a fashion brand. This combination of digital and physical experiences can potentially heighten the overall consumer experience (Poncin and Ben-Mimoun 2014; Dennis et al. 2014; Kent et al. 2015; Alexander and Alvarado 2017).

This research stands within the fashion marketing discipline; it covers fashion retail, consumer-brand interactions and experience of fashion. More specifically, the positioning of the research is on consumers' interaction experience with interactive technology in fashion stores. A user experience design (UXD) approach was deemed appropriate to conduct the research because the underlying phenomenon being explored focuses on the interaction between humans and interactive devices. The next section, research rationale, unpacks the background and context to explain the rationale for the research.

1.2 RESEARCH RATIONALE

Of the many influences on the way consumers shop, technology is well to the fore (Ha and Stoel 2009; Herhausen et al. 2015; Mintel 2018). There seem to be a rising number of digitally confident consumers who have been using their personal devices, such as the smartphone, for digital fashion shopping activities (Mintel 2016; 2017).

The proliferation of fashion pure-play retailers, for example ASOS, has intensified the situation and profoundly affected the way consumers shop, as they lean more towards online shopping rather than visiting physical stores (McCormick et al. 2014; Parker and Wang 2016; Backstrom and Johansson 2017). Interactivity and efficiency are the possible reasons behind this (Fiore, Jin and Kim 2005; Huang and Liu 2014; Beuckels and Hudders 2016). So much so it was believed that the

online store could threaten the existence of the physical store (McCormick et al. 2014; Comscore 2018).

Nevertheless, a paradox appears to have surfaced. Although consumers may be viewed as inseparable from their digital devices, and sufficiently content with online shopping, they still visit physical stores (Mintel 2017; 2018; Euromonitor Interntional 2018). Sensory experiences, especially tactile, may be argued as a strong motivation for a physical store visit (Spence et al. 2014; Alexander and Nobbs 2016). Many studies on fashion shopping underline that consumers can also have expectations beyond product and service; consumers expect experiences (Holbrook 1994; Sachdeva and Goel 2015; Alexander and Cano 2018). Fashion consumers seek values in their everyday lives, consequently, they go through sets of decisions and actions for its gratifications, including experience consumption (Ko et al. 2016). Notably, consuming experiences need not end with purchase (McCormick et al. 2014; Caru and Cova 2015).

It is significant that consumers frequently use their personal devices during the store visit (Verhoef et al. 2015; Grewal et al. 2018; Perry et al. 2018). They typically search for detailed information, compare prices, and do style matching (McCormick et al. 2014; Herhausen et al 2015; 2017; Perry et al. 2018). Such activities indicate an opportunity as well as the necessity to integrate the physical store with interactive technology (IT) (Huang and Liu 2014; Verhoef et al. 2015; Pauwels and Neslin 2015). Because by having IT in physical stores a fashion brand can accommodate consumers' proclivity for digital interaction and providing them with experiences. More importantly, when interacting with IT, consumers can experience a brand's digital world while being immerse with the physical store elements (Alexander and Alvarado 2017).

In response to this, many fashion brands have started integrating interactive technology within their physical stores (Mintel 2016; 2018; Euromonitor International 2018; Bonetti and Perry 2017). It can be argued, however, that the

integration of interactive technology in fashion stores is still in its early stages; such technology integration still requires improvement, as it is relatively limited and underexplored.

There are limited studies that have investigated interactive technology in a physical store. Furthermore, the studies have mostly covered either the technology applications, the antecedents for the technology usage or the impact of the technology, but not the experience process. Particularly in the area of fashion marketing, there is very limited research on interaction experience - when a user is using an interactive technology in a fashion store. For instance, Kent et al (2015), and Bonetti and Perry (2017) explored technology applications in fashion stores; Huang and Liu (2014) investigated the reasons behind a magic mirror usage; Dennis et al. (2012; 2014), and Alexander and Alvarado (2017) explored the impact/role of the technology in fashion stores. All this highlights the importance of understanding the experience with interactive technology in fashion stores. In summary, UXD was used to conduct the research not only as the approach but also as the main theoretical framework because it concerns the iterative processes of perception-action when using an interactive technology. Moreover, UXD covers user experience with technology more holistically.

It should be underlined that the digital channel is becoming highly relevant in marketing channel design. Therefore brand-consumer communication engagement is paramount, predominantly in the fashion marketing area where a digital channel and physical store are key aspects for the engagement.

Integrating interactive technology in physical fashion stores can arguably generate distinctive experiences and also a new kind of interaction between the fashion retail brand and their consumers (Armstrong and Rutter 2017), all of which will be beneficial not only for the brand but also for the consumers (McCormick et al. 2014; Sachdeva and Goel 2015; Belghiti et al. 2017; Alexander and Cano 2018). Furthermore, previous studies have underlined the importance of

understanding consumers' experience (Holbrook 1994; Schmitt and Brakus 2015; Verhoef, Kannan and Inman 2015), specifically with technology (McCormick et al. 2014; Herhausen et al. 2015; Sachdeva and Goel 2015; Kent et al. 2015; Alexander Alvarado 2017).

The rationale for the research has demonstrated the salient aspects of interaction experience. The application of interactive technology in fashion stores is therefore timely and appropriate, and requires a deeper understanding of the experience of integration. Consequently, this research centres on the interaction experience with interactive technology in fashion stores.

1.3 RESEARCH AIM AND OBJECTIVES

The principal aim of this research was to explore consumers' interaction experience with interactive technology in fashion stores. Through a deeper understanding of that particular interaction experience, implications for theory and practice can be achieved; theoretical understanding of user experience and best practice of designing interactive technology for a fashion store.

In order to achieve the research aim, six objectives were established:

- To identify gaps in literature by conducting a literature review surrounding the topic that contextualised experience and experience with technology, categorised interactive technology in fashion stores, and investigated the elements of a physical fashion store and channel integration. Moreover, it will evaluate the suitability of user experience design (UXD) as a research approach

- To design a methodology and apply methods underpinned by a user experience design (UXD) approach, and apply them as the driver for the primary research

- To obtain data for answering the research questions through primary research that requires in situ data collection in fashion stores through appropriate methods

- To generate findings and insights that can answer the research questions by analysing the data gathered via the data collection methods

- To generate a theoretical foundation for understanding interaction experience with interactive technology in a fashion store

- To design a framework for integrating interactive technology in a fashion store

1.4 RESEARCH ETHICS

The research has passed the Nottingham Trent University (NTU) ethical clearance process and was approved by the Joint Inter College Ethics Committee (JICEC) for the College of Art, Architecture, Design and Humanities and the Centre for Academic Development and Quality (CADQ). This research meets NTU's research ethics policy, NTU's data management policy, and the regulations for the use of computers and risk assessment in research (see appendix 3 for details).

1.5 STRUCTURE OF THE THESIS

Chapter one presents the direction of the thesis. Its background is described before finally elaborating the rationale of the research. Subsequently, the principal purpose and the objectives of the research are stated and the research contribution is also shown. Finally, the ethical clearance of the research is declared.

Chapter two presents the literature review in which relevant literature and the theoretical background are reviewed critically. The chapter closes with the research gap identification followed by the statement of research questions.

Chapter three presents the methodology. A detailed plan of the methodology, including the research philosophy, the use of a type of ethnography - rapid ethnography - and methods using protocol analysis, observation and interviews are discussed, followed by a description of the implementation of the primary research.

Chapter four presents the findings and discussion. The primary research generated findings that are presented thematically. The core concepts that incorporate all narratives and insights of the findings are then discussed with literature and theoretical background from chapter two. Lastly the statement of responses to the research questions is shown.

Chapter five presents the conclusion and implications of the thesis. The implications for theory and practice are presented at the end of this section. In closing, the research limitations are described and directions for future research are put forward.

1.6 CHAPTER SUMMARY

This chapter introduces the thesis showing the current situation, the significance of the research as well as the purpose of the research. In a world where people are becoming more familiar and confident with digital devices, physical fashion stores still appear valuable. Consumers are becoming concerned more with fashion shopping experiences without having to think much about the channels to use (physical or digital). Fashion brands' integration of interactive technologies in physical stores, opens a possibility for a distinctive consumer experience via the convergence of the two worlds' experiences. Despite the importance of such a topic, the literature and practical applications are still limited. Thus, the purpose of the research is to explore the interaction experience with interactive technology in fashion stores.

CHAPTER TWO:
LITERATURE REVIEW

2.1 INTRODUCTION

The literature review consists of three main body of knowledge. The first is consumer and experience, which is the base of the phenomenon itself. The review on experience covers general human experience and experience with technology as well as other type of experience such as the customer experience journey. The second reviews the external elements or stimuli for the experience. This includes but is not limited to interactive in-store technology, atmospherics and channels. The third is a review of interaction experience that forms the interplay between all the elements. It covers the anatomy of interactivity, the types of interactivity, and its characteristics. As stated in chapter one, the user experience design (UXD) approach was employed for explicating this research. In particular, one prominent UXD framework, McCarthy and Wright's (2004) four threads of experience is reviewed in the later part of this literature review. In order to simplify the literature review, a conceptual framework for chapter two can be seen in figure 1.
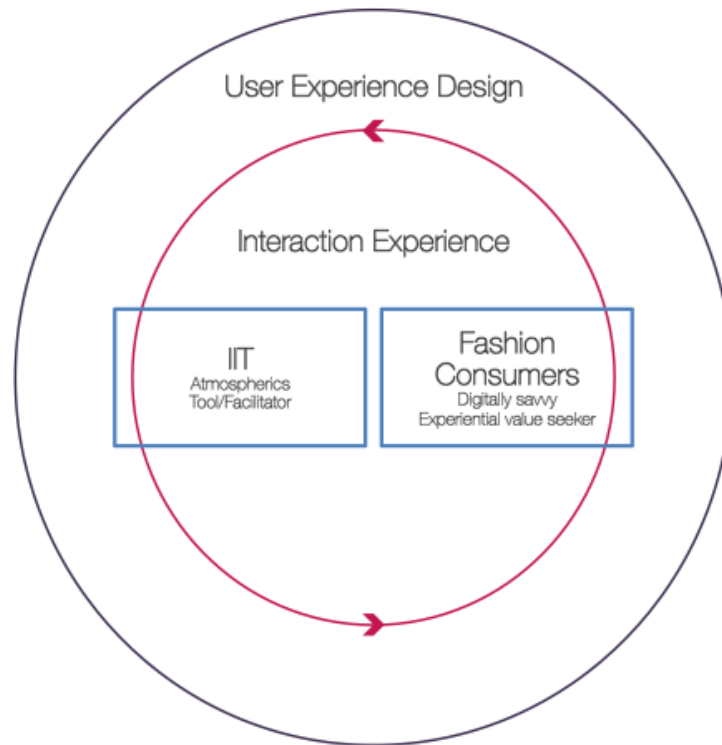
Figure 1. Literature review conceptual framework

At the end of this chapter, the gap identified from the literature review is presented, with a statement of research questions. The chapter closes with a summary.

2.2 EXPERIENCE AND TECHNOLOGY

2.2.1 Defining experience

The term experience is indelibly linked with human life. Although generally people may be familiar with the term, experience is a complex concept and difficult to frame (Jantzen 2013). While experiencing is a natural state which happens with or without one's full awareness, it is known to be more about moments that are memorable, both good or bad (Pollio, Henley and Thompson 1997). However it can be argued that in order to better obtain and recall those

memorable experiences, higher awareness of the moments is required. One of the most prominent scholars of experience, Mihaly Csikszentmihalyi, writes that "the best moments in our lives are not the passive, receptive, relaxing times… the best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile" (Csikszentmihalyi 1990, p. 3). This should mean that those moments of experiencing require the person to make an effort and to be in a state of active awareness. With that, their attention is fully pointed towards the activity, making the moment more perceptible and possible to be framed (Hansen and Mossberg 2013). As such, although experience often refers to memorable or meaningful things, it is pertinent that experience is also defined by high awareness perceptions and high effort actions over a particular length of time. Experience therefore is a combination of process and knowledge.

From a psychological perspective, Jantzen (2013) brings in a semantic explanation of experience from the German language and its division into two elements, erfahrung and erlebnis. The former refers to knowledge in different forms: observational knowledge, practical skills and conscious knowledge. The latter refers to the process of perceiving; sensing and feeling. The two aspects of experience are working together forming human experiences. Although which precedes the other is not substantiated clearly in the article. Jantzen (2013) asserts that knowledge (erfahrung) results from perceptions (erlebnis), but knowledge is also the source which perceptions rely on. While the two aspects work together interweaving human experiences, the perception processes appear to drive the sequence. Perception processes are naturally attached to human actions, meaning stimuli can be perceived even when the awareness on the perception processes is low (Wright et al. 2018). Thus it can be stated that human perception shapes the stimuli for experiences. Further, when the perception processes have clearer points at the start and end, the quality of the experience can be higher.

Hassenzahl (2010, p. 20) a cognitive psychologist and computer scientist defines experience as:

> An episode, a chunk of time that one went through–with sights and sounds, feelings and thoughts, motives and actions; as they are closely knitted together, stored in memory, labeled, relived and communicated to others.

This definition brings up a clear indication of borders (episodes) between experiences, meaning most experiences can be differentiated irrespective of the quality. Without having to be reductive, experience can also be categorised. Forlizzi and Battarbee (2004) suggest that experience can be distinguished into three types. The first is experience, which refers to a combination of consciousness and activities flow that runs perpetually and subsequently composes life. The second type is an experience, which can be translated into a flow of experience unified into a moment containing a start point, middle story and an end point; therefore it can be specified, told and articulated. The last type is co-experience, which points to jointly produced and socially shared experiences.

These definitions indicate that the term experience is linked to perception (Vernon 2017) and more importantly memory (Paller and Wagner 2002; Vernon 2017) along with emotion, and; cognition, affect and behaviour (Jantzen 2013). All this works together in a dynamic and perpetual sequence, constituting experience (Hassenzahl 2010). This implies that experience actually emerges from the interplay of several factors, which to some extent can be manipulated and designed. In essence, experience is constructed through perceiving stimuli that can be manifested in many perceptible forms. In other words, in order to produce experience one should be able to perceive and interact towards the environment in which one is presented (Lash 2006; Wright et al. 2018). Other than that, there are points that mark the beginning and the ending of each experience that normally overlap into each other (Hansen and Mossberg 2013).

While it may be rather difficult to remember each experience clearly, 'frameable' experiences can be more distinctive than the others.

2.2.2 User Experience and interactive technology

In the light of technological advancements, most people have been experiencing the world through or with personal devices. They are using their personal devices for many daily activities, such as tasks completion assistant, information finder, entertainment provider, and social connections (Koo 2016; Comscore 2014; 2018). Thus it is contended that people are attached to their personal devices for and during experiences (McCarthy and Wright 2004; Jensen 2013)

Much literature has examined how people use technology or the interplay between people and technology from diverse perspectives. Within a marketing consumer behaviour perspective, Wang, Liao and Yang (2013) investigated the factors influencing the use of mobile applications by employing consumption values theory. Another approach, using uses and gratifications theory, was taken by Raacke and Bonds-Raacke (2008) who addressed the topic through friend-networking sites on the Internet from media and communication. Although these studies make a substantial contribution to the field, however they do not address the actual interactive behaviour with the technology.

Among the disciplines that concern the relationship between human experience and technology, human-computer interaction (HCI) is at the forefront. In essence, HCI concerns how technology can be adapted to human nature (Rogers et al. 2011). There are other areas, which have a slightly similar core body of knowledge, such as ergonomics, human factors and usability engineering. Nevertheless, HCI looks more into an efficient action or what can be called usability. In their early days, computers tended to serve as a working "tool", hence the need to be more efficiently used. This is part of the reason why HCI

focuses more on "getting the job done", with a very technical approach that is related more to computer science by tapping more into software and hardware design. Moreover, HCI is more specific about the actual interaction between humans and objects of technology, such as user interface, physical build, layout, and software system. It was considered as insufficient nevertheless, as people in general often expect technology to be pleasurable as well (Hassenzahl and Laschke 2015; Silvennoinen 2017). In fact, acknowledging technology only as an instrument to complete tasks or having a utilitarian characteristic is very limiting.

Despite its specificity and sophisticated approach, HCI eventually was considered as insufficient. Research on human-technology within this decade has started calling to have a more holistic approach for covering a user's experience with a technology – an approach that is able to address both efficiency and pleasure (Pucillo and Cascini 2014). As suggested by Hassenzahl (2008), feelings and experiences are at the centre of human motives for using technology, which led to calls for an approach that can cover all aspects of experience (McCarthy and Wright 2004; Hassenzhal and Tractinsky 2006; Law et al. 2009; Hassenzahl 2010). User experience design (UXD) emerged as an approach that concerns ways to design technology for a pleasurable and efficient experience.

The term user experience was first introduced by Don Norman in 1988 as the result of decades of research in HCI, which found that usability was too narrow to understand the relationship between people and technologies. He proposed the idea that machines and software should cater for users' needs. When creating a product, whether physical or digital, users' needs and desires should always be the dominant driving force behind a design (Norman 1988).

Unlike HCI, UXD opens a body of knowledge beyond the interaction per se, as it touches on psychological and social as well as physical design factors (Hassenzahl et al. 2013). Many user experience researchers have leaned towards the same acknowledgement that UXD should be positioned in the first order

while HCI is the subset of it because the former covers a more holistic perspective of experience with technology (Swallow, Blythe and Wright 2005; Desmet and Hekkert 2007; Law et al. 2009; Wright et al. 2018). In order to help users to achieve the best user experience with interactive objects/devices, designers should extend their understanding beyond the ease of use aspects of the technology. Because when using an interactive object/device a user would expect pleasant interactions, such as, enjoying the graphics and visuals, content and context (Wright and McCarthy 2010). Considering aspects that are able to evoke positive emotions are therefore paramount. By covering all aspects of the interaction experience, designers can help shape a more holistic experience for users of the technology.

2.2.3 User experience and User Experience Design (UXD)

In the context of technology, several studies and articles have attempted to define user experience. One of the most regarded definitions comes from Hassenzahl and Tractinsky in their article User Experience – A Research Agenda, which states that user experience is "a consequence of a user's internal state, the characteristics of the designed system and the context within which the interaction occurs" (Hassenzahl and Tractinsky 2006, p. 95). In a later study Hassenzahl also defines UX as "a momentary, primarily evaluative feeling (good-bad) while interacting with a product or service" (Hassenzahl 2010, p. 20). A more detailed definition can be seen in a study by Pucillo and Cascini (2014, p. 117) stating that user experience is

> a consequence of the presentation, functionality, system performance, interactive behaviour, and assistive capabilities of an interactive system, both hardware and software. It is also a consequence of the user's prior experience, attitude, skills, habit and personality.

From those definitions, it can be argued that user experience is complex thus cannot be reduced into a single understanding. Moreover, it is not only about efficient ways for achieving something with or on a technology; user experience is also about a user's internal state, in which emotions play an important role.

This is one important reason for the strong connection between user experience and user experience design (UXD). Human perception and feelings are significant elements for UXD as it leans more towards human emotion (Norman 2004). The human-centredness of UXD closely engages with motivations, expectations and actions during interaction and the emotions thereby created (O'Brien 2010). Within this perspective, technologies are conveyors of experiences (media) - the experiences are not embodied but shaped through the technologies' influences on humans' feeling, thinking and behaviour (McCarthy and Wright 2004; Roto et al. 2011).

UXD essentially transcends functionality (Anderson 2011), as it accounts for pleasure, aesthetic, creativity, ludic value, fun and more importantly emotion (Gaver and Martin 2000; Swallow et al. 2005; Lallemand et al. 2015). In other words, it is how interactive technological products can be designed and evaluated through a more holistic perspective (Hassenzahl, Diefenbach and Göritz 2010). Given its holistic perspective, it should be noted that it is plausible to use UXD for all types of technologies. For instance a utilitarian or functional based technology that requires efficient interactions like fitness trackers, can be viewed from both efficiency and pleasure aspects. Although the function is highly important, graphics representing the informatics are of equal importance.

Many UXD studies have pointed out how emotion is at the deepest core of experience, or the language of experience (McCarthy and Wright 2004; Norman 2004; Hassenzahl 2010; Jokinen 2015; Wright et al. 2018). Experiential aspects embodied within UXD emphasise emotions and affect, which play an important part in shaping the interaction process, including how a product can be evaluated

and communicated (Forlizzi and Battarbee 2004; McCarthy and Wright 2004; Hibbeln et al. 2017). Ultimately, positive experiences and happiness are the goal of designing a user experience through an interactive technology (Hassenzahl and Tractinsky 2006; Lallemand et al. 2015).

In a wider focus, surrounding emotion, various systems inside human are interacting subsequently producing experience (Hassenzahl 2010; 2013). Thus experience emerges from the intertwined works of perception, action, motivation, emotion and cognition in dialogue with the world (place, time, people, and objects). Experience actually emerges from something or in this case the interplay of several things, which to some extent can be manipulated and designed. However, there are many aspects and factors that are beyond control, for one, relatedness. For this reason an attempt to design and craft an experience does not always resulted a 'guaranteed' or aimed experience.

The experience delivered by a technology is what can make the technology to be meaningful (Hassenzahl 2015). That is why it is necessary to place experience at the forefront rather that the product itself (Hassenzahl 2010; Buley 2013). As might be expected, the notion to prioritise experience requires deep evaluation on the definition, meaning and the outcome of a technology (Hassenzahl and Tractinsky 2006; Anderson 2011; Hassenzahl et al. 2015).

Although it is difficult to be able to state that happiness can be achieved through an activity alone, the best part of happiness could be derived from activity by activity, therefore changeable, because of the context on each activity (Lyubomirsky 2007). Happiness is possible to be achieved by people through experiences they can control, and in this regard, experiences that are mediated by technology (Hassenzahl et al. 2013; Mekler and Hornbaek 2016).

2.2.4 User Experience Design Schools

User experience design (UXD) as a field and an approach have emerged as the result of the calls for a discipline that could help to address research about the interactive experience between human and technology. It covers the gap in human computer interaction (HCI) studies that focuses only on usability or efficiency (Hassenzahl and Tractinsky 2006). The UXD approach therefore could be employed to more comprehensively explicate humans' interaction experience with interactive technologies. This is done by introducing an efficiency aspect and more importantly, an experiential aspect that includes pleasure, fun and enjoyment (Norman 1988; Lallemand et al. 2015).

Blythe and his colleagues (2007) contribute greatly UXD by classifying the school of thought into two approaches, which are holistic and reductive. The holistic approach holds experience as streams of thought that cannot be classified or otherwise limiting its concept (Pucillo and Cascini 2014). Further the approach views experience as a complex concept that can only be shaped and not created. It would be difficult to measure therefore and in a way can only be understood to inform designers when creating an interactive product that can shape experiences (for example, McCarthy and Wright 2004; Wright et al. 2018).

McCarthy and Wright's (2004) work is one example that stands in the former, the holistic approach, proposing that experience with and through technology is impure and constantly changing throughout the time. Reducing experience into a simple source would dismantle the examination process of the phenomenon object. It was emphasised that the "importance of looking at experience in terms of the interplay between sensation, emotion, intellect and action situated in a particular place and time. This is what experience researchers mean when they talk about a holistic approach" (Wright & McCarthy, 2010: p. 14). They also designed a framework to help analyse an experience with a technology called

the four threads of experience, containing sensual, emotional, compositional and spatio-temporal.

By contrast the reductive approach renders experience view from cognitive psychology, believing that experience complexity can be reduced into measurable constructs (Hassenzahl 2010). These constructs are believed to have a close link to humans' basic needs and values from which lead to experiences. The reductive approach further holds that experience, although complex, could be reduced to separate constructs and thus could be measured quantitatively (for example, Law et al. 2009; Hassenzahl 2018).

For instance the work of Hassenzahl (2010), argues that experiences are possible to be broken down into constructs because they are sourced from human needs. Technology therefore can be designed in a way according to the relevant needs. Taking a cognitive psychology approach, and drawing from Sheldon's (2000) work on human needs, he proposes need fulfillment theory, which posits that positive experience and meaning can be obtained through interactive technologies or products when one of the six primary needs are fulfilled. These are competence, stimulation, autonomy, relatedness, popularity, and security (Hassenzahl 2010). Competence refers to the feeling of capable and effective to accomplish tasks with technology. Autonomy is the feeling of doing experience with one's own will (intrinsic) and not because of external forces. Relatedness is the feeling of being connected with others and/or having someone as opposed to being alone. Stimulation is the feeling of physically and mentally stimulated with pleasure and enjoyment through activities with interactive product/technology. Popularity is the feeling of being liked and to have influence over others. Security is safe feeling, certain, and able to control life and circumstances.

This research is aligned with the holistic approach, viewing experience as something that cannot be reduced and measured precisely. With a more holistic

point of view, UXD approach can assist this research and subsequently help gain better insights.

2.3 TECHNOLOGIES IN FASHION STORES

When they were first introduced most technologies used in stores were for transactional and operational purposes. The first recognised technology used inside a physical store was a machine for customers to pay by credit card which was introduced in the late 1950s (The UK Cards Association 2017). Two decades later in the 1970s barcode technology followed as the second used of significant technology (BBC 2017). A barcode is basically used to register and retrieve data, mainly the price value of products in stores. These two technologies, with much improvement, still can be found in physical stores. In the late 1990s radio frequency identification (RFID) was introduced in retail. RFID's most important function is somewhat similar to barcodes, however it is more advanced as the RFID label can be applied in various forms. Moreover, it does not always need a scanner, as it can use an identification processor in various devices (RFID journal 2015). RFID enables staff to find product quickly within stores, and to deliver it to the customer or have it ready for that person to pick up in-store (Roberti 2018).

Despite the importance of these technologies, it can be said that digital signage is the most noticed and acknowledged by customers as in-store technology. One reason is because it provides customers with information that is useful for shopping (Schaefller 2008). Another is because of the look of digital signage, with large screens using bright displays to show advertising and marketing messages. All of these technologies have been adopted by many retailers over many decades ago. However, there is also an increasing application of in-store technologies that are interactive in fashion stores over the past years (ComScore 2014; Mintel 2016).

Looking at the differences, in fashion stores there are four levels of in-store technologies in relation to their functions and applications (Kent et al. 2015). The lowest level is a store with no installed technology present. Topping on the second level is technology applied as part of stores' ambience. Digital signage showing a looped video of the latest product is one example. On this level, normally the technology is non-interactive/passive. Its saliency is also relatively medium as it has an equal role as other store elements, for one: visual merchandise (Ballantine et al. 2015). On another level, technology is applied as stores' facilitator. Product finder is one of the representations. The fourth and the highest level is the incorporation of technology as a device to integrate the physical world and the virtual world. Typically this kind of technology is both functional and experiential, for instance a digital changing room with an augmented reality (AR) system (Huang and Liu 2014). The latter, somewhat shows that on some applications, level four type of technology serves more as an experiential device and an interactive entertainment.

Given that the central phenomenon of this research concerns interactive in-store technology, it was decided to put aside level one as it represents stores with no technology. Thus only the other three levels are used in order to be more focused on the use of technology. Applying this framework, therefore, at the first level technology is part of an ambience, at the second technology is a facilitator, and at the highest level technology is a place for physical and virtual integration. Of all levels, only level two and three however possess interactive traits.

Apart from their levels, fundamentally, in-store technologies can be divided into two types: non-interactive and interactive. The former refers the technologies that can only be perceived and not used; the latter enables store visitors to use, engage and interact with the content system. The next subsection discusses the non-interactive technologies in fashion stores first before finally going further into the discussion of the interactive ones in another subsection.

2.3.1 Non-interactive technologies in fashion stores

Generally speaking, it can be said that non-interactive technologies inside fashion stores take many forms. Elevator or lift, automatic doors and even lighting systems for instance can be regarded as technological devices. However, they are not installed in stores for marketing purposes, rather they are more about basic technologies for supporting the activities of a store. In other words they are technologies for operational.

Non-interactive technologies that are built for marketing purposes are those that can be used for understanding consumer behaviour or aiding and persuading consumers to purchase (Schaefller 2008; Dennis et al. 2012; Brynjolfsson et al. 2013; Erevelles et al. 2016). Thus, they can be used as analytics and/or for communicating advertising and marketing messages (Niemeier et al. 2013; Erevelles et al. 2016).

The term analytics here means that fashion retailers can use the technology to gather data from the consumers (Brynjolfsson et al. 2013). This data may come from movements, such as footfall; or shopping activities, such as purchase, taking/trying merchandise (Cox 2011). Given its underlying characteristics of recording consumers' data, analytics technology is often regarded as unethical or even further breaching privacy (Kenny et al. 2012; Bradlow et al. 2017). Although there are some indications that consumers mostly know of this condition or even if they did not know, consumers tend to be less concerned (Nebeker et al. 2015). Despite this, analytics technologies are increasingly being used by fashion retailers to gain insights that fuel the strategy and marketing implementation of the fashion retailers (Cox 2011). From the customer point of view however, analytics are not top of the mind and perhaps not really considered as technology. This is associated to visuals: analytics technologies often take the form of sensor devices and the screen or interface can been seen only by the fashion retailers' staff (Niemeier et al. 2013; Brynjolfsson et al. 2013).

This invisible technology may be the one reason why analytics technologies are not prominent for customers, and thus are not something that can be experienced.

Digital signage in fashion stores appears to be more prominent to customers compared to other non-interactive ones (Schaefller 2008). The non-interactive technologies that are used to convey advertising and marketing messages are mostly in the form of digital signage (Dennis et al. 2013). This type is also the most commonly applied in-store technology in fashion stores (Dennis et al. 2012; Maloney and Cope 2016). It is basically a digital screen that has an installed system and can be designed according to a specific objective for conveying messages that can influence store visitors (Burke 2009; Muller et al. 2012; Bawarsky 2016). This type of device could convey messages, from a basic promotional marketing message via static images or motion images (Kent et al. 2015; Maloney and Cope 2016). Some examples of digital signage can be seen in the images below.
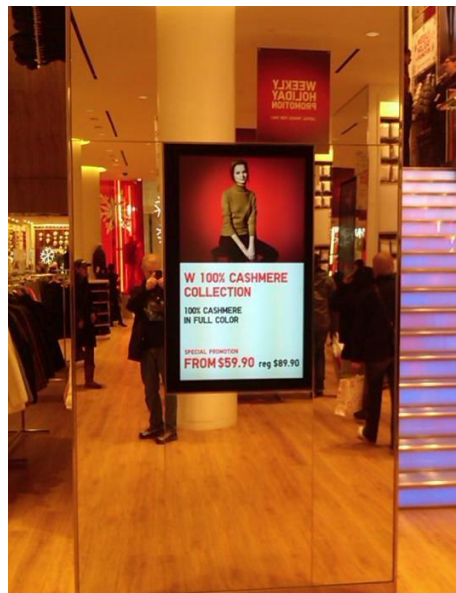
Image 1. Promotion type digital signage - Uniqlo, London

Image 2. Presentation type digital signage - Burberry, London

According to many studies, digital signage can provide numerous advantages for the fashion retailers and their physical stores. For instance, a study in the area of psychology and marketing conducted by Sherman et al. (1998) concluded that digital signage can increase positive emotions for store visitors. As a result, it can increase the possibility for purchase. Digital signage, with the mediation of positive emotion and cognition, can also increase positive attitude towards the store (Burke 2009). Store visitors would feel that they were given the relevant information and aided their shopping (Burke 2009). A more recent study by Dennis et al. (2014) provides additional insights, stating that digital signage can evoke sensory and affective experiences.

The findings from those studies suggest that the use of technology with high visibility and informative content can heighten the overall physical store experience. With this consideration, it can be assumed that interactive technologies provide more benefit for fashion retailers.In the digital world, along with the digitally confident consumers, interactivity is probably one of the most important traits of a marketing object for consumers. Interactive objects/devices can make consumers to be in an active position; feel to be involved and likewise, to be in control (McMillan and Hwang 2002; Varadarajan et al. 2010, Mintel

2017). Other than that, interactive technologies are able to open more possibilities for a mutual relationship between brands and consumers via two-way interactions (Merrilees and Fry 2002).

Before moving further into the review on interactive technologies, this review emphasises that digital signage still provides benefits for fashion retailers' physical stores. Digital signage is non-interactive thus making consumers less active as they could only perceive and experience all the information from the content passively. However its presence plays an important role for the physical stores' atmospherics. This is reviewed in the next section.

2.3.2 In-store technologies as atmospherics

Wherever one is present, it is believed that the surrounding environment influences one's behaviour. With this understanding applied to a fashion retail context, the environment in a fashion store can also affect the store visitors or consumers. The physical store elements that can influence consumer behaviour are known as atmospherics, The term was coined by Kotler (1974), and refers to the ways in which environment can be designed, manipulated and controlled with the aim to of positively influencing store visitors or consumers. Going back to the previously reviewed digital signage, it can be argued that non-interactive technology is part of atmospherics (Dennis et al. 2012; Ballantine et al. 2015). Digital signage can clearly be seen; its physicality and content on the screen form visuals influencing store visitors or consumers (Ervasti et al. 2016).

Since digital signage is part of atmospherics, it should be perceptible to human senses. The term atmospherics therefore can only be applied to the store elements that are perceptible. Thus merchandise is part of atmospherics, as are lighting and temperature (set by heaters or air conditioners). In the case of

wireless fidelity (wifi) or analytics, they are not part of atmospherics, because the last two are not perceptible by the human senses.

This shows strong interaction relationships between a human's perception and the environment in which one is presented. Visual (sight) is arguably the main sensory perception to describe and process store's atmospherics, followed by auditory (hearing), olfactory (smell) and tactile (touch) (Spence et al. 2014). The possibility to shape consumers' feelings, intentions and behaviour to some extent through atmospherics design, strongly suggests that it is imperative, thus fashion retailers should take them into account for designing and implementing their physical store atmospherics.

Prior to Kotler's (1974) atmospherics, there were studies that have examined the influence of a retail store environment on human behaviour, but they have focused predominantly on shelving control (Cox 1964; 1970; Kotzan and Evanson 1969; Frank and Massey 1970). Mehrabian and Russel (1972) introduced an environmental psychology approach into this field. Employing the stimulus-organism-response paradigm, they put forward the pleasure-arousal-dominance (PAD) model as a means to measure the effect of surroundings on human behaviour. The model highlights emotional factors as the mediator of the interaction between stimuli and people.

Subsequently, many physical stores or atmospherics studies have employed Kotler (1974) and Mehrabian and Russel (1972) as their theoretical and conceptual framework. Donovan and Rossiter's (1982) study specifically adopted an environmental psychology approach for the retail context. They applied Mehrabian and Russel's (1972) PAD finding that the store environment had a positive impact on consumers' intentions. Baker, Grewal and Parasuraman (1992) conducted a study in the impact of store cues on quality inferences and image of the store. A typology was proposed, and it comprises of 3 distinct cues, which are: design, ambient and social. In an exhaustive study concerning the role of

atmospherics on shopping behaviour, Turley and Milliman (2000) reviewed literature in the atmospherics area, subsequently categorised store cues into 5 proxies. Similar to Baker, Grewal and Parasuraman (1992), they regard human factors (social) as one of the aspects that may affect consumers' behaviour inside a store. Other than that, they put forward; exterior, general interior, layout and design, POP and decorations. These 5 proxies jointly comprise of 57 cues.

In a more recent study, Ballantine, Parsons and Comeskey (2014) re-examined Turley and Milliman's (2000) typology, from which they argued that out of the 57 details, only 19 of them were salient, with the potential to influence consumers.

Atmospherics is particularly important for fashion retail stores. Compared to other retail stores, fashion stores rely on visual aesthetics and creativity for its selling point (Baker and Bailey 2014; Bain 2016). In fashion retail field, one of the earliest studies that have covered atmospherics comes from Yalch and Spangenberg (1990), which is an examination of consumers' shopping behaviour affected by music.

In the light of technology, it is clear that in the past decades, fashion brands have embarked on utilising and installing technology for their stores. In-store technology is effectively part of a store's atmospherics. It naturally can be designed and controlled to influence consumers, thus along with others jointly constructing atmospherics of a fashion store. An important point to be restated is, a fashion store's atmospherics should manifest clear stimuli and able to be perceived with human senses (Kotler 1974; Berman and Evans 1995). In-store technology as atmospherics cue, is thus should be a technological system that could be described in terms of sensory; the technology should have clear visibility and is able to be perceived.

To take digital signage again as an example, it can clearly be seen from both its physical format; the shape, the material, the colour; and the displayed

information content. However, this is not the case for wireless fidelity (Wi-Fi) or a beacon system: both are connecting systems that can only be fully function when used together with other devices (The Economist 2015), but they are not perceptible. Store visitors may be able to see a wifi router but impossible to see the network itself. Despite its considerable advantageous functions, thus, such technology system cannot be regarded as part of atmospherics.

The preceding earlier studies of atmospherics however had not particularly mentioned the role of technology, its position and how it would fit within atmospherics. From Baker et al.'s (1994) category, it could be placed within ambience and design. From Turley and Milliman's (2000) typology, in-store technology appears to be situated within in-store and decoration category. Of the many studies in atmospherics only a few studies have counted in-store technology as part of atmospherics (Ballantine, Parsons and Comeskey 2014; Poncin and Ben-Mimoun 2014; Dennis et al. 2012; Verhoef et al. 2009). Dennis et al. (2010; 2012; 2014) have examined digital signage application as part of an atmospherics in retail settings. One of the findings indicates that the installation of digital signage could create a positive perception towards its environment; thus consumers perceive the retail setting as modern and up-to-date (Dennis et al. 2012). The studies had been conducted in shopping malls, which means a much larger scope with a relatively minimum stimuli. It also shows a less contained atmospherics environment, which may not account for all the additional factors that might have influenced the results.

Poncin and Ben-Mimoun (2014) have also conducted an empirical study in the impact of visible technologies in a physical store. The digital technology studied was an augmented reality (AR) system and an interactive tabletop in a toy store. The findings show that these technologies generate a positive perception towards the store and may influence buying intention, even putting aside its interactivity (Poncin and Ben Mimoun 2014). The fact that visible in-store technologies can be perceived and experienced by store visitors or consumers,

means that they contribute to the store's atmospherics. As such, visible or perceptible in-store technologies form atmospherics and can be used by fashion retailers to influence consumer behaviour.

There is one particular trait that forms an essential part of visible technologies: digital signage. Apart from its presence within the store's atmospherics, it also embodies its own atmospherics: digital atmospherics or micro atmospherics (for consistency this research uses digital atmospherics in the remaining text). What follows is the review of digital atmospherics.

2.3.3 Digital atmospherics

The elements forming the content system of digital signage can be regarded as digital atmospherics. Usually, digital atmospherics elements emulate physical atmospherics elements (Ha, Kwon and Lennon 2007; Katrandijev and Velinov 2014), but the most important aspect is the characteristic of the digital atmospherics itself; similar to (physical) atmospherics, the digital one is perceptible predominantly via the visual sense. Store visitors or consumers are able to see what is on the screen of the digital signage either, static or moving. For this reason, it can be argued that all the content elements of digital signage form the digital atmospherics. Already fashion consumers appear familiar with digital atmospherics because they can perceive and experience digital atmospherics via their personal devices, for instance accessing a fashion mobile website via a mobile phone (Kim and Lennon 2010; Magrath and McCormick 2013). Such a condition seems to increase the possibility for consumers to take notice of digital atmospherics on digital signage.

An early study of digital atmospherics comes from Ha, Kwon and Lennon (2007), in which they explore the elements of apparel retail websites, subsequently creating a classification. Employing content analysis and guided by Kerfoot,

Davis and Ward's (2003) framework of fashion visual merchandising, they identify three primary elements. The first is environment, which refers to the general character and atmosphere presented. Colours, sounds, signage are the examples that constitute this element. Manner of product presentation is the second element, and it accounts things like, product display, detailed views, and options. The last element is pathfinding assistance, which refers to assistive tools such as, search, site map, filter and tabs.

This classification reflects some similarities with physical store atmospherics. For instance, colours and sounds in a mobile application may be associated with wall colour, flooring and music in a physical store. Product presentation is clearly similar to that in how products are hanged or displayed in a store. Likewise, assistive tools appear similar to a physical store's category label, wayfinding sign, and directions, among others. Of those three elements, the manner of product presentation has been suggested by the majority of studies to be the most important element (Ha, Kwon and Lennon 2007; Jeong et al. 2009; Kim and Lennon 2010; McCormick and Livett 2012).

Aesthetic presentation of online visual merchandising is similarly important. The product presentation of a website should be able to be moved. This is to enable the user to see different angle of the product itself (Khakimdjanova and Park 2005; Yoo and Kim 2012; 2014). Three-dimensional (3D) rotation with or without the use of model able to increase the aesthetic perception and leads to purchase intention. All of these can happen because the product presentation movement can increase the feeling of touching the product directly or called "sensory information" (Khakimdjanova and Park 2005; McCormick and Livett 2012). This points out again how the digital atmospherics are still connected closely with the (physical) atmospherics. On both physical and digital, other elements may be paramount and studies show that merchandising is the most important (Koumbis 2014; Ballantine et al. 2015). For that reason, it can be argued the merchandising,

mainly digital and online, should be art directed accordingly so that consumers would be able to perceive and experience it better.

A well-crafted product presentation can also influence consumers to feel more confident of the real product quality and enjoyment at the same time (McCormick and Livett 2012). All of which may lead to a positive brand – consumer online interaction. There are two essential elements within product presentation: they are functional product viewing and aesthetic fashion information. The former points to all aspects that relate to how a product is presented and viewed. Instances of these are product display with a model or on a flat surface, and how it can be scrutinize with an interactive rotating and zoom tools. The latter refers to additional information that would enrich the product viewing. Typically, the nature of the information is a suggestion or more specifically "style advice". This takes the outputs such as, latest trends, inspirational people, mix and match tips. A note, images, videos or text are not exclusively applied to one of the elements, as it is possible to see these types of format in both product viewing and fashion information. It is the essence of the message that differs between the two elements. Yoo and Kim's (2014) study similarly suggest that online product presentation along with the viewing or exploration tools are significant. How large product images along with a good photo quality could affect the perceived product quality of consumers, subsequently escalates to a purchase intention. The capability of viewing details interactively, for example, through enlargement and rotating tools, is once more asserted.

The review on literature regarding digital atmospherics, demonstrates that an interaction between human and stimuli - a consumer and atmospherics - is the most fundamental aspect. It is the manifestation of human perception towards the environment. As reflected in studies on both physical and digital atmospherics, interactivity centres in nature to have a control over stimuli.

Interactive in-store technologies are more likely to facilitate digital atmospherics (Park, Stoel and Lennon 2008; Kim and Lennon 2010; Wu et al. 2013). This argumentation appears rooted from the nature of a physical store of which one should be able to explore and interact with the presented surrounding, for example touching merchandise (Ha, Kwon and Lennon 2007).

The illustration shows a sense of presence and active interaction between human and environment, which also seems to be in the centre of atmospherics concept (Kotler 1974). With this thought, it can be argued that a non-interactive technology is able to establish its own atmospherics, but store visitors or consumers can only be reactive towards it (Dennis et al. 2010). Interactivity is therefore key to a higher degree of experience on digital atmospherics.

This notion shines a brighter spotlight on interactive in-store technology. Not only can it gratify the digitally confident consumers' demands for active participation, but it may also create a stronger effect in the store's atmospherics and digital atmospherics. Many studies and market research statistics suggest that fashion retailers are increasingly installing technologies beyond digital signage, that is interactive technology (Bonetti and Perry; Mintel 2017). In today's seemingly digital world, interactivity is probably one of the most important aspects in technology to help build relationship with consumers (Varadarajan et al. 2010; Hamilton et al. 2016). Most consumers tend to like to be in an active position; feel to be involved and likewise, to be in control (McMillan and Hwang 2002; Hamilton et al. 2016; Mintel 2017). Interactive technologies are able to open more possibilities for a mutual relationship between brands and consumers (Merrilees and Fry 2002; Huang and Liu 2014). The next section reviews interactive technologies in fashion stores.

2.4 INTERACTIVE TECHNOLOGY (IT) IN FASHION STORES

Interactive technologies have a basic function that is similar to digital signage (non-interactive): conveying advertising and marketing promotion messages. Regarding their physicality, most interactive technologies can look similar to digital signage. Store visitors are able to see the digital screen and its colourful content. At times interactive technologies can look different however, for instance, a magic mirror or a virtual reality headset. But what significantly differentiates interactive technologies from the digital signage is its interactivity; interactive technologies can be used by store visitors to engage further with the fashion brand and its messages (Kent et al. 2015; Bonetti and Perry 2017). Unlike digital signage that displays information so store visitors can perceive and experience it passively, interactive technologies afford store visitors to be active (Alexander and Alvarado 2017). Thus the interactivity trait elevates interactive technologies higher from digital signage and other non-interactive technologies.

As stated in the introduction and rationale in chapter one, this research focuses specifically on interactive technology in fashion stores. Essentially, it has a touch screen, specific content system, navigation tool and system and installed in a particular area of a physical fashion store (Kent et al 2015). Given its specificity, for the remainder of the review and throughout this research the term interactive technology, abbreviated as IT is used.

Interactive technology (IT) is an interactive technological system and/or device with an interface installed in physical stores and typically has a particular function (WGSN 2016; Pantano and Di Pietro 2012; Kent et al. 2015; Bonetti and Perry 2017). IT generally functions as an information provider and a shopping assistant (Pantano and Naccarato 2010). Other than that, IT is increasingly being utilized as a tool to provide entertainment for store visitors or consumers (Kent et al. 2015; Alexander and Alvarado 2017). It can be argued therefore that IT can be

designed for gratifying utilitarian needs (e.g. as a shopping assistant) and hedonic needs (e.g. entertainment) for store visitors.

IT that is designed to gratify utilitarian needs is generally product-centric. In this type of IT, the merchandise being sold can be clearly seen in the system content (Kent et al. 2015). Detailed information regarding the merchandise is also normally comprehensive. Other than that, additional functions such as customisation may also be found. Fundamentally, product centric IT is designed for increasing the likelihood of purchase (see image 3 below).
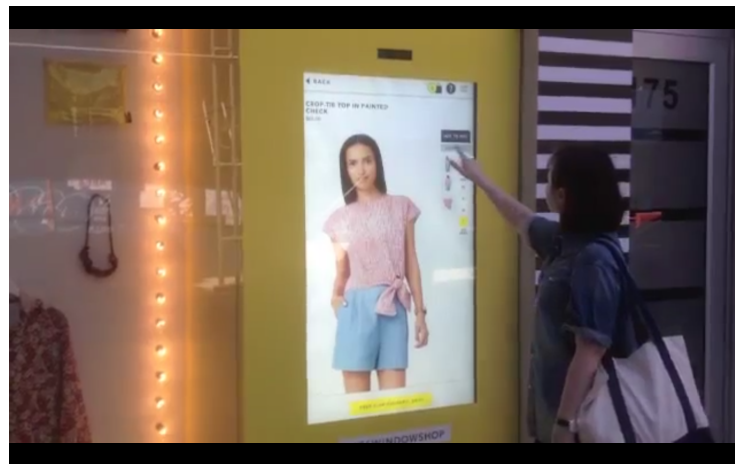
Image 3. Product centric IT - Kate Spade, New York

IT that is designed for consumers' hedonic needs is experience-centric at the core of the content system. Normally, the merchandise is not shown as a display, rather it is infused into a storytelling or gamification content. This type is designed not for increasing sales, thus more for "soft-selling". That is why the experience centric IT aims more for providing users with epistemic and novel experiences. The detailed information can be very limited as it puts forward the idea or story. To increase the intensity of enjoyment and hedonic feelings for the users are the primary purposes of this IT type. An example of experience-centric IT can be seen in image 4.

Image 4. Experience-centric IT - Uniqlo, London

In the previous section it was shown that non-interactive technologies, chiefly digital signage, play a role in physical store atmospherics; via their physicality and content systems in atmospherics and digital atmospherics (Pantano and Naccarato 2010; Dennis et al. 2012; Ballantine et al. 2015). These are stimuli that can be perceived and experienced by store visitors (Ballantine et al. 2015). Considering the presentation is akin to digital signage, IT can also be regarded as part of physical store atmospherics. As well, IT forms both (physical) atmospherics and digital atmospherics.

Through its interactivity IT can work as a customer service facing technology (CSFT) (Kent et al. 2015). This is beyond IT's contribution to atmospherics in physical stores. A CSFT can provide store visitors information, but most importantly it can provide the information according to the store visitor's needs. While digital signage normally can convey only one message, IT as a CSFT can provide more messages of which can be retrieved according to the IT user's needs (Di Rienzo et al. 2015). Thus it can be stated that IT has two functions: first, to serve as atmospherics (physical and digital ones) with its physicality and visibility and second, to serve and engage store visitors with its interactivity.

To restate, IT in this research refers to a technological system that has a touchscreen as the interface to navigate the content. This means that whatever

the system contains, the way to navigate is by touching the screen. The touchscreen can be in the form of general digital screen (either vertical or horizontal) or can be blended with the environment, for example, in a magic mirror. Some examples of these can be seen in images 5 and 6.

Image 5. Digital rail - Marks and Spencer, Amsterdam

Image 6. Magic mirror - Tommy Hilfiger, London

Some interactive technologies however, can have another usage. The user does not have to touch the screen in order to navigate. For one, with the use of sensor for receiving navigation input from the user. Sensor based navigation for interactive technologies can be set accordingly for the interaction. It can be set automatically so the content system would react when detecting the movement; one example of this is the interactive rail; when a garment is moved from the rail, the screens installed above would automatically play the content. The content is

normally a short film or some images showing further information in relation to the moved garment. Another sensor-based navigation for interactive technologies is by navigating without actually touching the screen (see image 7).

Image 7. Sensor based (kinect) navigation - Topshop

Only a few studies have covered fashion stores' in-store technology. These include the use of AR technology for changing rooms (Huang and Liu 2014), experiential in-store technologies (Kent et al. 2015) and customer facing technology in fashion stores (Bonetti and Perry 2017).

From the perspective of multichannel shopping experience, Blázquez (2014) has conducted a study on the role of technology in enhancing a fashion store's experience. The study implies that In-store technology opens up a chance for consumers to acquire more information, including reviewing, and to be socially connected. This indicates that it should not be seen primarily as a facilitator for the end of the journey, but as an effective experience conveyor within the whole process. As such, in-store technology plays an important role within leveraging a high quality customer experience. An active simulated shopping experience will generate a higher experiential value (Huang and Liu 2014). As such a simulation effect through an interactive virtual space is important.

Interactivity is often being associated with the term experiential. Interactive in-store technology in retail settings typically provides a task-based function or a

combination of entertainment and task-based function (Kim and Forsythe 2008). An example of the former is a product finder, whereas an example of the latter is a digital changing room, which has a basic function but can be experienced in a fun way. In some other cases, it would even be possible to see an interactive technology that provides a full entertainment-based function, such as an interactive game (Akpan et al. 2013). In such cases, the aim of the IT is solely to entertain people, in this regard, consumers, with the expectation to make them feel and experience pleasure and enjoyment. This type of IT seemingly would be more relevant for consumers with hedonic background, although it may be possible for utilitarian to engage as well (Scarpi et al. 2014). From these types of in-store technology, it appears that interactive types are more likely to be employed as an experiential technology (Kent et al. 2015). One strong reason it is considered as more probable to give an experiential value is because it gives consumers a sense of control and stimulation through physical actions (Kim et al. 2013). Engagement study from O'brien and Toms (2008) state that active participation through human body movements would naturally form a higher experience. A sense of collaboration would also be established from the consumers' participation within the marketing entity, which would enhance an experience (Mathwick et al. 2001).

To summarise this section, IT content system can be designed as product-centric and/or experience-centric. The product-centric IT allows the user to get information of merchandise and purchase it. This type can more fully gratify the utilitarian needs of the IT users; meanwhile, the experience-centric IT focuses more on providing experiential entertainment for the users. Other than that, it can be argued that interactive technology in a fashion store has two distinct functions. The first is, it contributes to the atmospherics of a fashion store, subsequently shapes feelings, intentions and behavioural action towards a store, product or brand, through perceptions (Dennis et al. 2012; Ballantine et al. 2015). Secondly, it potentially serves as a device to assist or support consumers as well as to heighten their experience (Huang and Liu 2014; Kent et al. 2015). An

important trait that fuels all this is evidently the interactivity of IT. Thus IT is one important element for physical fashion stores given its capacity to be multifunction. In the next section, the essential trait of IT: interactivity is discussed.

2.4.1 Framing interactivity

The term interactivity is derived from interaction, as seen in the behavioural interaction theory in Sociology (Johnson, Bruner II and Kumar 2006). Interaction commonly relates to actions between an individual or group who adjust the actions and responses that follow according to the partner's response in the process, which occurs in an active order (Turner 1988). The word also refers to reciprocity, similar to Goffman's (1967) mutual action that can be understood as an activity of providing advantages to each other within a society.

Interactivity has been more widely discussed since the advent of computer technologies in the 1980's (Varadarajan et al. 2010) and became more prominent with the proliferation of the Internet (Kaplan and Haenlein 2010). Interactivity is generally acknowledged as one of the traits of the Internet accessed via computers; people can input action and get immediate responses from the internet (Lanham 1993; McMillan and Hwang 2002; Wu and Wu 2006). With traditional media, with the likes of television and magazines, people cannot receive responses (Varadarajan et al. 2010). Consequently, interactivity is often used to differentiate between the new media and the "older" traditional media (Sohn 2011). In a world where digital technology permeates our everyday lives (Llamas and Belk 2013), interactivity has also been accepted by many as the key to control and employ devices to assist various daily activities (Varadarajan et al. 2010). These understandings suggest that technological products are the unifying factors that can provide interactivity.

General agreement of interactivity definitions however is still broad. For instance Kiousis (2002, p. 372) defines it as

> The degree to which a communication technology can create a mediated environment in which participants can communicate (one-to-one, one-to-many, many-to-many), both synchronously and asynchronously, and participate in reciprocal message exchanges (third-order dependency). With regard to human users, it additionally refers to their ability to perceive the experience as a simulation of interpersonal communication and increase their awareness of telepresence.

A product of communication technology is the focus on this definition. People are the actors of the communication, but within mediated interaction scope, the technological products dictate the level of the interactivity itself. After the products, the content and how people 'consume' and respond on it are factors that can further influencing the degree of interactivity. This is in line with the definition by Varadarajan et al. (2010, p.97): "methods, tools or devices that allow various entities (individuals, machines, organisations) to engage in mediated communication to facilitate the planning and consummation of exchanges between them". This definition imply that a response to an action is in the very heart of interactivity. As Naimark (1990, p. 455) puts it "… it is our input and its effect that distinguishes it from a non-interactive...". Rafaeli (1988, p. 115) similarly uses the term "action-reaction" that points to feedback in new media. In today's digital world, browsing activity such as a mobile interface responds to a finger tap, may be one of the examples.

Johnson, Bruner II and Kumar (2006, p. 41) focuses more on the content by defining interactivity as "the extent to which an actor involved in a communication episode perceives the communication to be reciprocal, responsive, speedy, and characterized by the use of nonverbal information". Here, it can be seen that feedback should be useful or beneficial to be regarded as interactivity.

From those definitions, it can be seen that the term interactivity is still being closely associated with interaction process between individual or group. As discussed in the earlier paragraph in this subsection, the reason behind this is partly because prior to the information communication technology (ICT) period, it was more common to regard interactivity as similar to communication (interaction). That is, a flow of two-directional information between sender and receiver that focuses on feedbacks (Johnson, Bruner and Kumar 2006). This implies that a face-to-face communication can also be called a process that carries interactivity, as long as it is happening in a sequence and with reciprocity (Rafaeli 1988). Nonetheless, interaction and communication should be regarded as two different actions. The former strictly requires two directional or multi-directional flow of information, while this does not apply to the latter. Furthermore, interaction is a process of reciprocity while communication does not have to be (Stromer-Galley 2000; 2004 Kiousis 2002).

Interactivity as a construct should be divided according to its trait and context or otherwise it may lead to an improper measure of interactivity (Stromer-Galley 2004; Lee 2000). With a differentiation, examining interactivity can be in a smaller focus but in a detailed fashion (Rogers, Sharp and Preece 2011). Stromer-Galley (2004) divides interactivity into two types, interactivity-as-process and interactivity-as-product. Interactivity as a process can be seen in the interaction between people, either mediated or unmediated, and may be called as the next stage of a communication process (Rafaeli 1988; Stromer-Galley 2004). A few examples are a conversation between friends in a café, a seminar session, a skype call interview or meeting and an email of work discussion. From these interactions, in a dependent manner, messages trigger response messages. While a flow of messages may be delayed or asynchronous, it is however, contingent because the messages are created by people.

With interactivity-as-product, a user interacts with an interface of a system on a technological device, the responses therefore are predictive and predefined by

the creators of the technological system (Stromer-Galley 2004; Rogers, Sharp and Preece 2011). Browsing a fashion brand application on a smartphone is an example of interactivity-as-product. Another one is when a person is shopping online from a laptop. However, should the person use the embedded social media tool or customer service chat facility it also becomes interactivity-as-process. This means that when a person is interacting with a technology, both types of interactivity might occur. The first one is the interaction between the person and the technological device and its system, and the second is with another person who is connected through the system.

Although there is a possibility of having a combination of interactivity types with technology, the possibility should strictly be delineated. One might argue that, for instance, when one uses a mobile phone to browse or purchase something, it is actually an interaction between brands and consumers, hence interactivity-as-process. However that is not the case, because what makes it form a sort of relationship is not the interaction per se, but the result of the overall interaction with the system. In effect, the person would perceive as if it was an interaction with the brand. Such a process has been reported by Merrilees (2016) in which he outlines the three levels of interactivity advantages. The lowest effect could strengthen consumers' understanding of a brand or product. The middle effect is it could help make a good brand or product impression. The last one is, interactivity would help build and enhance an online relationship between brands and consumers. Interactivity facilitates a hybrid communication of a kind; further it advocates an active participation from consumers and therefore provides a powerful competitive advantage (Bezjian-Avery, Calder and Iacobucci 1998; Varadarajan et al. 2010).

In sum, there are three distinct perspectives in the study of interactivity. The perspectives are the process, the function and the user perception. The studies that focus on the process centre on the communication process and how it could make possible interactions emulating interpersonal communication (Walther and

Burgoon 1992; Kiousis 2002). Meanwhile, those that focus on the function concentrate on interactivity as the attribute of communication technologies (DeFleur and Ball-Rokeach 1989; Song and Zinkhan 2008). The last perspective, which concerns user perception closely examines interactivity from the users' angle how they perceive it (McMillan and Hwang 2002). The only way to receive or acquire inputs of stimuli that will be interpreted is perception via the human senses. Perception can therefore be considered as a core element in an interaction (Sohn 2011). It should be noted how in a similar manner, perception is a key element in experience (Jantzen 2013). Intrinsically, an interaction becomes experience. This last perspective can be found mostly in the advertising and marketing related studies.

From the three perspectives it can be argued therefore that interactivity in general embodies function, process and perception involving technological products. The most important aspects however is perception. Understanding how consumers' perceive interactivity is more useful and practical, thus more important compared to looking at the process and counting features (Lee 2000; Sohn 2011). As Reeves and Nass describe it (1996, p. 253), ".... perceptions are far more influential than reality defined more objectively".

2.4.2 Perceived Interactivity

The degree of the interactivity between interactive technologies varies (Bolton and Saxena-Iyer 2009). The interactivity of a simple static website and a flash based website, for instance, attribute-wise differs greatly. This technical application evidently does not always lead to user perception as planned. A device and system may seem less interactive to a user, despite it being in fact a highly interactive one from a computer or software design perspective (Johnson, Bruner II and Kumar 2006).

The term concerning how a technological product can be noticed as interactive is known as perceived interactivity or affordance. A product can be highly interactive but people may not be aware. Opposingly, people may think that a product is highly interactivity where in fact technically it is limited.

Most interactivity studies highlight user control as a defining character of what can be called "interactive". But Johnson, Bruner II and Kumar (2006) suggest an opposing theory, that separates control from interactivity facets. Through an exhaustive literature review, measures and hypotheses testing, they posit that the interactivity construct is built from four facets, which are reciprocity, responsiveness, speed of response and nonverbal information. They concluded that these facets would influence user perception of interactivity.

Those facets of interactivity however depends highly on content quality. As suggested by Song and Zinkhan (2008), the message or content quality is the primary reason of a good perception of interactivity. They provide an example; a website content that can be personalized leads to the perception of interactivity. How consumers engage and manipulate the message or content might lead to a state of active control.

The design interface and system of a technological product able to show the degree of its interactivity. Pares and Pares (2001) put forward that there are three levels of interactivity; explorative, manipulative and contributive. In the explorative mode, a user can wander and explore what is presented in the digital environment. This can further be divided into two subtasks. The first one is called travel that refers to every possible movement in the digital space. Such movement does not always lead to a next step or path because it includes free movement, such as those in mouse pointer position or scroll. The second is wayfinding, which means all navigation decision based on taps or clicks made by the user. The manipulative level affords a user to actually interact and control some elements in the digital environment. Typically though, the manipulative

affordance is limited, which means the elements cannot be fully modified. The last level of affordance is contributive by which a user can alter or produce elements for the digital environment.

While many studies indicated that the content and the responsiveness of a system are two aspects that can project the interactiveness of a technological product, what can been seen immediately form a product is in fact its physicality. The shape of a technological product and how it is placed and positioned can increase the perceived interactivity (Muller et al. 2014). People are already exposed with various types of media, especially those 'traditional' outdoor media, such as billboards and digital signage. Designing a device to look different from traditional media is one way to increase its interactiveness (Muller et al. 2012). Moreover, it should be placed and positioned differently, for instance by installing a product on a standee rather than on a wall (Brignull and Rogers 2003; Dennis et al. 2014).

Perceived interactivity is important as it is the first step that can make people use a technological product. The physicality should be taken into account first before designing the content design and the system. These can increase the interactiveness of a product. High perceived interactivity not only can intrigue people to use, but also their perception towards the content and system during interactions.

2.4.3 Interactivity in digital fashion

In the fashion context, it is clear that interactivity is paramount. It may have been known that fashion is indelibly linked to how one looks, specifically one's attire that encapsulates the identity, value, and messages to be communicated (Noorharini 2015). Fashion is thus something that needs to be primarily perceived through the visual sense (McCormick et al. 2014). This includes the vividness of

the creativity, style, and detail (Cheung and Vazquez 2015). Other than that, tactile sensory is of equal importance to ensure the quality and comfort of a product (Herhausen et al. 2015). All this underlines the importance of product presentation.

Visiting a store affords one to get all this, and additionally, touching a product to try it on directly. Undertaking such activities digitally would obviously require more effort given the constraints of the media. Fashion brands should ensure that their digital fashion marketing could convey as close as possible to a store experience (Verhoef, Kannan and Inman 2015). For that reason, how consumers perceive the product digitally is imperative. In the preceding section, it was explained that all online atmospherics elements are important (Ha, Kwon and Lennon 2007). In any case, the manner of product presentation should thus be placed forward. This is where interactivity plays a great role in augmenting the perception of the product presentation.

One instance, Kim and Lennon (2010) emphasise the necessity of product enlargement capability, with which may lead to aesthetic pleasure and positive perceived sufficient information. Moreover the possibility to manipulate and move a product/merchandise could bring about a positive attitude derived from positive affective and cognition, all of which would lead to a positive product quality and purchase intention (Park, Lennon and Stoel 2005; Park, Stoel and Lennon 2008). This can be achieved particularly, through 3 Dimensional (3D) viewing or various angles of moveable images. Other than that, interactive product presentation could evoke an experiential or hedonic quality through rich sensory experience (Jeong et al. 2009).

Fashion product searching and scrutiny through interactive technology, is often linked to a utilitarian background, and should be focus on efficiency therefore (Kim et al. 2013). However, this is not always the case as consumers may only undertake the interaction for inspiration or entertainment (Herhausen et al. 2015).

This means the underlying motivation is experiential because they are not consuming the product, instead the consumer consume the content (Jantzen 2013). It always possible however to have both utilitarian and experiential experiences at the same time (Hassenzahl and Diefenbach 2012). This point of view can be understood more clearly through user experience (UX) perspective, which will be reviewed in the next section.

2.5 IT FROM A USER EXPERIENCE DESIGN APPROACH

2.5.1 Interactive technology as a public technology

Unlike personal digital devices, an interactive In-store technology (IT) presents many different possibilities for interacting. Personal devices are obviously owned by their users and an interaction with personal devices is therefore clearly personal, despite the whereabouts of the users when using it. On the contrary, IT as part of store atmospherics, is planned, designed and implemented by fashion retailers. It may be allow for a consumer's personal use for a certain amount of time, however, given the nature of its presence, the installation can be used by everyone, and it can be said that it belongs to everyone thus becoming a public device (Chen et al. 2014). This may raise challenges for fashion retailers. Within this section, interaction design and human computer interaction (HCI) literature are employed as the lenses to discuss the interaction between people and technology.

There are three types of engagement challenges to intrigue people to interact with a public display, which are: initial, ongoing, and public and internal nature (Muller et al. 2012). Initial engagement is the moment to intrigue and motivate people to approach and starting to interact. This is where ongoing engagement,

with a smooth transition, plays a part by showcasing an interesting aesthetic and user interface and most importantly a relevant idea or content.

Public nature is the surrounding, situation/space and place that affects ongoing engagement. These three challenges have been further elaborated in other interaction design literature with new terms; display blindness for the initial interaction, performative interaction for ongoing interaction, and meaningful interaction for public and internal nature.

2.5.2 Display blindness

The presence of interactive technology in fashion stores may seem apparent or perhaps even highly visible for some consumers. However, it does not always invite them to interact with it or approach for that matter. This may be because consumers think that the IT is a basic digital display, which plays a looping video or motion graphic (Muller et al. 2012). Such conditions, where people do not notice or regard a display although it is visible is known as display blindness (Muller et al. 2011).

Display blindness can be mitigated by placing IT strategically at a highly visible and conducive space. Most importantly, it requires salient cues as attention grabbers to direct and briefly communicate the interactivity, function and its use (Marshall et al. 2011b). One example of a good positioning for interactions is when the IT was positioned near to a queuing area where its physical form and vivid display was likely to be seen by customers, and further emphasised by clear signage.

The installation plan of digital displays, particularly those that are interactive, recently received increased attention from fashion retailers (WGSN Feb 2016). The device is often implemented in strategic areas and adorned with additional

elements that signify its location. This would expand its vividness and thus become more perceivable by consumers.

2.5.3 Performative interaction

Interaction with an IT could create a situation that can be called performative interaction, in the sense there are other people surrounding it and spectators (Williamson et al. 2014). With respect to location (space, place, and situation), this interaction would pull consumers into a spotlight. In this vein, there is a conscious idea inside consumers' mind of being seen or in other words 'performing' while interacting in a public space.

Chen et al.'s (2014) study on how interaction with public displays became a performance, suggest that interaction with interactive displays will likely complement in shaping the interaction not only towards the technology but also the social surrounding. During such activity, the way a consumer acts as a user is driven by how they feel and think of what other consumers or people see and think about them. The user's 'performance' may in turn influence spectators' attitudes towards both the user and the IT, which iteratively would influence the user again. Within this process, it may be possible for the user to suddenly stop in the middle of the interaction simply because of an uncomfortable feeling, which stems from the thought that the spectators hold a negative view. It may also occur the other way around when the user succeeded in finishing the performative interaction because of the positive view of the spectators (Williamson et al. 2014).

2.5.4 Meaning in interactions

Relevance and value of the content on an IT for consumers are arguably one of the most important aspects of all. These aspects fuse and form what can be called meaningful interaction.

The influence of the concept space and place on people's engagement activities can be found in the 'shadow wall', a large interactive digital display, observed in ten different places (Akpan et al. 2013). One of the main findings suggests that place has more influence on creating engagement rather than space. In this regard, place refers to the relevance of the function and content of the technology with the situation, context and people in the vicinity. This implies that interaction in a low quality physical space can be improved with appropriate meaning and social context. Other studies however, underline the importance of physical aspects or space, such as room size, borders, flooring among others, that are elements that affect interaction with interactive public technologies and social interactions (Marshall et al., 2011a: 2011b). Both studies are actually rooted in Hornecker's (2005) view on the idea of embodied facilitation, which suggests that when appropriately interpreted and manipulated, a technology along with its relevance and space could shape the activities of people.

A study by Desjardins and Wakkary (2013) explores the relationships between goals, tools, materials, and competences within everyday design with the social interactions frame. They conclude that practice meaning is the strongest motivator for people's everyday practice and could influence their view towards materials, tools and competences. Other than that, comprehensive perspective of everyday design activities is crucial in order to have a solid based of research, and may lead to longevity. Similarly, in their recent study, van Waart and Mulder (2014) have focused on enriching people's lives in a city through meaningful interactions in which they argue that space in interaction design should have the capability to embrace individual level as well as wider level (public). As such,

previous studies have shown that an intriguing physical presence (Jetter et al. 2014; Boring and Baur 2013), a conditioned social presence (Williamson 2014); and relevance of a place and space are crucial factors in influencing the usage of interactive public technologies (Akpan et al., 2013; Marshall et al., 2011a). Taking these into account, providing meaningful experience and human values should also be in the centre of all interactions with technology (van Waart and Mulder 2014; Desjardins and Wakkary 2013).

2.6 FASHION CONSUMERS AND TECHNOLOGY

2.6.1 Defining Fashion Consumers

Fashion consumers have existed since a long time ago. The conspicuous consumption phenomenon in the late 19th century denotes one of the most prominent fashion consumption periods (Sparke 2012). It happened partly as a result of the industrial revolution, whereby producers or sellers were able to produce mass products coupled with an improving economy, which resulted in the increasing buying behaviour of consumers. Fashion as an identity however has been found prior to that. For example, the adoption of high-heeled shoes and epaulettes was found in the 16th century (Noorharini 2015). Moreover, a classic study by Kohler (1930) found how people were competing for a leather-based clothing dated back to 9th century. All this illustrates how fashion has been consumed since the earliest age of mankind.

There are many definitions of fashion. Fashion is fundamentally a set of symbols that are use by an individual to relate with the society in which they belong to (Miller, McIntyre and Mantrala 1993; Graham and Anouti 2018). These symbols may be signified from objects that are worn, and the behaviour of the wearer. Fashion naturally applies to everyone. In a much earlier time, it is interesting to

note how behaviour, or gesture that relates to action and manner, was also part of the concept of fashion (Evans 1989; Wolbers 2009).

This concept has somewhat shifted, and gradually, fashion is known more as something that is worn by an individual (Solomon and Rabolt 2009). Fashion has become an instrument for building a self-concept and self-expression (Belk 1988; Evans 1989; Kaiser 2012) that transcends its functional value. It was used traditionally to present an identity that helps to connect with a society, but eventually it has become a tool to differentiate individuals from others (Miller, McIntyre and Mantrala 1993; Kaiser 2012).

Given one of its functions as an identity differentiator, fashion became something that is linked to newness. Although it may not be applied in general, many younger people feel the urge to be aligned with the latest fashion trends. As such, constant information and inspiration searching that could be adopted for identity building, as well as self-expression are considerably the fundamentals that fuel fashion consumers (Parrott, Danbury and Kanthavanich 2015).

2.6.2 Technology in Fashion Consumption

As might be expected, fashion consumers constantly seek for information as a means to keep up with the latest fashion trend. Prior to the advanced technological period, they typically obtained information from traditional media or mass media such as, television, radio, newspaper, and magazine (Sproles 1981; Lea-Greenwood 2013). Besides media articles, much fashion related information provided came from print advertising (Solomon and Rabolt 2009). Additional forms of advertising are window display, wall poster, billboard, artwork, among others. It has long been known that people could only be passive when 'absorbing' advertising from brands through these traditional media (Jefkins and Yadin 2000), as they are exposed only as a communication receiver.

People as consumers can choose the most relevant media, that suits them best; they could always select a more fashion-oriented magazine, such as Vogue, for instance. This may position consumers in control, thus opening up a chance for a higher involvement with information (Wolbers 2009). Consumers are able to control how long they would like to see, analyse and enjoy information on each page, before flipping to the next one. Nevertheless, they are only able to interact with the message passively, in the sense they can act towards an already provided message as opposed to selecting their own.

It was the advent of the Internet, with the World Wide Web (www), in the late 1990's that has greatly transformed the way consumers engage with information and fashion. Shortly after its inception, the Internet with its World Wide Web and applications, afforded consumers the opportunity to shop digitally as well as obtain information and entertainment in an interactive way (Solomon and Rabolt 2009; Nobbs, Moore and Kent 2013; Kim, Yoon and Han 2014). With this they would be able to choose information they like to receive and interact with it with greater power.

It can be argued that consumers' relationships with technology became stronger following the rise of the smart mobile device, which includes mobile phone, tablet and laptop among its types (Wang, Liao and Yang 2013; Llamas and Belk 2013). In the earlier days of each of these devices, they could only perform basic functions. For example, in 1995, mobile phone could only be used for calling or texting someone. Each format, mobile phone, tablet and laptop, has separately revolved at a different pace. The beginning of 21st Century may be considered as the birth of the smart mobile devices; a more advanced technology coupled with wireless Internet connectivity (Zamfiriou and Despa 2013). These devices enable consumers to do things that were traditionally bounded by time, location and context. Interactive media afford consumers to explore and select the content they need (Varadarajan et al. 2010). Thus, the interactivity of a medium or platform should be utilised further, as it can give consumers a higher sense of

control not only with information but also with the medium itself. The interactivity trait also points to the significant differences from traditional media.

It has been apparent that the rapid development of digital technology, including systems and devices, offers consumers new ways to engage with fashion. Many studies suggest that online shopping has been increasing in the past few years (Hahn and Kim 2009; Hsu, Lin and Chiang 2013; Wu et al. 2014; Herhausen et al. 2015). Despite this, it is clear that most consumers go online to be well informed and to acquire new knowledge (Penz and Hogg 2013; Voropanova 2015). In this regard, it is being in the know of the latest fashion trends (Parrott, Danbury and Kanthavanich 2015).

Such information seeking may finally lead to an actual purchase, although browsing and buying should be seen separately as different activities (Bloch 1983; Brown, Pope and Voges 2003; Herhausen et al. 2015). Looking through websites does not always proceed in linear steps towards purchase. In one case, a person could extensively browse a particular online fashion store, for instance ASOS, through their smartphone with the only aim of getting an inspiration for mix and match fashions. In other case, a person could go to a website and purchase products shortly after only a brief review. As such, it should be emphasised that fashion engagement through technology does not always have to end with a purchase and often is more about being digitally connected; being informed, entertained and having a social presentation (Burke 2002; Shang, Chen and Shen 2004; Penz and Hogg 2013; Hoffman, Novak and Stein 2013)

Being 'up to date' or current lies in the centre of the motivation of most fashion consumers, and this knowledge is associated strongly with how they present themselves in daily lives (Bullingham and Vasconccelos 2013). In addition to its function as an information source and e-commerce, digital channel, with its platforms, provides a new place to express and present themselves to others through many platforms (Hoffman, Novak and Stein 2013; Kretz and de Valck

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2013; Parrott, Danbury and Kanthavanich 2015). Consumers are able to 'publish' themselves in many formats like text, video and mostly photo (Kretz 2010; Llamas and Belk 2013; Belk 2014).

Hoffman, Novak and Stein (2013) introduces the 4Cs of digital consumers in social media, which comprises connect, consume, create and control. Consume may be the fundamental motive that is always present during digital interaction. Create may be considered as another essential trait for fashion consumers, and it takes many forms. For instance, Instagram, as the most favourable social networking for fashion consumers (The Business of Fashion 2016; Mintel 2017), is being used to show how they look to a particular group in their network. This presentation extends to showing collections they have, friends they hang out with, places they have visited, and other self-expression activities. In addition to that, writing reviews in websites and responding to threads or articles, which not only may assist others but also would demonstrate their position and knowledge as fashion consumers (Parrott, Danbury and Kanthavanich 2015).

2.6.3 Omnichannel and in-store behaviour

Many fashion consumers are becoming more familiar with digital interaction; and fluently use devices and platforms (Llamas and Belk 2013; Blázquez 2014). Despite this, they still continuously use other channels, particularly physical stores (Herhausen et al. 2015; Pauwels and Neslin 2015). Consumers however do not have a specific pattern of channel usage, except they use them simultaneously and interchangeably (Blázquez 2014; Verhoef et al. 2015). In other words, the way consumers use and shift between channels is rather unpredictable. This indicates that fashion brands should not only focus on one particular channel, as it is more about integrating channels consistently. Moreover, consumers who are more experienced and dedicated in using technology tend to have a stronger expectation towards this consistency.

That suggests that it is important to apply technology inside stores (Newman and Foxall 2003; Verhoef et al. 2009; Kent et al. 2015). In response to this, fashion retailers have been applying interactive technology as part of their effort to align with consumers. With interactive in-store technology, consumers would be able to undertake typical online activities, such as browsing, reviewing, and of course e-commerce (Kent et al 2015). Using technology inside stores affects how consumers search, compare and choose products, and most important, new way of interacting with the brand and products (Pantano and Naccarato 2010).

It is, however, still somewhat difficult to predict the pattern on how consumers actually use in-store technology and to understand the kind of technology they need the most. In some cases, although in-store technology is presented, consumers seem to be more comfortable in using their mobile phone (Lazaris et al. 2015). Familiarity with devices may be one of the main reasons for the attachment (Llamas and Belk 2013), thus it clouds an openness to use the in-store technology. Further, consumers often view technology as something that needs to be learned and accustomed to, which usually takes time (Burke 2002; McCormick et al. 2014). Younger consumers within 18-24 age bracket may be more prone to explore technology but in general it is still often be perceived as complicated to use (Burke 2002). This raises a challenge to design a more easy-to-use type of in-store technology (Evans et al. 2001).

Most consumers used digital technology mostly to look through information details about products and to easily compare prices within a product category. The final purchase would be done mostly at physical stores, and after they tried the desired products directly (Burke 2002; Mintel 2018). This aligns to the scenario of showrooming whereby consumers visit physical stores to see, touch and try products directly before buying it online (Comscore 2017; 2018).

In more recent years consumers still use it for the same activities, but this time they are able to do the searching and buying with in-store technology (Lazaris et

al. 2015). Traditionally they purchase products online, which means not in stores, but in-store technology enables them to proceed within the store instantly. This clearly shows that they have options to pay directly at a till or online through an in-store technology (Lazaris et al. 2015). Online prices may be lower than offline, which are normally expected by consumers (Lazaris et al. 2015), although it is unclear if this could be applied with in-store technology.

It appears that in-store technology has been employed more for utilitarian motivation and activity, rather than to elevate hedonic or pleasurable shopping experiences (Blázquez 2014). Default conditions however should also be taken into consideration. Findings from previous studies may stem from a condition where most in-store technologies present in fashion stores are in fact functional and not experience oriented (Mintel 2018). Digital engagement has been shown to lean more towards utilitarian based activity, while by contrast consumers with hedonic or experiential motivation often visit physical stores (Pauwels and Neslin 2015). It may be said that this illustrates fashion stores with embedded technology could accommodate both motivations, as it embodies both offline and online traits.

Fashion shopping is often associated with positive feeling and enjoyment. The term shopping itself already reflects the pleasure one might feel during and after the process. Interestingly, a large number of studies have examined fashion shopping based on the differentiation of the hedonic and utilitarian motivation behind shopping (Arnold and Reynolds 2003; Rintamaki, Kanto and Kuusela 2006; Scarpi 2006; Bridges and Florsheim 2008; Scarpi 2012; Scarpi, Pizzi and Visentin 2014).

Utilitarian motivation is normally associated with task or goal oriented shopping, thus it is not pleasurable (Scarpi 2012). There are an increasing number of views, which highlight the presence of enjoyment or pleasure regardless of the motivations (Diefenbach and Hassenzahl 2011; Hassenzahl et al. 2013). This

points to the possibility that a goal-oriented task could be pleasurable as well. Pantano and Naccarato (2010) categorise five steps of shopping experience or decision making, which are influenced by the presence of technology. Although it may seem to have a utilitarian base, they argue that the decision-making process can be more enjoyable, intriguing and fun with the support of in-store technology. Increasingly other studies have brought up the experiential side of fashion shopping in general, which points out that experiential value could be attained despite the motivation that underpins it (Mathwick, Malhotra and Rigdon 2001; Mathwick and Rigdon 2004).

User experience design concerns a holistic understanding of the users' cognition, affective and behaviour when using technological interactive objects (Forlizzi and Battarbe 2004; Hassenzhal et al. 2013). The field also takes usability, the core knowledge of human computer interaction (HCI), further. One of the core assumptions of UXD is that in order to provide a distinctive experience for the users an interactive technology should account for not only the ease of use but also the enjoyment side (Garrett 2010; Unger and Chandler 2012). As such, user experience design covers utilitarian and hedonic needs of the users (Rogers et al. 2015). This means that irrespective of the type of the technological interactive objects, the UXD addresses all aspects of the user holistically (Hassenzahl and Tractinsky 2006; Buley 2013).

Applying this to how consumers use marketing channels for fashion shopping, UXD can be argued to have the capacity in helping to understand all aspects of the channels that are connected with technology. Consumers used various channels for fashion shopping and they tend to switch between channels unconsciously (Diamond 1993; 2015). Other than that, although more recently digital channels are used more, consumers cannot be fully detached from other channels, including physical stores (Mintel 2017). What can be taken from this is that the interplay between channels is strong, therefore to focus on digital channels is to account for non-digital channels as well (Rosenblum 2012;

Stahlberg and Maila 2013). To restate, UXD as an approach to understand the interactions between consumers and interactive technology for fashion shopping covers aspects that are indirectly related with the technological device/agent (Hassenzahl and Tractinsky 2006). This is because UXD focuses more on the users, the consumers, thus any other elements surrounding the space and place in which the user is presented are considered (McCarthy and Wright 2004; Pucillo and Cascini 2014).

Although UXD field is still considerably new, there are several prominent frameworks and/or theories that have been employed in UXD based research. These can be quantitative or qualitative approaches. The nature of this thesis is research qualitative as it is deemed more appropriate to address the nuances of the phenomenon that is consumers experience with IT. Therefore, a prominent UXD qualitative based framework by McCarthy and Wright was selected and employed for this thesis research. The framework is called the four threads of experience and this is discussed in the next subsection.

2.7 THE FOUR THREADS OF EXPERIENCE (4TE)

In their seminal work, Technology as Experience, McCarthy and Wright (2004) highlight the possibility and the capability of technologies to be viewed or regarded as part of our everyday lives' experiences. People do not just use technologies, but live with them. They further argue that an experience is not only the responsible of humans but also objects and environments. Therefore, an experience is neither constructed subjectively nor objectively, rather, in an interactive process between a person and a technology. During an interaction with a technology, the device and the system that construct it are able to become an object of interaction that works collaboratively with a person's subjective knowledge and perception subsequently built an experience. Although people

may not be aware, this interactionist process appears to have a start and an end, from which the past and present 'pieces' would iteratively combined forming a larger experience. This experience is called as the felt-life, which accounts engagement, enchantment, irritation and most importantly fulfillment. Positive felt-life experience that are experienced at the moment of interaction between a person and a technology often transcends the start and stop of the activity and permeates the person's daily life.

In the last decades, the importance of an experience resulted from a technology and most importantly during interaction with a technology has been placed in the forefront by much researcher (Hassenzahl and Tractinsky 2006; Lykke and Jantzen 2016; Wright et al. 2018). McCarthy and Wright (2004) highlight that felt-life experience is in the very heart of an interaction with a technology. It is the moment when a person is in a higher state of perception, which may lead to a better quality of the resulted experience. Shneiderman (2002, p. 2) states that "successful technologies are those that are in harmony with users' needs. They must support relationships and activities that enrich the users' experiences". In short, a technology should be able to support activities and relationships that heighten their experiences. A technology thus should and could be devised accordingly by adopting the basic core of human's behaviour.

As a means to assist future studies in analysing experience with technology, McCarthy and Wright (2004) created the four threads of experience framework that consists: sensual, emotional, compositional and spatio-temporal. Rather than as a definition or categorisation of experience elements, this framework embodies ideas, with which a clearer thinking of technology as experience, is expected to be achieved. It is also acknowledged as one of the most influential framework in the scope of user experience design (UXD) field. UXD therefore, clearly concerns not only the usability or functional part of a technology, but also and chiefly on the experiential part of it (Law et al. 2009; O'brien 2010). The four

threads of experience are strongly rooted from pragmatist literature, namely Dewey's study Art as Experience (1934). This framework is discussed below.

Sensual Thread

The sensual thread refers to the immediate sensory perception on a technology and the environment in which it is presented. This type of experience typically derives from a perceptible real object and ambience, which are the physical manifestation of a technology and what surrounds it. Although they are bodily engaged with the experience, people are not always aware of this perception, as it is pre-reflective in the sense that it happens naturally and automatically. This should mean that sensual thread relies on other threads to make borders that would frame a particular experience from other experiences (Wright, Wallace and McCarthy 2008).

Human senses clearly play an important role in sensorial perception process. Visual (sight), auditory (sound) and tactile (touch) are arguably the most used sense when experiencing a technology. Gustatory (taste) may be considered as the least sensory perception to be found in a technology, although it might be possible to be discovered in future technology. In the case of olfactory (smell), in the recent years technologies are increasingly using systems that allow consumers to see, to touch and also to smell it. As an example, a food brand had promoted its new taste through a sensor based digital signage at a bus shelter, which could spray the scent of a jacket potato whenever people approached it (The Drum 2012). McCarthy and Wright (2004) point out to visual as the most important sensory perception, despite they also state that a holistic sensory perception is of equal importance. By using only, for example sound, or smell, people would perceive with limitation or indirectly. Their argumentation implies that one would not be able to fully experience a technology without a visual. This may be partly true. But it also does not provide an assurance of the quality of an

experience, let alone the meaning of it. Spence et al. (2014) similarly highlight the importance of multi-sensory perception in order to attain a rich experience. They did not mention of the superiority of visual but rather emphasise on the maximum or complete use of human sensory perception all together. As a consequence of perceptions, feelings would be present. Sensual thread underlines these feelings, which shows its strong relationship with the next thread that will be discussed.

Emotional Thread

The second thread, emotional, refers to the judgments of value from a technology that is associated to a person's needs and desires. Emotions are often directed towards people, objects or other aspects, namely situation and condition. This thread follows and interacts closely with the sensual thread. Emotions may present immediately after a short perception and it colours an experience (Wright, Wallace and McCarthy 2008). The dynamic of emotions would change throughout an interaction with a technology; thus it is highly dependent to the sensory perceptions and working together iteratively. When the interaction ends, it will finally reveal a 'final' emotion that might be crucial for the process of memorising an experience. For instance, a feeling of playfulness as a consequence of an interaction with an augmented reality changing room in a fashion store might leave a distinctive and positive experience should it went smoothly from start to finish (Huang and Liu 2014). The playfulness however, could be override by another emotion, for example frustration, if during interaction the person found it hard to use or it was not working properly. Emotional thread however, should not be viewed as a result of an experience, but rather as the summary of it. It is a collection of emotions that happens in a particular moment with marked time and fuses into a one memorable emotion. Additionally, this thread embraces other threads and reveals aspects of feelings, which are instrumental for an experience to be remembered.

Compositional Thread

The third thread is compositional. In concerns the narrative of experience composition, the sense making process on the association of elements and the entire experience. In other words, it is the process of structuring a coherent story for the experience. This structure also normally has a clear mark for the beginning and the end. McCarthy and Wright (2004) used a painting as an example to explain this thread; starting from the moment when a person sees it, all presented colours, brush strokes texture, layout, the embedded story, the frame, understanding process, then when finally the person leaves the painting with an emotion, a memory and an experience. To apply this on interactive technology, compositional thread seems to begin when a person sees it. Followed by an approach towards the technology, seeing the digital screen, recognising its graphical interface, which presents colours, text, images, possibly video, layout. Then the person starts to 'tap' the screen, following instructions accordingly, understanding process, until finally the interaction ends and the person leaves.

The compositional thread appears to have a strong interplay with the sensual thread, which happens throughout the perception of the narrative process, and the emotional thread, which happens instantly when the person sees it. Sensual is strongly required to perceive and help understanding the narrative process. A person needs to visually see the physical look of an interactive technology, including its graphical interface. During this visual perception, it is possible that the emotional thread already plays a role, which can be either positive or negative. This emotion of course would be fluid. Other sensory perceptions may be used during interaction, such as touching the texture of the screen when tapping the graphical buttons on the screen. Also when hearing the sounds of each 'taps' or possibly a song or a special effect sound. Throughout the interaction, the interplay between the sensual and the emotional threads follows along the linear steps.

It is interesting to rethink and discuss how McCarthy and Wright (2004) explain aesthetic experience as the core of the compositional thread. Looking with this lens, it allows people to 'frame' their experience. Extracting from Dewey's (1934) work on aesthetic experiences, they use it to differentiate a particular experience from the 'always on' common experience. Furthermore, a person would be immersed in their experience and somewhat fuses with the object of the experience. Although it may not be clear sometimes, a person would somehow be able to know the beginning and the end of it. One person may be fully aware when interacting with an interactive technology; they know when it starts and ends. In another case, it would be possible for another person to be not fully aware of when is the beginning and end of the interaction. The latter often happens when the interactive technology does not intrigue the person enough to 'frame' and place awareness on it.

Spatio-temporal thread

This thread refers to a space and time that house an experience. The spatio-temporal thread signposts people to the specificity of an experience as it is strongly bounded to contexts. As McCarthy and Wright put it, "they relate to a particular person in a particular situation at a particular time" (McCarthy and Wright 2004, p. 88). A space experienced today would be different when experienced tomorrow. But apparently, McCarthy and Wright (2004) seem to use the terms; space and place interchangeably, which implies both term possess the same meaning. It may possibly be clearer to view a space and a place as two different entities. While a space typically point out to a 3 dimensional physical object in which one is presented, place is typically associated more to an abstract concept or the value of something, and as might be expected, both have similar importance in shaping experiences (Akpan et al. 2013). Take a shopping mall as an example. What constitutes the concept of a shopping mall's space is generally the building itself. The roof, walls, floors, glass doors, and other physical things

than can clearly be perceived. Sometimes, a parking lot that belongs to the related shopping mall could even be regarded as the area of a shopping mall. Consensus of a shopping mall's space could normally be achieved. But this is not the case for the concept of place. People may have the same perception of space towards a shopping mall but they typically have different ideas of the meaning. One person may regard a shopping mall as a place to relax, to be entertained and to be socially connected. Another person might view a shopping mall as a place to work, where he or she could find a café to sit in and write and be inspired. A place has more possibility to differ for people. This illustration displays that a space and a place are strongly linked nevertheless could be separated into different concepts (Harrison and Dourish 1996).

Other than that, spatio-temporal brings the difference between a personal and a public space, both of which also shape the interaction experience. A person may feel the same comfort when using mobile phone in his or her bedroom home and when using it, for instance, in a public transportation. The mobile phone is a familiar personal device that could make someone engrossed with it, however it can be argued that different space and time should somewhat affect the usage and more importantly the interaction experience (Marshall et al. 2011). This would go further to an interaction with a technology provided in a fashion store, which belongs to public. Obviously, the space of a physical fashion store, with what populates it, along with the time, would influence how a person interacts with a technology.

2.8 GAP IDENTIFICATION & RESEARCH QUESTIONS

2.8.1 Research gap

From the literature review it can be concluded that of the many channels that can be used to convey experiences, there are two channels that are the most important for consumer experience: digital and physical. The interactivity of the digital channel affords consumers to be active and in control; they would be able to select the information they want to consume (McCormick and Livett 2012; Koo et al. 2016). Other than that, the digital channel along with the Internet can give consumers access to vast information efficiently (Verhoef, Kannan and Inman 2015). These are the main reasons for the tendency of consumers towards digital interaction experience.

Of equal importance, the physical (channel) store elements can help produce positive outcomes for store visitor experience (Kotler 1974; Clarke, Perry and Denson 2012; Ballantine et al 2015). One of the most important positive effects from a physical channel (store) is a multi sensory experience for store visitors (Spence et al. 2014; Alexander and Nobbs 2016). Further, this experience can be strengthened by having interactive technology as part of the elements; the presence of technology conveys a modern ambience for the store while its content can provide digital interaction for a user (Dennis et al. 2014; Kent et al. 2015; Bonetti and Perry 2017).

The two channels, with their unique characteristics, can provide experiences for consumers. It can be contended that the integration of both channels can increase the quality of the consumer experience. Findings from market research and academic studies indicate that physical store visits are still high despite the preferable digital channel (Mintel 2015; 2017; Alexander and Nobbs 2016).

Many fashion brands have started integrating interactive technology to provide 'in-store' digital experience for consumers (Alexander Alvarado 2017; Bonetti and Perry 2017). Interactive technology in physical fashion stores are expected to function not only to gratify consumers' demand for digital interaction, but also as a way to communicate interactively and build relationship with them (Kent et al 2015; Armstrong and Rutter 2017). Consumers who are using interactive technology can experience digital content on interactive technology while at the same being immersed with the physical store elements (Kent et al. 2015; Alexander and Alvarado 2017). It can be argued therefore that the integration of interactive technology in physical stores opens many opportunities to increase consumer experience. A number of studies have concluded how interactive technology is able to complement consumers' store experience and subsequently heightened the overall experience (Dennis et al. 2014; Kent et al. 2015; Alexander and Alvarado; 2017). These studies however focused on the effects of the interactive technology on consumers or the values created for consumers. How the experience can be heightened lies in the process of perception-action, the interaction experience, when using interactive technology (McCarthy and Wright 2004; Wright et al. 2018). The process of experiencing defines the perception state of the technology; and how the user act and react towards the technology (Jantzen 2013; Wright and McCarthy 2010). All this shapes the frameable experience, and therefore increases the experiential process and values (Mathwick et al. 2010; Wright et al. 2018).

Interaction experience is therefore key. This highlights the importance of further research in this field. Deeper understanding of interaction experience with interactive technology can fuel insights into designing and improving the integration of interactive technology in fashion stores for distinctive experiences. This has also been suggested by previous studies (for example, Kent et al. 2015; Alexander and Alvarado 2017). Exploring experience with interactive technology in fashion stores, which was the aim of this research, therefore should be directed

more towards the perception-action process and the creation of the interaction experience, when using interactive technology.

Despite the importance of understanding interaction experience, there are very few studies that have had investigated the interaction experience of interactive technology in fashion stores. Most of the studies covered the implementation of the interactive technology in fashion stores (eg, Kent et al. 2015; Bonetti and Perry 2017), the antecedents of the usage (eg, Huang and Liu 2014) or the effect of the technology (eg, Dennis et al. 2014); but not the process of the interaction. This points to a gap in the literature and the necessity to explore the topic further.

2.8.2 Research questions

The importance of exploring elements of interaction experience towards stimuli, has been put forward by many researchers (for example, McCarthy and Wright 2004, Hassenzahl 2010; Sohn 2011; Wright et al. 2018). An exploration into those elements could contribute to an understanding of the totality of the process of the interaction experience; These consist of a human, the object and the interaction process connecting the first to the other aspects. Focusing exclusively on the object (cues) or a human's internal state would not be sufficient. Experience is a stream of consciousness, perceiving in high awareness the object in question while also fuelling the perception with prior knowledge (Jantzen 2013).

Increasingly the relationship between people and technology has become closer. This points to the necessity to understand the interactions with interactive technology concerning holistic sides, efficient side and experiential side. UXD approach has been regarded as the appropriate approach to understand interaction experience with technology (Hassenzahl and Tractinsky 2006; Wright et al. 2018). There are studies that have investigated interaction experience with

UXD approach, and further describing the experience elements (for example, Wright and McCarthy 2010; Hassenzahl et al. 2015). However the ones that focus on interactive technology in fashion stores are very limited. When there are studies on interactive technology in fashion stores, mostly are not using a UXD approach and/or not exploring the interaction experience (for example, Dennis et al. 2014; Kent et al. 2015; Alexander and Alvarado 2017). As such, it is paramount to explore the interaction experience of interactive technology in fashion stores. This rationale leads to the generation of research question one (RQ1):

RQ1   What is the interaction experience that consumers elicited from interactive technology in fashion stores?

Many UXD studies employ qualitative approach research (for example, Wright and McCarthy 2010; Anderson et al. 2016; Gaudi et al. 2018), because when using a quantitative approach, although variables can be measured, deeper insights are difficult to be found (Blandford et al. 2016). In order to achieve rigorous qualitative research findings however, multiple data collection methods are required; the combination of methods can help increase the validity and reliability (Akpan et al. 2013; Ladner 2014; Lykke and Jantzen 2016; Blandford et al. 2016). One way to implement this multiple data collection is to combine 'what has been expressed/said' with 'what has been done', meaning combining interviews or other formats of participants' opinion with observations (Akpan et al 2013; Blandford 2016). Through action observations, the actual interaction can be seen and expressions can be confirmed or enhanced; as a result a better understanding can be attained.

An earlier study by Marshall et al (2011b) about how people approach a tabletop in a tourism information space used observation (rapid ethnography) and interviews, through which they found insightful results that are rigorous and

practical. It is important therefore to set a question that can complement RQ1, to understand consumers' actions during interactions with interactive technology in fashion in-stores. Thus research question two (RQ2) was constructed:

RQ2   How do consumers interact with interactive technology in fashion stores?

Previous research suggests that interactive technology in fashion stores can elevate consumers' experience (for example, Poncin and Ben Mimoun 2014; Huang and Liu 2014; Kent et al. 2015). This is partly because consumers can experience the stores' full sensory experience directly and at the same time they can also experience the digital experience from the installed technology, especially those interactive. However, details of how the experience with interactive technology can complement the overall store experience have not been fully covered. The answer to this question can provide contributions for practice, that is how best to integrate the technology in a physical fashion store. This constructs research questions three (RQ3):

RQ3   In what way does interactive technology heighten consumers' experience?

2.9 CHAPTER SUMMARY

Experience is an iterative process of perceiving (erlebnis) for and through knowledge (erfahrung) (Jantzen 2013). Therefore experience cannot be reduced into only one understanding as it is complex and a continuous process (Forlizzi and Battarbee 2004; McCarthy and Wright 2004; Wright and McCarthy 2010; Wright et al.2018). Many UXD studies, which focuses on the relationships/interactions between human-technology however points out the importance of focusing more on the perception process as it is what defines the produced knowledge, such as values, emotions, memories (McCarthy and Wright 2004; Hassenzahl and Tractinsky 2006; Jensen 2013; Wright et al. 2018). More importantly making the perception process the centre of attention can help obtain deeper understanding of interaction experience with technology (Lallemand et al. 2015). This means that insights can be obtain to better improve design for interactive technology that can shape the interactions for distinctive experience. This is aligned with the topic of the research, thus exploring experience with interactive technology in fashion stores therefore should focus more on the perception process of interaction experience.

User experience design (UXD) approach is deemed suitable to help explicate the topic. The approach views interaction experience more holistically, covering both the efficient (goal oriented tasks) and the pleasurable/enjoyable sides of interaction experience with technology (Roto et al. 2011; Hassenzahl et al. 2015). UXD approach focuses more on the perception-action (interaction experience) with technology, but it also accounts for aspects surrounding the interactions (Pucillo and Cascini 2014; Lallemand et al. 2015). In relation to this, the four threads of experience by McCarthy and Wright (2004) was chosen as the main UXD theoretical framework for this research. The core assumption of the framework is that interaction experience cannot be reduced into variables, and interaction experience is formed by threads that are jointly working together; the

threads are sensual, compositional, emotional and spatio-temporal (McCarthy and Wright 2004).

Research gaps have been identified through the literature review. Those gaps render questions that will help to achieve the purpose of the research and fulfil one of the research objectives. The research questions that were formulated are as follows:

RQ1   What is the interaction experience that consumers elicited from interactive technology in fashion stores?

RQ2   How do consumers interact with interactive technology in fashion stores?

RQ3   In what way does interactive technology heighten consumers' experience?

The next chapter is research methodology in which the plan and implementation of research design, methods and analysis are presented.

CHAPTER THREE:
METHODOLOGY

3.1 INTRODUCTION

Chapter three aims to operationalise the details of the research design and explain the methodology in the current study, as well as substantiate the methods for the primary research. The methodology has two primary functions. First, to function as a plan or blueprint for the research. Second, it should enable the researcher to consistently conduct the research as a process. The purpose of this chapter is to discuss the research philosophy in relation to other philosophies; to expound the research strategy, including the research methods adopted and utilised in the pursuit of the research aim. The way in which the research is conducted may be conceived of in terms of the subscribed research philosophy, the research strategy employed, the research methods utilised in the pursuit of a goal - the research objectives - and the quest for the solution of a problem - the research questions (see figure 2). It will also ensure the validity and reliability of the findings.
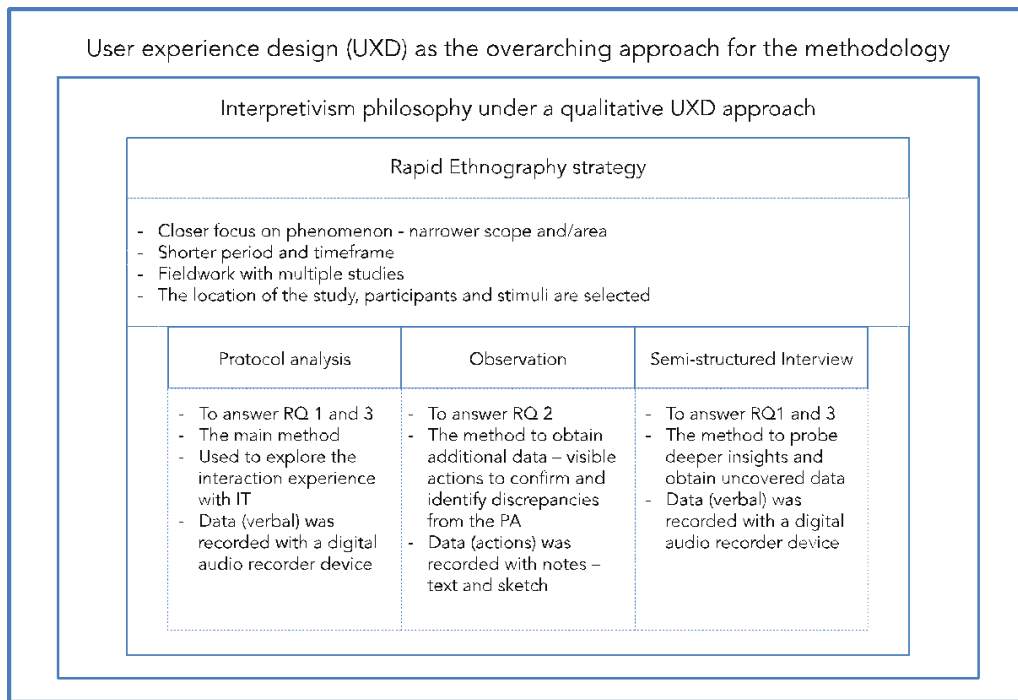
Figure 2. Methodology conceptual framework

3.2 RESEARCH PHILOSOPHY

This thesis explores consumers' experience with interactive technologies in fashion stores. As reviewed in the research literature, consumers are becoming increasingly digitally confident, embedding technologies within their everyday lives and activities. The implementation of interactive technologies in physical stores by fashion brands is partly to address this. As such, fashion brands have started providing those technologies as part of their in-store service, and consumers have started using them as part of their in-store experience. This "contact point" activity between consumers and interactive technologies is the phenomenon, the focus of the research. Nonetheless, it is fair to say that the use of instore technologies is still at an early stage. Studies have shown that there is an increase in interactive in-store technology, at least some of which can be considered as innovative (Akpan et al. 2013; Pantano 2016), but it appears that only a few retailers use it. From the consumers side there are stronger reasons

for store visits that the opportunity to interact with those technologies (Davis and Hodges 2012).

It was demonstrated in the previous chapter that research regarding consumers experience with IT is limited. Therefore, it not only shows a gap in knowledge, but also underlines how the phenomenon is something that requires further exploration. In addition, to explore is to discover: to understand more about something. And using one significant point from the literature review regarding experience, the process of understanding is a combination of perceiving and using previous knowledge. The key to this is interpretation. This research takes the position that experience is something that is difficult to measure and reduce into individual elements (Dewey 1934; 2005; Wright and McCarthy 2010; Jantzen 2013). A reductive point of view, which is attached to positivism, is unable to capture the nuances of experience, predominantly because experience itself is a perpetual process, constructed through perception, meaning making and action. This process results in knowledge and actions that are unmeasurable. Moreover, people in general have different backgrounds and knowledge, which influence how they act in a situation. Thus the experience is relative. Interaction experience with interactive technology is the foci of this research. Different background and context generated experiences that are distinctive and transient. One way to understand this is through an interpretive process by which the subtleties of the experience can be understood and described with narrative. It can be argued therefore that interpretations are at the heart of this research and that an interpretivist philosophy is the appropriate worldview to explore the phenomenon.

A research philosophy is a comprehensive system of belief that position oneself in viewing the world, which in turn guides the research (Willis 2007). It concerns the researcher's worldview and application to practice (O'Donoghue 2006). The core idea of interpretivism is to work with subjective meanings that are presented in the social world by acknowledging, reconstructing and also to understand

these meanings without misinterpreting them (Silverman 2000; Goldkuhl 2012). The philosophy rejects positivism, which believes that explanatory methodologies derived from natural science can be used to understand the behaviour of humans (Willis 2007, p. 6). As such theories and concepts are used mostly to guide the research process which is exploratory in nature (Morehouse 2012).

Specifically, interpretivism emerged as a response to the rationality of scientific research in social sciences (Gregor 2002). It was derived from Immanuel Kant's philosophy, which holds that it is impossible to conduct research objectively, as views and subjective opinions cannot be entirely separated (Tejera and Lavine 2012). Further, interpretivism embodies Greek and Roman philosophical threads. The first thread is rationalism, which holds the idea that empiricism is not only the way to know and understand something. The second thread is relativism, which holds the idea that experiences and culture greatly influence the way one perceives reality. These two threads fuse into a philosophy that carries human meaning-making as its central point (Willis 2007).

In interpretivism, theories and concepts may serve as a guide to understand the phenomenon, nevertheless an open perspective towards new understanding is the most important. The philosophy views a phenomenon as something that is constructed through experiences, culture and language bounded with meanings, all of which are complex and rich and therefore can only be understood through interpretations (O'Donoghue 2006). The base assumption of interpretivism derives from the notion that essentially every individual, although influenced by the society in which they are present, has their own perception about reality (Creswell 2012). Through this subjective perception and external influence, multiple meanings construct experiences through behaviour and day- to-day activities (Schwartz-Shea and Yanow 2012). The focus of interpretivism is therefore towards narratives, stories, perceptions and meanings through the

interpretation of the researcher (Schwartz-Shea and Yanow 2012; Goldkuhl, 2012).

Meaning-making may be considered as an individual process. Nonetheless, it is also bounded by people, in this case the society in which one is immersed. This is one reason why an interpretive approach is well-established in sociology. Max Weber, a pioneer in interpretive sociology believed that people have their own feelings, thinking and way of behaving, all of which are fused into patterns that can be understood by them and can be called as social actions (Weber 1978). This is where interpretivism plays an important role in the meaning- making process, because fundamentally, people tend to behave according to their wants and needs for gratification. Nevertheless, they are concurrently influenced by how others react and can change their subsequent actions accordingly. All this is closely knitted together to form meanings that contribute to culture. One's interpretation authorises one's behaviour. An attempt to "capture" the richness and subtleties of how humans interpret things and act accordingly can be undertaken through the interpretive process. Interpretivists aim to uncover and understand how the people within the context of the study view the phenomenon and the meanings for them (Willis 2007). As also noted in the field of sociology, interpretivism is the way to identify the different and the shared patterns within the interweaving interactions, and then present these understandings into comprehensible themes (Burger 1977). These new understandings and worldview subsequently can be used to further build theories or conclusions to studies (Schwartz-Shea and Yanow 2012; Saunders 2016).

Interpretivism is often used in qualitative research, which typically generates text-based data (Glesne and Peshkin 1992). A qualitative approach enables the researcher/interpretivist to obtain rich data text for a better understanding of the phenomenon under study (Willis 2007, p. 90). Rather than seeking exact information, the researcher/interpretivist seeks how people intersubjectively

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perceive a phenomenon and explores those meanings (McQueen 2002). It is more difficult to elicit in-depth information and insights through number-based data statistical analysis employed in a quantitative research (Creswell 2009). The data obtained and presented therefore will be narrative (Silverman 2000).

In summary, this research embraces interpretivism to explore consumers' experience with IT in fashion stores. The researcher will use a meaning-making process to understand the interactions between the participants and the IT, which itself is also established through meaning-making. By interpreting the interaction experience, the nuances of the consumers'/participants' thinking, feeling and behaviour towards IT in fashion stores can be elicited. The research is conducted in situ, meaning the participants of the research experience the IT inside fashion stores, not an experimental, making it as close as possible to the real activities in physical fashion stores. That is, it is a process that cannot be fully captured from a positivist standpoint, which uses measures and quantification.

3.3 RESEARCH STRATEGY

3.3.1 Ethnography

In essence, ethnography stems from cultural anthropology, a study that focuses on human culture within small-scale societies (LeCompte 1999). This core is the foundation of ethnographic studies, which are the origins, composition and preservation of culture (Goulding 2005). Ethnography aims to look at what people in small societies communicate, exploring the shared meanings system known as "culture" (Goulding 2005). This reflects that it is emic driven but still coupled with etic. As suggested by Arnould (1998, p. 86), "ethnography attempts to explicate structured patterns of action that are cultural and/or social rather than merely cognitive, behavioural or affective". A large number of

academic articles concerning ethnography state that in order to obtain rich data representing the lived experiences of the people under investigation in their social settings, a long period of continuous fieldwork is required; ethnography may take a minimum of twelve months (Seale et al. 2004; Hammersley 2006; Van Maanen 2011; Jeffery and Troman 2013; Silverman 2013; Olson and Kellogg 2014).

Ethnography has been widely used for consumer research in marketing, including the patterns and meanings of consumption (Ladner 2016; Belk 2017). It is noted that the possession of material things project social meanings and thus can be regarded as cultural communicators (Pettigrew 2000; Fortezza et al. 2018). Consumption has been discussed in the literature review and in the light of the term 'experience economy', consumption has gone beyond the possession of materiality, to include intangible things, namely services and experiences (Pine and Gilmore 1999; Atwal and Williams 2017).

In terms of data collection procedures, ethnography relies on multiple types of data collection which are distinctive, and as such the combination can be cross sectional and flexible (Boyle 1994; Caru and Cova 2008). Nonetheless, the key feature is still the intensive and direct contact with participants over a long period in their natural settings in which the native's point of view can be elicited and presented in the final writing of a research (Boyle 1994; Muecke 1994; Goulding 2005). The long period of time to collect data in ethnography aims to achieve a deeper understanding of the culture of the people under study and to avoid missing the insights that can be drawn from developing patterns (Delamont 2012).

A characteristic of an ethnographic approach is that the researcher is simultaneously part of the world that is under study (Boyle 1994). The insider (native/participants) and outsider (researcher) views will then be combined to provide a deeper and richer insight of the study. This third view of the

ethnographic picture can be developed as a theme from these two-sided views which then provides a theoretical explanation of the studied phenomenon (Goulding 2005; Caru and Cova 2008).

Within the HCI and interaction design fields, ethnography is often employed as a strategy to understand how people interact with technologies in their everyday lives (Wright and McCarthy 2010). According to Millen (2000), ethnography enables researchers to obtain a richer understanding of in-situ settings and use context for a particular technology. Furthermore, apart from extracting information about user requirements, it also helps to understand the complexities between individuals who are using the technology in question (Rogers et al. 2015).

In order to obtain these insights, ethnography naturally requires long period of time to collect data (Delamont 2012, p. 206). Most researchers tend to combine methods such as user testing observation, protocol analysis and interviews, among others (Akpan et al. 2013). Nevertheless, they can be faced with demands from stakeholders, for instance the client, to obtain data more quickly without losing the quality of ethnography. One reason for this is because both the industry and people's behaviour evolve quickly. The product development of technologies is advancing rapidly as a means to accommodate consumer demand and as they are becoming more attached to and in need of, those technologies to aid their activities (Rogers et al. 2015). As a means to overcome such issues, the idea of a quicker type of ethnography with a more intense and shorter data collection was proposed, that is rapid ethnography (RA) (Millen 2000). This will be discussed further in the next subsection.

3.3.2 Rapid Ethnography

Ethnography started being used as a research strategy for other disciplines including studies about the relationship between humans and computer, namely human computer interaction (HCI), interaction design (ID) and user experience design (UXD). Ethnography rose to prominence in the field of human computer interaction in the 1980s. Both scholars and practitioners have used ethnography to attain a deeper understanding of the interaction between humans and computers in quotidian activities (Rogers et al. 2011; Olson and Kellogg 2014). Given a number of factors, particularly the necessity to produce findings in a more limited time, a traditional ethnographical approach can be infeasible. Many studies have started adopting ethnography for a shorter study; conducting fieldwork in a short time and oscillation type studies (Pink 2013; Akpan et al. 2013). It was not until the year 2000 when Millen, a computer research scientist at AT&T with a cognitive science and psychology background, finally introduced rapid ethnography to the field.

Millen (2000) proposed rapid ethnography (RE) with the aim of applying ethnography in a considerably shorter period of time without diminishing the quality of the data. Being a researcher in the industry, Millen underlined the necessity to obtain insights efficiently, thus the findings can inform the design (user experience and interactions) efficiently too. In essence, rapid ethnography is a collection of field methods to provide (user experience) designers with a reasonable qualitative understanding of users and their activities given a limited amount of time spent in the field gathering data (Millen 2000). In the field of UXD, 'reasonable understanding' of users refers more to a condition where the researcher has acquired sufficient data to inform the design process with new insights (Marshall, Rogers and Pantidi 2011). It is considered sufficient to inform a design process because RE covers participants' thinking, feelings and behaviour intensely (Pink and Morgan 2013).

Rapid ethnography as a research strategy has been disseminated at many industry and academic conferences. It has since been accepted and used by many researchers in both areas, not only in the field of user experience design but also social science in general (for example, Akpan et al. 2013; Pink and Morgan 2013). Particularly in the field of UXD, obtaining data efficiently is highly required. UX designers cannot afford to conduct ethnographic research that requires long period of time (Rogers et al. 2013). Design process for user experience needs to be progressive and efficient. Rather than conducting long research with more findings, UX designers prefer to do an iterative process of data collection-design; obtain actionable insights efficiently for quick prototyping before collecting data again until at some point the data can sufficiently inform the final design (Preece et al. 2015; Wright et al. 2018). Through RE, researchers can lessen time demands taking short focused studies to rapidly gain understanding of the work setting, while referring back to previous studies in that field to help provide a greater design context for systems or devices under development (Preece et al. 2015). As such, shorter time and multiple studies are at the core of RE. It can thus be argued that RE is a strategy that is strongly attached to UXD methodology.

This research centralises its exploration in the phenomenon of how people interact with interactive technologies. It involves an interaction between humans and objects, but it is essentially concerning more on the humans. Technologies as an object are akin to other types of objects that surround them. Objects that have been used as a tool for daily activities, that are part of physical built of their surroundings. These are influencing humans iteratively. Nonetheless, humans are the ones who make the meanings and act accordingly. This means humans have the capability to adjust those objects according to their needs and values, which shows the importance of understanding these needs and values.

The interaction of humans and technologies in this thesis is magnified in the context of shopping activities in physical fashion stores. These stores are public

spaces. Given that shopping is a common daily activity, it can be argued that shopping in fashion stores is part of human culture (Shaw 2010). The stores can therefore be regarded as a natural setting (Akpan et al. 2013).

Going by the nature of the phenomenon, several aspects should be underlined for deciding the best strategy to address this research. The first is undoubtedly to centre the focus on human – feeling, thinking and behaviour. The second is it has to able to gather data in the field in a relatively shorter time, in this case less than one year, but still rich and thick. The third is it has to be able to conduct the research individually but with a high-level efficacy or power. Last but not least is to have a strategy that can be used to frame the interaction between people and technologies in situ. All this requires strategy that is centred in human, flexible, shorter in time but heavy in methods, and practical. It can be concluded that rapid ethnography (RE) is appropriate to be used as the strategy for this thesis.

As mentioned earlier, the shorter period of data collection is complemented with multiple and intense methods under which rich and thick data still can be obtained. Through RE, researchers can lessen time demands taking short focused studies to rapidly gain understanding of the work setting, while referring back to previous studies in that field to help provide a greater design context for systems under development. RE apparently is not the first to propose a type of assessment that can be applied rapidly. In the 1980's and 1990'2 a form of rapid assessment had already been introduced in the health research area, which are designed to tightly target a given sample of people, and intensify that sample with a variety of qualitative techniques (Scrimshaw et al. 1991; S. Scrimshaw and Hurtado, 1987)

Humans' interactions with technologies can also be regarded as part of human culture. RE understandably has been used in both HCI and UXD research as one method for observing humans' interactions with technologies in their everyday activities (Wright and McCarthy 2010; Ladner 2012). Furthermore, apart from acquiring information about user requirements it also helps to

understand the complexities between individuals who are using the technology in question (Rogers et al. 2015). RE places a human face on data through real-life stories that the researcher can relate to and remember and captures behaviour in the different contexts of everyday life in an efficient manner (Rogers et al. 2015).

Given that the data obtained from ethnographic research is to be used for practical implications, such as business or marketing, ethnographers are faced with demands from stakeholders, for instance the client, to obtain data more quickly without losing the quality of ethnography. As a means to overcome such issues, the idea of a quicker type of ethnography with shorter data collection process but more intense can be acceptable (Millen 2000).

According to Millen (2000) there are three primary traits of RA, which are its focus on key informants, interactive observations and collaborative data analysis.

Focus and Key Informants: "Motivated Looking"
Researchers should narrow the focus of the field and to research appropriately before entering the field, because wide-angle focus tends to take up a lot of time and invested energy in observing and capturing data that could possibly not very useful for the research. This is also regarded as trimming the potential data (Handwerker 2001). By focus, the researcher should identify the general area of interest along with specific questions to be answered by the fieldwork that, as a result will better help cover the field and how one can frame the field data analysis. In addition, the researcher should zoom in on the important activities and to use key relevant informants. One of the major goals in RA is to observe and understand interesting patterns or exceptional behaviour within a tight area and then to make practical use of that understanding. This implies, for this research, the researcher should undertake a pre-observation of fashion stores and decide those that are representable and feasible. The interactive technology should also be reviewed in that pre-observation. All this will help the researcher

to be more familiar with the detailed store environment; its layout, ambience, crowding, and other atmospherics and the IT consisting of types of IT, interfaces, and other characteristics. Regarding the participants, the researcher should identify the most relevant people that can provide direct and rich information. They have to be very specifically selected according to the project's requirements through an interview process. At this stage, the participants can even suggest something in relation to the area and location of the study. Both for the stores and participant selection, a purposive sampling technique is applied. Another key application in RA is to triangulate by asking the same question in many different ways with a very specific sample using a combination of methods, such as observation and interview, with repetition, and by carefully assessing the recruitment criteria (Ladner 2012).

Interactive Observations

The researcher should use multiple interactive techniques to increase the likelihood of discovering exceptional and useful use of behaviour. It has been suggested to have more than one researcher in the field at the same time because multiple researchers can split the observation work, undertake more in depth interpretive research and can provide multiple views that can provide richer understanding of situations within the research. Another way however is to use methods that can be implemented at the same time (Pink and Morgan 2013). This should be coupled with maximizing time spent in the field by judicious findings and selection of activity peaks.

Collaborative Data Analysis

Using collaborative, flexible and computerised analytical methods can help achieve more efficient results. Computer assisted analysis allows exploration of the large amounts of qualitative data analysis in a shorter time. For instance, using a computer with qualitative software such as NVIVO can aid in identifying larger patterns and categorising them. The use of software tools as text or for multimedia will improve the time that is necessary for the researcher to

understand the field data. Another approach that can make the process more efficient is the selection of appropriate analytical processes. Some examples of analytical processes are: cognitive mapping, pictorial storytelling and scenario analysis.

As such RE can be very practical for research in the field and collectively provides a richer field experience for smaller amount of time. RE can be employed not only for understanding the time taken over an activity by the user, but also the users' interaction techniques, such as what they are doing, what outside factors are in place, and what is their understanding on the situation during interactions.

One study that has employed RE is Akpan et al.'s (2013) in which they explore people's interaction with a large outdoor interactive display in public spaces. Multiple methods were used, namely observation, interview and position mapping in the form of sketches. The non-intrusive observation and position mapping were done concurrently to examine how people see, approach and interact with the display. The interviews were undertaken to obtain additional information from selected users. This can be those who are actually interacting longer than others, group of people and also those who are not interested in approaching the display. The research reports that RE was effective and efficient to help better understand how people interact with a public display.

3.3.3 Rationale for choice of strategy

Rapid ethnography was suitable as the strategy for this research for two main reasons. First, the shorter period of the primary research would allow the researcher to constantly manage the focus on the phenomenon. As some social science researchers have explained, ethnography is prone to bias due to the length of the process that may take at least one continuous year (Seale et al.

2004; Hammersley 2006; Silverman 2013). Second, this strategy affords multiple studies in different locations, situation and context through which more data can be generated and analysed. Data from various studies can be aligned and contrasted for a better evaluation and thus can help attain richer insights (Millen 2000; Pink and Morgan 2013; Akpan et al. 2013). Moreover, given the considerably recent appearance of in-store technology used in fashion stores (Mintel 2017), rapid ethnography is an agile strategy that is appropriate for this research.

3.4 DATA COLLECTION METHODS

To address RQ1 and RQ3, a protocol analysis followed by a semi-structured interview was applied. In addition, personal note taking/observation was undertaken. This combination produced subjective introspective text data from the former, along with additional text data from the latter. This technique is relevant and suitable to obtain data associated to consumers' experience (Li, Daugherty and Biocca 2011). To answer RQ2, in situ observation was carried out, along with semi-structured interviews where appropriate. Details of each method are elaborated in the following section.

3.4.1 Protocol analysis

One data collection technique that has been acknowledged as suitable to explore consumer experience is protocol analysis (Wright 1980; Gould 1999). Protocol analysis (PA) is also known as cognitive response, think aloud, and thought verbalization (Wright 1980) and is a way of eliciting insight through participants' verbal reports during interaction with a stimulus (Ericsson and Simon 1984). In other words, it is the participants' direct and immediate report of stimuli.

What is important about this report is that each participant "thinks loudly", verbalizing everything that came across their mind towards stimuli.

Protocol analysis was first known as a research method in psychology (Crutcher 1994; Ericsson and Simon 1993). Initially it was used to encourage more introspective subjective thinking-feeling from the participants without restrictions as a form of unstructured interview. Given its introspective approach protocol analysis can help explore consumer behaviour deeper (Gould 1999; Jiang and Yen 2009) and has also been used in studies involving human-technology interactions (Van Waes 2000).

The captured data is therefore an immediate response that comes from an observation of a participant without being questioned. In this way the data will be "purer" as it stems from a participant's response, and without questions from the interviewer that may influence or lead a response. It is believed, without framing expected answers, it will produce unexpected data.

In user centred technology related research, namely UXD, a participant of PA typically will be instructed to verbalise what he or she thinks and feels about a technological device. Generally, a participant will just be informed briefly about the objectives of the PA with limited direction. UXD studies have reported the usefulness of this method and some examples are the investigation of commercial websites (Benbunan-Fich 2001), exploration of virtual experience on e-commerce (Li, Daugherty and Biocca 2001) and home networks (Jin, Pfister and Yi 2016). Furthermore, studies suggest that the data will predominantly be about the visuals and content of the technology in question, its navigation, and problems encountered during interaction (Benbunan-Fich 2001; Rogers et al. 2013). As a result, data can be used to understand more about a human's natural requirements of technologies. User experience designers can then improve the visuals and system.

Given the nature of the implementation of PA, which requires less involvement from a researcher, this method was decided as suitable for this research. The research strategy including rapid ethnography involves multiple methods to be employed concurrently. Thus, the researcher can employ PA while applying other method(s). During PA, the researcher can focus on observing the whole process, particularly when a participant is interacting with IT in fashion stores.

3.4.2 Observation

According to Marshall and Rossman (1989, p.79) observation can be defined as "the systematic description of events, behaviours, and artefacts in the social setting chosen for study". Observation is first introduced and often found in the field of anthropology, and it is regarded as the appropriate method for understanding humans (Bell 1955; DeMunck and Sobo 1998) and also in sociology (Kawulich 2005). It can be defined as a process of examining the actions and behaviour of people and their interplay with artefacts in a social setting (Marshall and Rossman 1989). This method enables a researcher to perceive directly the behaviour and actions of the people under study in situ without having to be involved very close. As suggested by Schensul, Schensul and LeCompte (1999, p.91) observation is "the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the researcher setting".

Observation has been reported to be effective for understanding how humans live their activities, as can be seen directly from their behaviour. Prominent psychologists, namely Skinner (1938) and Mehrabian (1971) have argued that what people do have more significance in reflecting what they really are. Often attitude and action are inconsistent (Mehrabian 1971). Moreover, humans' actions in a society are what matters as they are both they cause and result of

constant interplay between individuals and the people within their society (Skinner 1938; Blumer 1969).

During the observation process, a researcher needs to capture the situations under study using the five senses and describe them in a form, also known as "written photography" (Erlandson, Harris, Skipper and Allen 1993). During the activity, observation includes "active looking, improving memory, informal interviewing, writing detailed field notes, and perhaps most importantly, patience" (DeWalt & DeWalt 2002). Consequently observation, as a method, will make an important contribution to this research, based on the aim to explore consumers' interaction with IT in fashion stores. While the focus of the research is on the consumers' interaction with an IT, the way they act as they enter and while exploring the store is of equal importance. How they wander, search and find and approach the IT are all important in order to understand consumers' store behaviour, and how closely it is linked to the use and application of IT (Ballantine et al. 2015). Thus, all of the consumers' actions should be noted and a suitable way to do this is through direct observations. Increasingly, observation as a method includes documentation with digital devices, producing data in the form of images or videos. Given the nature of the locations however, it was considered to be more convenient to use field notes, producing short notes and snippets and sketches. Typically, fashion stores are constantly busy with many people coming and going. The use of digital documentation may cause a privacy concern because many people may be incidentally recorded in the documentation. By taking field notes, that privacy concern can be mitigated, the researcher can be more focused on the consumers and participants. In addition, field notes enable the researcher to document the observation with an immediate response – what is observed as important will be instantly noted.

By relying on the senses, observation affords the researcher the opportunity to directly perceive a phenomenon under study and absorb information accordingly (Erlandson et al. 1993; DeWalt and DeWalt 2002). The phenomenon is captured

and transferred into field notes, which can be called as "written photography" (Erlandson, Harris, Skipper and Allen 1993). This also means that at times there is a possibility of missing a moment; this limitation however, can be mitigated with preconceived and focused goals, good timing, and lastly, digital documentation (Goodman, Kuniavsky and Moed 2012; Nippert-Eng 2015; Rogers et al. 2011)

Observation has been used in the field of UXD to understand how consumers use technologies and specifically technological devices (Rogers et al. 2011). While direct observation may take place in various locations, including in the field, it has been mostly been undertaken in a controlled environment, such as a user testing lab whereby participants are instructed to use a specific technological device (Rogers et al. 2011). During an observation in UXD, although the researcher should be open to unexpected actions, a clearly stated goal should still be set so that the researcher can focus on the interaction between a participant and a technological device (Curedale 2013). In addition, other actions when "off" the interaction should also be accounted for, because it may add better understanding of the transition process when people are and are not using technologies. A careful balance between a focus on goals and flexibility is paramount when using observation as a method (Goodman, Kuniavsky and Moed 2012).

3.4.3 Semi-structured interview

Trigwell (2000, p.68) claims that semi-structured are defined by the opportunity to explore "greater and greater depths of thinking without leading". Interviews are seen as a conversational partnership where the researcher probes and supports an interviewee's process of reflection (Yates et al. 2012). The interview questions are designed to be open-ended and semi structured to allow

participants to explore the phenomenon of interest, in this case, consumers' experience. The open structure of questions allows the researcher to pursue unanticipated lines of reasoning that may lead to new reflections (Booth 1997). Interviews will be audio recorded in consent with the participants in order to ease the transcription process following the study.

Interviews will be employed as another method to collect data following the protocol analysis (PA) and observation. This allows the researcher to confirm spoken information and discrepancies from previous methods. Moreover, some information may not be obtained via PA and observation, which can be complemented through interviews. The interview itself will be conducted in situ shortly after the PA and observation methods. It is believed that an interview immediately after an interaction and still surrounded by the physical store atmospherics will engage with the participants' state of mind – maintaining the evoked experience from previously undertaken interaction (Akpan et al. 2013).

3.5 SUBJECTS AND OBJECTS OF THE RESEARCH

3.5.1 Participants in the research

Participant recruitment plan

The technique to recruit participants for this research was purposeful sampling, whereby the researcher identifies and selects potential participants or key informants regarded as information rich and relevant for the research (Creswell 2013; Palinkas et al. 2015). The people or potential participants are assumed to have the potential to inform and provide insights about the phenomenon under study (Patton 2002; Palinkas 2015). Purposive sampling affords the researcher to narrow down the primary source of information. Presumably, the selected participants are more familiar with phenomenon and therefore able to provide

more specific information based on their previous experience and capability during the data collection process (Creswell and Plano Clark 2011).

Prior to the identification and recruitment, the researcher has set the frame profile for better focus of searching. As suggested by Creswell (2013) the research should already have a clear picture of the types of person they want to invite to mitigate irrelevant data and for efficiency. This action, purposeful sampling along with setting an ideal profile for the participants, are reflected in one of the core principles of rapid ethnography strategy, which is motivated looking. The researcher should look for spaces/places and people that are applicable to the research, thus narrowing the scope and shortening the time frame (Millen 2000; Mignone et al. 2009). Moreover, it would help obtain relevant key informants that can provide insights for a phenomenon efficiently (Mignone et al. 2009; Pink and Morgan 2013).

The profile of the participant set for the research is: male and female, 18-34 years of age, lives in London, consider themselves as a digitally savvy person, and have had an experience in shopping both online and in-store. The participants of this research were identified and selected mainly via social networks and messengers. A message that contains a brief description of the research, requirements to participate in this research and contact details, was sent via social media and messengers to the researcher's friends, colleagues and acquaintances. The researcher requested them to forward the message to their networks. Other than that, with his own preconception of the suitable person, on some cases the researcher approached a potential participant directly or through colleagues.

The initial plan was to aim at 35 – 50 people to participate in the study. It appeared that the distribution of the message spread outside the researcher's network; sharing between friends to another friends. This resulted in quick responses in a short space of time. Within ten days, more than twenty people had expressed their willingness to be involved in the research. After receiving

responses from potential participants, they were interviewed briefly via email or messenger. This was to ensure that they fit the profile of participants for the study. One requirement is to have participants that are regular shoppers from either physical store or online store. Thereby, during the data collection process they are more familiar and confident in simulating shopping activities. Lastly, it was expected that the participants would have good communication skills, meaning they have the capability to communicate their opinions clearly and expressive. This trait is essential particularly for protocol analysis. The potential participants were also informed that they will be documented (verbally/audio) and about 2 hours of their time will be needed. Thereafter, initial schedule was planned to make sure they are willing to participate and available on the set date.

One aim was to have an equal male and female representation, preferably coming from working and non-working backgrounds. A specific age range however was particularly sought from the participants, between 18 – 34. This is the largest group to use digital devices among the age brackets (Mintel 2016; Eurostat Passport 2016). Ordinarily, market research or database research categorises age brackets into a narrower range, namely 18 – 24 and 25 – 34. Even so these two age ranges are the highest users of digital personal devices with a tendency to use technological devices (ComScore 2016; Mintel 2016). Other similarities could also be found in these two brackets; they are highly active in using digital personal devices and are very open to using public technology, such as cash machines, self-service checkouts (for example, in supermarkets) and ticket machines (ComScore 2014; Mintel 2015; 2016; 2017; Passport 2016). The 18 - 24 age bracket is more active in using digital personal devices compared with the 25 – 34 age bracket, but the latter is more open to using devices other than theirs.

One interesting characteristic that should be underlined was that the two age brackets are highly open to experiences, in fact expect, experiences fill their lives (Mintel 2017; PSFK 2017; Kantar 2018). On these grounds the researcher decided

to combine the brackets into one., with the aim of obtaining more insights in relation to the research purpose. In terms of gender, although it was not planned initially, female participants were more likely to be recruited because they tend to visit physical store more than their male counterparts (ComScore 2016; WGSN 2017). Moreover, although males can be more confident in using technologies, females are interested in trying new things, including technology (Think with google 2017).

Regarding the number of participants to be recruited, the aim was to recruit more than 30 participants. No fixed number of participants for qualitative research could be found from the qualitative research literature and various sample sizes have been suggested for the best results, ranging from 15 to 50 participants as the minimum or mean (Mason 2010). This range was deemed too broad; moreover, the number of participants generally has to be aligned with the research strategy in use. For example, a grounded theory strategy demands more participants than a phenomenology strategy. Grounded theory seeks to build a theory largely from primary research from iterations of field work. Phenomenology focuses more on the lived experiences of the subjects under study, thus less participants are needed but with longer and more intense interaction. One way to help decide an ideal number of participants is by conducting an iterative process of data collection and analysis with a saturation concept (Saunders et al. 2018).

Participants involved in the research

Within twelve months fifty-one participants were successfully recruited and participated in the primary (research) data collection. All participants were involved in the two main studies of this research. Thus fifty-one participated in the Niketown study, and the same fifty-one people participated as well in the Levi's study. Within the main studies, the data collection was undertaken in clustered, called as data collection activity (DCA). There are three data collection activities in the Niketown study and five in the Levi's study.

For the Niketown, there were fifteen people participated in the first DCA, twenty-four in the second and twelve in the last DCA. There were actually thirteen people involved in the third. But there was a problem with the audio recording; too much noise and unclear verbal report. For this reason, the data was dropped (please see analysis of data for more detail). For the Levis, there were seven in the first, seventeen in the second, eight in the third, twelve in the fourth and seven in the fifth DCA.

3.5.2 Locations/Place of Study

Aligned with interpretivist philosophy and a rapid ethnography strategy, the data collection will be conducted in a real world; a natural setting in which people are shopping inside fashion stores. This will enable the acquisition of research data that is closest to actual shopping activities. Of the many types of fashion stores, the flagship was decided to be the place of study. The term flagship often refers to a single brand's largest and most comprehensive store, which also serves as the hub or principal for all other stores of that brand (Kozinets et al. 2002; Nobbs, Moore and Sheridan 2012). A brand normally invests more on its flagship store and is used chiefly as the channel to enhance brand image and in parallel to provide maximum costumer experience (Moore and Doherty 2007). It is not uncommon therefore to see fashion brands prioritise their flagship store for technological integration.

As part of the research strategy requirement, the locations of the study were decided through a preliminary observation survey of locations. In this way the researcher can filter the most suitable places for the study and also become more familiar with the situation, context and other details (Millen 2000; Rogers et al. 2011).

The fashion flagship stores were in London and the initial observation was carried out in the summer of 2016 for seven days, covering Oxford Street, Oxford Circus, Regent Street, Piccadilly Circus and Covent Garden. A total of 50 fashion stores were surveyed. 20 stores were found to have digital displays, but only seven of them had interactive displays, while others only had passive displays. The observation survey was undertaken again in the Spring of 2017. It was concluded that in-store technologies including interactive and non-interactive were found mostly in flagship stores. The summary of the findings can be seen in the table 1 below.

Brand	Int	Desc.	Content	Pas	Desc.	Content
Nike	Yes	3 systems: (1) Tabletop, medium, landscape. (2) Wall, medium, portrait. (3) Desktop, standard.	Advertising and promotion, e-commerce: (1) Images and motion graphic. (2) Images and videos. (3) Nike ID; similar to website.	Yes	2 types; (1) Large display, (6) medium displays	Advertising and promotion; Latest product, looping video.
Uniqlo	No	-	-	Yes	3 types: (1) Wall & pillar, large, portrait. (2) Wall, medium, portrait. (3) Running text.	(1) Recent promotion. (2) Specific product. (3) Recent product promotion/offer.
Topshop	Yes	2 systems: (1) Desktop. (2) iPad (a few staff).	E-commerce; similar to website.	Yes	2 types: (1) Wall, large, landscape. (2) Wall, medium, portrait.	(1) Fashion film. (2) Recent product promotion.
GAP	No	-	-	Yes	1 type: (1) Wall, small, portrait.	(1) Specific product (Denim).
New Look	No	-	-	Yes	1 type: (1) wall & pillar, small, portrait.	(1) Specific product (by sections).
H&M	Yes	1 system: (1) Standing iPad, landscape.	Customer survey (no reward).	Yes	1 type: (1) Wall, large, portrait.	Fashion film and recent promotion.
Pull and Bear	Yes	1 system: (1) Wall, medium, portrait.	Branded Photo booth, social media connected.	Yes	1 type: (1) Wall, small, portrait.	Showcasing a particular product and/or section
Hollister	No	-	-	Yes	2 types: (1) Wall, XL, landscape. (2) Wall, medium, landscape.	(1) Fashion film and ambience. (2) Recent promotion.
The Sting	No	-	-	Yes	2 types: (1) Wall/window, large, landscape. (2) Wall, medium, landscape.	Fashion film and recent promotion.

Store		Interactive			Passive		
Karl Lagerfeld	Yes	1 system: (1) Wall/mirror, medium, portrait.	Branded photo booth, social media connected.	Yes	2 types: (1) Wall/pillar, medium, portrait. (2) Rail iPad, portrait.	(1) Fashion film. (2) Specific product (by style).
Levi's	No	-	-	Yes	1 type: (1) Wall/window, medium, landscape.	Recent promotion.
Adidas	Yes	2 systems: (1) Wall, small, landscape, screen overlays a shoe. (2) Vending machine (socks).	(1) Product exploration with music (headphones). (2) Various socks.	No	-	-
Oakley	Yes	1 system: (1) desk tablet (Samsumg), landscape.	E-commerce similar to website.	Yes	2 types: (1) Wall, medium, landscape. (2) Wall, medium, portrait.	(1) Fashion film. (2) Specific product.
Karen Millen	No	-	-	Yes	1 type: (1) Wall, medium, landscape.	Fashion film.
Hunter	No	-	-	Yes	1 type: (1) Wall, medium, landscape.	Fashion film.
Penguin	No	-	-	Yes	1 type: (1) Wall, medium, landscape.	Recent promotion.
Hobbs	No	-	-	Yes	1 type: (1) Wall, large, wide landscape.	Fashion film.
Barbour	No	-	-	Yes	1 type: (1) Wall, medium, portrait.	Specific product.
Kate Spade	Yes	1 system: (1) Tablet (hold by staff).	E-commerce; similar to website.	No	-	-
Burberry	Yes	3 systems; (1) Wall, XL, Portrait. (2) NFC mobile and tag integrated. (3) iPad hold by staff.	(1) Showcasing products, fashion film and occasional live stream. (2) e-commerce with special system (only for staff) w guestbook.	Yes	2 systems; (1) Wall, XL, Portrait. (2) Wall, small.	(1) Promotion (2) fashion film, runway from NFC.

Table 1. Fashion stores' technologies observation notes

In summary, of the fifty stores, twenty had digital displays, seven had both interactive and passive displays. Two stores only had interactive displays and eleven stores only had passive ones.

Based on these observations, Niketown and Levi's flagship stores located in the West End shopping area of London were selected for the settings for the studies. Each store has interactive screens that fit the characteristics profiled in the methodology. The details of the stores are discussed next.

3.5.2.1 Niketown London

Image 8. Niketown London store (Courtesy of Porcelanosa Group)

Located in the very heart of one of the most popular shopping areas, on Oxford Street, Niketown stands on 4 floors. From a quick glance, the technology permeating the store can already be seen. There were two interactive screens, six Apple Macintosh for shoe customisation, four Apple Macintosh for football jersey customisation. Other than that, there were non-interactive screens; large video screens in front of the store, after the store entrance, and on some parts of the walls. Comparing direct observations on 2 July 2016 and 17 March 2018, only minor changes were noted on the latter date. The Apple Mac computers decreased from six to four at the shoe area and one interactive screen (table top on the ground floor) was no longer in place on the second visit. But there were more medium size non-interactive screens. They were placed on the ground floor (in the middle of the entrance and by the escalator) and on the second floor (by the football area).

Nike as a brand may not be strongly associated with fashion. Within the past five years however, many online media, such as the Guardian, Forbes, have written about the rise of athleisure, and people wearing a combination of sport and formal outfit for daily activities, including going to work. The phenomenon has

also been corroborated by articles in influential fashion magazines, including Vogue, Elle, and Harper's Bazaar. With all that as the foundation, the researcher decided to choose Niketown London as the first study location.

3.5.2.2 Levi's London

Image 9. Levi's London store (Courtesy of Arcadia Group Ltd)

The Levi's flagship store is also located in the central of a popular London shopping area, Regent Street, which is not far from Niketown. The store has a lower ground or basement floor, but not an upper floor. Even so Levi's store London appears more spacious than Niketown. The technology integration on the other hand seems limited. The store only has two; one, an iPad at the till used by staff for internal purposes; the other is an interactive screen which was used for this study.

3.5.3 Stimulus – Interactive technology (IT) in fashion stores

The IT in Niketown was entertainment-centric. The content provided short films and storytelling images for the users. The IT was installed on the first floor, was attached to a wall and its size was approximately 48 inch and the orientation was

horizontal/landscape. It was located between two large walls that created a corner, which appears to be a dedicated area for the user. This installation forces a user to face the IT and walls. A user could see the surrounding store environment only by looking left, right or turning around completely. On the right-hand side Nike Golf and Tennis areas can be seen. On the left-hand side was the Nike Skateboarding area. The colour of the walls was black and was decorated with graphics and neon signs relevant to the content of the IT. Although the frame and rim of the IT still can be seen, it seems blended with the elements that surround it. The IT displays a looping video of people running at the "homepage". There was an invitation text written "Swipe to Use" at the middle lower level overlaying the video. The IT can be navigated by swiping the screen left or right to move between options and tapping to select. There were three (3) main menus and 3-4 submenus. The content is a combination of graphics, images, videos and texts. Very visually driven, the IT contains a number of short videos.

Image 10. Niketown London IT

The IT in Levi's London, following the definitions in the literature review, can be described as 'product-centric'. It functions as a device to create a customised logo T-shirt, and a user can then pay and have it ready instantly. The IT was installed on the ground floor. The orientation was a vertical/portrait style and the approximate size was 32" high but slimmer in width. Unlike the Niketown IT installation, the screen in Levi's was not attached to a wall, but rather it used a screen stand placed on a special desk as part of a modular system. The space

was also decorated with a backdrop, some mannequins and hanging banners logo. All this was located at the middle part of the store by the entrance. The Levi's store entrance has two double doors separated by a wall (see the image 10 before). Thus, when someone enters the store through either door, the IT area will not be obstructed. In fact, it serves as an island style divider providing ways to further enter the store. Given the location, a Levi's IT user would be able to see the inside of the store without having to turn their back. A user can look around more conveniently to compare what is on screen with the physical store than with the Niketown IT. There was no homepage on the IT but a user is presented straight away with options of the t-shirts divided into six windows. The way to navigate this IT is by tapping only.

Image 11. Levi's London IT

3.6 PILOT STUDY

As part of the work to evaluate the suitability and feasibility of the methods, a pilot study was conducted. This way, researcher would be more confident in applying the methods. Most importantly, the pilot study helped improve the data collection process and producing a more solid and high validity data.

Niketown in London was chosen as the location for the pilot study. Niketown has long been known as a hi-tech apparel store, with a focus on interactivity with

consumer (Von Borries 2004; Quartz 2017). Touchscreens, computers and other technological devices permeate the three floors of the store. The staff were also friendly and non-intrusive, and given the place is considerably large, it provided more space, despite the busy environment. It was assumed that this would help make participants to feel more comfortable and confident. The pilot study was conducted over two weekends (Saturdays in July 2016) and one weekday (Monday, in August 2016).

The stimulus (IT)

As previously discussed, the stimulus interactive display was attached to a wall and has a 48" horizontal display. It was located on the first floor between the Nike SB (skateboarding) and Nike Golf sections. A looping video with a cue to swipe could be seen immediately in the starting point. It used both swipe and tap type navigation. There were three main menus and 3-4 submenus, which offered images, videos and motion graphics. This interactive display was also visually driven but with more videos.

Participants

Seven participants were recruited for this pilot study based on the aspects that would fit the profile; a purposive sample to ensure they were digitally-driven, experienced in online shopping and interested in or owners of Nike products. There were four females and three males and the age bracket is 23 - 29. The majority of them had professional occupations (five participants) and there were three students. All participants were fashion conscious, digitally active and had experience of online purchases.

Procedure

Participants were instructed to explore the interactive in-store technology while talking about what they thought of and felt about the displays out loud. The participants were not directed towards the IT and had to find both themselves. They were each given a time slot to explore the interactive displays individually

and with no time restrictions; two on the first protocol analysis (16/07), three on the second (30/07), and two on the last one (08/08). No time restriction was given. The tools used to record participants' verbal reports were an iPhone and earphone, a Sony digital recorder UX533 and an external clip mic (last protocol analysis).

On the first protocol analysis, each participant explored freely and only received minimum guidance from the researcher. Then for the second, each participant was given a cue card containing a simple guide of what to express based on McCarthy and Wright's (2004) framework. Researcher gave a minimum guide. Finally, on the last one, each participant was given a cue card and was also intensely guided. This treatment seemed to be the most effective to produce more data.

A brief semi-structured interview was conducted in-situ following each protocol analysis. Notes were also taken throughout. The notes documented how participants behaved during the process; this covered bodily activities such as the way they walked, approached and stood during interactions, how they tapped (left or right or both hands, fingers, effort in pressing) and their facial expression. The researcher shadowed each participant during the exploration and took notes to document how participants behaved during the process.

All data were analysed thematically and went through two stages of coding, selective and open. The majority of participants became more relaxed after getting into the interview with the researcher. They had various ways of delivering the verbal reports. For instance, one participant seemed comfortable talking as if she was presenting to someone else. A total of one hundred and ninety-seven (197) excerpts of meaning were drawn out from the transcriptions, which were coded using McCarthy and Wright's (2004) four threads of experience; sensual, emotional, compositional, and spatio-temporal. Further, the excerpts of meaning (codes) were evaluated to avoid redundancies. Thus, some were merged

according to the underlying meanings before being finally categorised. At the final stage, there were sixty-four excerpts of meanings categories into twelve initial themes. These are then re-evaluated before finally finalising the themes.

Findings

In sum, the pilot study generated twelve themes of in-store touchscreen experience in the four threads of experience (4TE). The themes were digital environment, product presentation, object salience, interactivity, brand salience, model/endorser, aesthetic information, relevance, useful information, pathfinding, object location and content update. The representation of the interwoven themes can be seen in the figure 4 below.

SENSUAL Digital environment Product presentation Object salience Interactivity	EMOTIONAL Brand salience Model/endorser Aesthetic information
COMPOSITIONAL Relevance Useful information Pathfinding	SPATIO_TEMPORAL Object location Content update

Figure 3. The 4TE as the lens for the pilot study analysis

Sensual Thread

There are four themes that are generated within this thread. These are digital environment, product presentation, object salience and interactivity. In essence, sensual was revealed as the most dominating thread from both displays. As mentioned previously in the literature review, sensual refers to human sensory perception. Visual (sight), as might be expected, seems to be the most dominating sensory perception, as participants were able to immediately perceive and identify all the visual cues on the touchscreens. They are actually

seeing what can be called as a user interface (UI), which includes, colours, graphics, texts, images, and layout. All this leads to the construction of the first theme that is the digital environment.

"… right now I can see a menu where, you know, I can see some graphic thing, some analysis, run…so… Nike plus run club…I touch it and it shows the next menu..." (M, Female)

"...ok, this is very colourful..." (E, Male)

They also acknowledged the necessity of high quality and animated images. The images contained the products and general merchandise and were considered as important because it would intrigue them to explore more. Moreover, the participant would highly rate the brand and their interaction based on these. Product presentation is therefore essential and forms the second theme.

"…the slow mo(tion) is fantastic...and epic..." (S, Female)

"... you can see the detail here… very detailed, as if it's the real texture..." (MK, Female)

Correlated strongly again to visual sensory perception, the physical object visualisation was also evident. It is more about how the touchscreens as objects were positioned, installed and cued. Most were able to identify the touchscreens easily because they were well positioned and supported with cues that helped attract eyes to the screens. This constitutes the theme object salience.

"…the size and visual matches the stuff surround it..." (J, Male)
"... well, I can see it is a fantastic image and ... clear buttons..." (K, Female)

Obviously the participants were able to interact with the touchscreens. It can be argued that interactivity is the most essential theme within the sensual thread. A combination of visual and tactile sensory experience was evident when

participants interactively tapped the surface and system of the displays to navigate.

"...So, I can click this image? Oh yes, it's working. Everything here is clickable…" (S. Male)

"... this swiping thing is very confusing (frowning expression) ..." (S, Female)

Emotional Thread

This thread covers three themes, which are brand salience, model/endorser and aesthetic information. Emotion came out as the second most salient experience thread, and touches both positive or negative feelings. There is also a strong interplay between sensory and emotional themes.

It was apparent how Nike, as a brand, influences the participants' emotion. They seemed to be affected immediately the moment they entered the store. Such brand influence similarly applies to their interaction with the touchscreens. Another theme that played a strong role in evoking a positive emotion, brand salience, was generated.

"… what I like about seeing a Nike ad is, I feel I'm instantly energised..." (MK, Female)

It is evident that the emotional thread derived from and informed the sensory thread. The selection of a model impacts on the participants emotion and the evoked emotions can be either positive or negative. This being said, the next theme that was produced was models/endorser.

"… I would go for Ronaldo (menu option for football), but since he is not my favourite player, I'm gonna go for the woman (menu option for women apparel) ..." (S. Male)

"... although I'm not a diehard fan of Nike, I like the way they show various normal people doing sports. Yeah, they have some celebs, but mostly normal*..." (K, Female) [normal people refers to common people that is not a celebrity but in fact are models]

Information conveyed by the touchscreens was found to be inspiring and therefore created a positive emotion. The information can be in the form of images, videos or texts. This sort of information can be regarded as aesthetic information/inspiration and becomes another theme.

> "... Oh, so pink [shoes] looks nice with these dark blue socks…" (S, Female)

Compositional Thread

Within the compositional thread, three themes were identified. This thread came out as the third most salient. It can also be seen that the compositional thread is linked to sensory and emotional threads.

Compositional, which is considerably similar to cognition and narrative perception process, showed a particular strong link with the emotional thread. Participants were seemingly critical or logical in regards to the information - texts, images, videos – that were presented. For this reason, they would expect relevance, which are another theme.

> "… Man[chester] City? Why Man City in London? It's a bit weird that they are advertising Man City in London, right?" (S, Male)

Previously, it was found that the information from the touchscreens could be inspirational. However, participants naturally expect to get information that is beneficial for them, which in turn may influence the emotional thread. Thus, useful information is the next theme that was constructed.

> "… oh, running every Thursday. It is free and open to runners of all level. So, even I can join…" (J, Male)

Somewhat tied to interactivity, the steps and flow of the system is essential. A clear direction and easy-to-find elements make the participants feel more efficient. A clear and easy path for the menu and system structure should be strongly accounted therefore. This is another generated theme, pathfinding.

"… hmm, the menu is a simple and quite unpredictable tap..." (K, female)

Spatio-temporal Thread

Spatio-temporal theme emerged as the least salient thread and was found to be closely correlated with emotional theme as well. This thread carries 2 themes, which are object location and content update.

The saliency of the touchscreens as objects was mentioned in the sensual thread. How the touchscreens are located seems to have a strong influence towards the activity. Participants may see and attracted to the touchscreens easily, however the surroundings are another factor to be considered. In this case, both of the touchscreens were strategically located. Therefore, the next theme, object location, is of equal importance.

"…it has its own space and you can just feel relax, chill, more comfortable. There are less people..." (M, Female, 25)

"... yeah, I just think that most displays can be clicked [interactive]. And it's quite visible so I think I just want to try and touch it. Oh, and it's close to the shoes [area]..." (J, Male)

Lastly, although information can be inspiring and useful, it should be regularly updated so it stays relevant and current. It was found that the digital content was expected to be refreshed often in order to keep being interesting to be used. This generates the last theme that is content update.

"…but I don't think I will use this again next time because I already know the content..." (S, Female, 24)

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Discussion

The themes that emerged in the findings highlight the sensual thread as the most salient of the four threads; a significant number of excerpts of meaning were linked to this thread as well as four of the themes. With these relationships, irrespective of the intention or motivation, human sensory perception is paramount and should be accounted for in designing a retail technological innovation. Human sensory perception is effectively the tool to experience something and aligns with one of the core assumptions of user experience design, which posits that perception is in the heart of the experience of the user (Hassenzhal 2010). Central to these findings is how the emotional thread ties all the threads together, which supports Forlizzi and Battarbee (2004) findings that emotion is present in the aspects of experience.

The findings further show that the experience themes are both utilitarian and experiential. The former concerns efficiency, and is constituted by product presentation, interactivity, relevance, useful information, pathfinding, object location and content update. The latter by contrast reflects a more experiential core. It is something that can be associated with pleasure through enjoyment, entertainment and aesthetic experience. Its themes are built on the digital environment, object salience, brand salience, model/endorser and aesthetic information. Both aspects not only go back to the basic definition of UX design that advocates efficiency and pleasure, but also to the suggestion of how a retail technological system should account for experiential values (McCarthy and Wright, 2004; Pantano, 2016).

Interactivity is particularly significant as users engage with technologies in both themes. The interactivity of a touchscreen can serve as a tool or way to achieve something; in fashion stores, to search for a specific product and a transaction to buy the product. Besides this, the interactivity itself, as an act or movement can be enjoyable, partly because consumers can feel that they are actively involved

and stimulated. Furthermore, as discussed in the literature review, interactivity can be viewed as feedback, communication and stimulation (Varadarajan et al., 2010; Hassenzahl, 2010). This points again to the shift of the concept of service technology in retail. A touchscreen in a store can be more experiential regardless of the actual function. There are other factors that make this possible, for example aesthetic information. When applied appropriately therefore, the interactivity found in a touchscreen can create a 'change' or 'growth ideas', which further contributes to innovation in retail (Hristov and Reynolds, 2015).

As noted by McCarthy and Wright (2004), by identifying and understanding experience themes with technology, a design strategy for experience may be better achieved. A design-led retail technology innovation can be informed by the experiential quality themes found in this study. However, the success indicators for a "great" experience are relative and beyond the scope of this study.

Conclusion

The pilot study has successfully produced findings. Although it is still at the stage of testing, some interesting provisional codes could have already been generated. This should mean that the design of the methodology is effective. In essence, there are two important findings from the pilot study. These are the effectiveness the combination of methods for data collection and the application of McCarthy and Wright's (2004) the four threads of experience framework for data analysis.

The combination of protocol analysis, observation and interview (POI) has worked well in generating relevant data that can help achieve the aim of this research. As discussed in the methods subchapter, many UXD studies have used protocol analysis, observation and interview as methods for gathering data.

However, the studies normally apply only one or two methods, for instance a combination of protocol analysis and observation. This research devised three methods with the aim of acquiring richer and thicker data. Moreover, this research wanted to address one of the key principles of rapid ethnography that is interactive observation; gathering as much data as it could via multiple techniques. The POI has worked well as each method complements the others and as a result produced codes constructing the findings.

For the data analysis, McCarthy and Wright's (2004) the four threads of experience framework also worked well. This is particularly for the first stage of the coding process (selective coding). However, open coding should also be undertaken at the next stage to elaborate and obtain additional codes that might sit outside the framework. The codes that have been generated, were aligned to the framework and can be positioned accordingly as displayed in figure 3.

3.7 RESEARCH IMPLEMENTATION & PROCEDURE

3.7.1 Primary research implementation

Following the methodological plan, a timeframe to conduct the data collection was established. The whole second year of the research was dedicated to data collection, but rather than having full-time or continuous data collection however, sets of smaller data collection activity were favoured. User experience design literature notes that conducting multiple studies, whether conducted in parallel or not, are more effective in gaining more and better-quality insights (Kuniavsky 2003; Miller 2015). Conducting multiple studies also enables the researcher to plan and manage the data collection more efficiently (Gothelf 2013; Bluey 2013).

Another reason to set and implement two main studies was for practicable data collection reasons. It was aligned with one of the advantages of rapid ethnography. Having multiple data collection activities enables the researcher to maintain control and focus of the research, given the nature of the settings that are regarded as the 'third place' (Millen 2000; Pink et al. 2017). The 'third place' is in essence a public place outside home and work environment where people come together to socialize or gratify their needs (Memarovic et al. 2014). It is a neutral ground and usually change over time (Paul et al. 2008). Fashion stores are public spaces, which are a neutral ground and constantly active, meaning they are prone to changes. Smaller data collection activities afford the researcher to manage the data collection implementation aspects better, for instance schedule (date and time), participants and the POI process. In addition to that, such activities provide the researcher more time to analyse the on-going data, which was happening between each data collection activities.

In total, the process of data collection and iterative analysis lasted for fourteen months, from September 2016 to November 2017 with a two months gap between main studies. Two main studies were successfully implemented in Niketown London and Levi's London. These studies incorporate a total of eight smaller studies reflecting the rapid ethnography research strategy. It should be noted that the Niketown study had successfully involved fifty-one participants. The same participants took part again in the Levi's study.

Additionally, the literature review in this thesis synthesised that interactive screens can be categorised into experience-centric and product-centric. In the methodology chapter it was decided that the studies should involve those two types of interactive screens. This plan can also help increase the reliability of the qualitative data. The interactive screen in Niketown falls more into the experience-centric type. Therefore, to ensure the codes covered both types, a study involving product-centric interactive screens was organised. This time the

study was conducted in Levi's flagship London (see the methodology chapter for details).

On the grounds of data collection delineation and clearer thesis presentation, the main studies at Niketown London and Levi's London were named "study", while the smaller ones, in which the POI was undertaken, were named "data collection activity" (DCA). Each data collection activity (DCA) consists of protocol analysis, observations and interview (POI) methods coupled with iterative analysis. A DCA is marked sets of POI happening within six weeks. A DCA was also set/decided based on the situation and condition. For example, where there were no available participants or a special event in the store. Time period between each DCA was used to conduct more intense analyses. To clarify: a "study" contains several "data collection activities" (DCA). And a DCA contains sets of POI

There were eight DCAs in total for the data collection and iterative analysis process. Three DCA were conducted in Niketown London and five in Levi's London. The length of each DCA varied, ranging from 2 day activities up to 38-day activities. The DCAs covered all store opening hours; morning, afternoon and evening. The details of the primary research implementation can be seen in the diagram presented next.

STUDY 1			STUDY 2				
DCA 1	DCA 2	DCA 3	DCA 4	DCA 5	DCA 6	DCA 7	DCA 8
15 POI	24 POI	12 POI	7 POI	17 POI	8 POI	12 POI	7 POI

Figure 4. The primary research implementation

3.7.1.1 Study 1 - Niketown Store

The study was conducted at Niketown London. It was undertaken for five months from September 2016 to February 2017. There were three data collection activities (DCAs) within this study. In total fifty-one people were involved in the Nike town London study. The first data collection activity (DCA 1) in Niketown was conducted between 12 - 30 September 2016 (approximately three weeks; 19 days). Fifteen (15) participants have successfully participated in this DCA 1. Nothing had changed in the store during the DCA 1 period. The second data collection activity (DCA 2) involved twenty-four participants. This DCA 2 was undertaken between 14 November – 21 December 2016 (approximately five weeks). Given the timeframe, Christmas festive themes and decoration could be seen during the DCA 2 period. Despite that, IT in the store was not changed nor relocated. Observation notes recorded that the store crowd and traffic were increasing. But this did not seem to impact on the POI process and DCA overall. In fact, each POI went much better because of the crowds and the participants were more mixed with other store visitors.

The last data collection activity (DCA 3) for the Niketown was undertaken between 9 January – 12 February 2017 (approximately 5 weeks). There was an eighteen days gap (Christmas and New Year 2017) between DCA 2 and 3 which was used to analyse the ongoing data. In this DCA 3, there were twelve participants. This was the period after the New Year festivities. Despite the sale promoted in the store, fewer people could be seen in this period. Fifty-one people participated in the Niketown study. As planned, the same fifty-one participants were recruited to participate in the next main study at Levi's. This is reported next.

3.7.1.2 Study 2 - Levi's Store

The Levi's study is the second of two main studies in this research. It was planned and implemented as part of the rapid ethnography strategy, as multiple studies are required in the short period of time of the data collection (Millen 2000; Pink et al. 2017). There was a pause for about two (2) months (56 days) after the Niketown study has ended before conducting this one. The pause was used to manage and prepare the Levi's study, including but not limited to schedule, participants. This study has successfully managed all fifty-one participants who have participated in the Niketown study.

Due to the process of managing the participants from the Niketown study again, the Levi's study took longer time that is seven months. There were five data collection activities. Given that the DCAs are part of the larger research of this thesis, for practicable and clarity reasons they were labeled DCA 4 – 8.

Data collection activity four (DCA 4) was conducted for a week between 10 – 17 April 2017. Seven people were involved in this first stage of the study at Levi's store. Re-recruiting the same participants from the Niketown study to take part again was the chief reason for the low number of participants; the challenge came from the motivation to participate and managing the schedule. DCA 4 was also useful for the researcher to familiarise him with the situation and condition where the study took place.

The next one (DCA 5) was implemented between 13 – 28 July 2017 (16 days). This time there were seventeen participants. Regarding the store's atmospherics and IT, there were no significant changes between this and the earlier stage of fieldwork in Levi's. Only a few posters and banners showing new promotions that had been added. The store crowd was relatively normal and not too busy in despite the summer promotions.

Data collection six (DCA 6) was the shortest in terms of length. It took only two days (20-21 October 2017) and eight people participated. This was due to schedule cancelations from several participants. Although they requested for a reschedule (the following day after next), it could not be implemented as the researcher needed to go back to Nottingham. On day two the POI lasted until the evening approaching store closing. This was the latest POI execution. There were some changes from the store that is the IT has been removed to the centre area of the store. This includes the IT, modular desk, backdrop and posters. The design of the backdrop and posters at the time showed promotions in relation to the customised t-shirt and new logos. The IT area was placed sideways. The front side of the IT area faces the till area, while the back side was the foyer (stairs to the basement).

Data collection activity seven (DCA 7) was also considerably short. It was undertaken between 17 - 19 November 2017 (3 days). Twelve people took part in this DCA. No changes could be seen from the store despite it was approaching Christmas period. What could be found were only medium size posters informing student discount. The crowd was also relatively normal, similar to the situation from the previous DCAs.

Finally, the last data collection activity (DCA 8) was conducted between 27 – 30 November 2017 (4 days). The remaining seven participants have successfully partaken in the DCA. On this period of DCA, no significant changes could be found from the store. Some rails and merchandise slight movement could be seen. Similar to the other DCAs, on DCA 8 the process was undertaken throughout the day. The state of the store was not too crowded and still can be said as normal crowd.

In sum, the data collection lasted over fourteen months with two months gap. The details of the two studies and eight data collection activities can be seen in the figure shown below.

2016				2017				
14 months data collection and analysis								
STUDY 1 - NIKETOWN (5 months - 51 Participants)			Gap 2 months (56 days)	STUDY 2 - LEVI'S (7 months - 51 participants)				
DCA 1 12-30 Sep 2016 (19 days)	DCA 2 14 Nov-21 Dec 2016 (38 days)	DCA 3 09 Jan-12 Feb 2017 (35 days)		DCA 4 10-17 Apr 2017 (7 days)	DCA 5 13-28 Jul 2017 (16 days)	DCA 6 20-21 Oct 2017 (2 days)	DCA 7 17-19 Nov 2017 (3 days)	DCA 8 27-30 Nov 2017 (4 days)
15 POI 15 participants	24 POI 24 participants	12 POI 12 participants		7 POI 7 part.	17 POI 17 part.	8 POI 8 part.	12 POI 12 part.	7 POI 7 part.

Figure 5. The primary research implementation 2

3.7.2 Methods procedure

There were three methods used for the data collection; protocol analysis, observation and interview. The decision to use these methods was partly because they have been used before in many user experience design studies, both academic studies and industry studies (for instance Van Waes 2000; Li et al. 2001; Arhippainen and Tähti 2003; and Studies at Nielsen, Dentsu, R\GA). For clarity and efficiency reasons during implementation and write-up, the three methods for the data collection were labelled as POI (Protocol analysis, Observation and Interview). The procedure is thus particularly focused on the implementation of the POI.

Each participant of the research went through the POI data collection. Everyone was given a slot for participating individually, meaning one participant - one POI. Maximum of four participants were scheduled for one day to achieve greater control over the situation. For instance, if the participant arrived behind the schedule, to adapt with the store situation and for a good spare transition between each participant.

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The researcher met each participant either in a café nearby or in front of the store. Although all participants have been briefed before via email, everyone was briefed again before the POI about the research that is interactions with IT. Moreover, all participants were told to relax, and informed that there was no wrong answer as the key aim was to gain the details of their experiences. Two audio recorder devices were prepared, a Sony digital audio recorder with external microphone and Apple iPhone with hands free kit. Each participant was asked to wear the both recorders to ensure good data capture. At the appropriate cue the researcher and the participant would enter the store.

The POI starting and end points are from the moment the participant and researcher enter the store until both exit the store. However, the intensity of the POI is increasing in specific timing brackets. This starts when a participant has seen the ITs and ends after the brief interview. The Intensity of the POI is illustrated in the diagram/figure below.
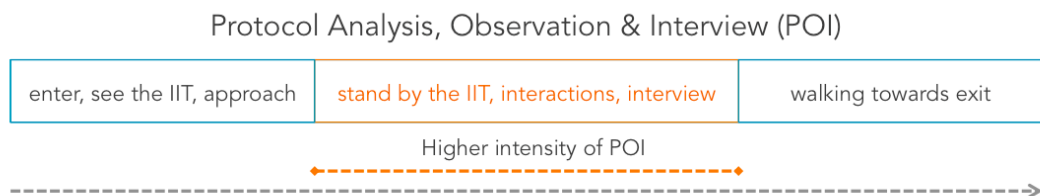

Figure 6. The intensity of the POI

In the implementation, the methods protocol analysis and observation were worked first. This started shortly after entering the store, and the intensity is increasing when a participant starts using the IT. The intensity here means a participant would be nudged to do the protocol analysis more and the researcher would do more note taking and sketching (observation). The researcher walked with the participant most of the times during POI. During interactions with IT, the researcher would position himself according to the required standing position.
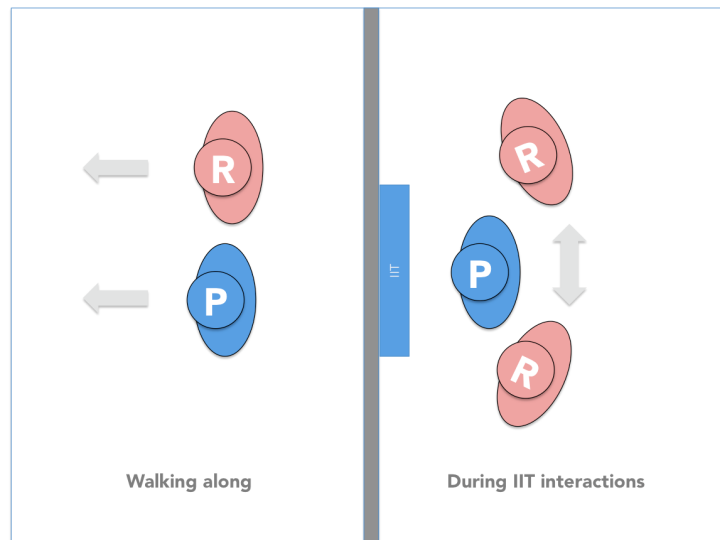
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Figure 7. The positions of the researcher during POI

The interview was carried out promptly after the protocol analysis and observation had ended. This is when a participant implied or said that there nothing could be expressed further. In a few cases, such as when a participant seemed quiet or confused, the researcher was the one who confirmed the end of the protocol analysis and observation. The interview was conducted to ask questions that were not covered using the protocol analysis and observation methods. It was also used as a way to confirm findings. For example, discrepancies between movements, expressions and saying and when interesting notes had been previously taken and needed further explanation.

3.7.3 Ethical consideration

The ethical aspects of this research are of high importance. The data collected was protected not only by maintaining the confidentiality of the participants but also by making sure the data itself is secure and only the researcher that has the access. Another reason is because the data collection was undertaken in fashion stores that are a public space. Incidentally, people could possibly be involved

and/or affected by the process. The researcher has taken every precaution to protect the confidentiality, privacy and identity of the participants and people. Furthermore, the researcher did not disseminate any research data without the explicit consent of those involved.

For both the pilot study and the primary research data collection, confidentiality and privacy procedures to protect the anonymity of the participants and the data were followed. In particular, the researcher adhered to the Nottingham Trent University ethical guide. The researcher also completed an ethical clearance form that was reviewed and approved by the Joint Inter College Ethics Committee (JICEC) for the College of Art, Architecture, Design and Humanities and the Centre for Academic Development and Quality (CADQ).

During the implementation of the data collection, the researcher followed the procedure of requiring participant to complete a consent form before collecting data and defined the purpose of the research and the right of the participant to withdraw from the research before, during or after the enquiry. Regarding the observation, rather than taking photographs, the researcher took notes and sketches. This way, the (observed) data could be captured without having to breach the privacy of people surround.

3.8 ANALYSIS OF DATA

All the data obtained from POI was analysed using a thematic data analysis. Thematic analysis identifies, analyses and presents patterns (themes) containing relevant insights within the data (Boyatzis 1998; Braun and Clarke 2006). A theme is a representation of narratives emerged from the data in connection to the research questions (Creswell 2014). Themes moreover represent some level of patterned response or meaning within the data set (Bryman and Burgess 1994). Thematic analysis is an analysis process acknowledged in social science research

given its capacity to produce and present qualitative data efficiently (Bryman 2015). More importantly, research in the discipline of user experience design has utilized thematic analysis (Rogers et al. 2011; Blandford et al. 2016)

It should be highlighted that the data analysis was undertaken iteratively; some data was already analysed before the data collection (DCAs and Studies) has ended. Not only this process is aligned with a user experience design research (Buley 2013), but also convenient for the data collection process as it provides a greater sense of control over the time and schedule.

The data analysis went through several stages. The first stage was to analyse the observation (the O of the POI) notes and sketches. This will help simplify the mixed data, thus would make the thematic analysis of the protocol analyses and interviews data more efficient. The second stage is to transcribe all audio data (from PI of the POI). The third stage was to analyse the PI data into codes before generating themes. On this stage the themes generated from the first stage were used as part of the analysis. The last stage was to re-analyse the themes and create diagram of saliency/hierarchy.

Stage one: Observation analysis (POI)

The first stage was to analyse the notes and sketches from observations. Throughout the data collection activities (DCAs) the researcher used hundreds of pages of several notebooks. Naturally however not all of them were useful or relevant. Such a condition is considered as normal given the quick documentation action used in observations (Angrosino 2007; Marvasti 2017).

Observation can be the primary method in ethnography, but it can also be positioned as supporting method (Malderez 2003; Rogers et al. 2011), which is the case for this research. This is because the observations were undertaken in parallel with the protocol analysis. As a result, the data gathered was less than a study that used observation as the main method. To briefly re-explain the

observation subchapter, this method was planned and implemented to strengthen the protocol analysis. This means that the observation was positioned as the second method. With such positioning therefore, the data gathered should not outweigh the first method (Lareau and Shultz 1996). Nevertheless, of course the data needed to be evaluated to make it more relevant and make sense.

All notes and sketches were first evaluated to make sense of the relevance, which is also the way for filtering; subsequently everything was then labelled (Nippert-Eng 2015). Such a process is quite similar to coding transcription from audio data, although not as intense or as deep (Elliot and Timulak 2005; Marvasti 2014; Horne 2017). The observation data is in the form of short handwriting texts and sketches. Some of the data forms can be seen in the appendix.

Generally, all the labels were made concise with the aim to have easier access on the next stages of analysis. Further, the labels were categorised into two distinct functions that are: for confirming and contains something. For confirming has labels that would help clarify some units of meaning/codes (on stage three) from audio data that needed further explanation. Meanwhile the labels in contains something function more than just for confirming the audio data. It shows an early emergence of important data in relation to behaviours or actions when using IT. The early important data is mostly in the form of sketches; they capture the users' positioning, motion as well as reactions. To note, apart from supporting other methods observation was planned and implemented to response the research question two (RQ2): "how do consumers interact with IT?".

Stage two: Transcribing audio data (POI)

The next stage was to have all audio data from the protocol analyses and interviews transcribed. All that was done verbatim. The transcribing process itself can already be considered as a first analysis process before the actual analysis, as it involves interpretive process (Bailey 2008). Thus, during transcribing process, interesting and relevant notes were taken. These were then used for stage three, the main analysis.

To restate the participation, fifty-one participants were involved in the two main studies (Niketown and Levi's London). As a result, the activities produced fifty-one audio data (AD) from Niketown and fifty-one from Levi's, thus in total one hundred and two. Each AD contains verbal documentation/recording of the protocol analysis in the first part and brief interview in the second part.

Stage three: Analysing the transcription (POI)

In the third stage, all transcriptions were analysed. There were four steps in analyzing the transcriptions: read and understanding, units of meaning generation (coding), units of meaning evaluation and categorisation by themes or themes creation. These steps have been acknowledged in both general social science qualitative research and specifically user experience design research (Miles and Huberman 1994; Bryman 2015; Blandford et al. 2016).

Read and understanding the data
The first step was to read the transcriptions quickly (skim read). During this process some interesting points could be identified but not yet noted. Those points however helped to understand the context again and flagged some areas

needing to be analysed further (Boyatzis 1998). This reading for understanding process helped to have a better understanding of the texts.

Units of meaning generation (coding)

That step was followed by interpreting and converting the texts into units of meaning or also known as coding process. In essence units of meaning (UoM) is one standalone sentence that derived from the transcription and embodies a meaning without having to rely on the previous or next sentence (Bryman 2008). As also suggested by Elliot and Timulak (2005, p. 153) "Meaning units are usually parts of the data that even if standing out of the context, would communicate sufficient information to provide a piece of meaning to the reader".

Meaning units can be created from a single sentence, a few sentences or even the whole paragraph (Miles and Huberman 1994). Moreover, they can carry meanings projecting either positive or negative opinions/responses. For example: "Nike advertisements able to visually stimulate a user" contains positive opinions/responses and: "More menu options are not always better" contains negative opinions/responses.

Given the considerably large number of participants, and the nature of protocol analysis that tends to produce much data, there were a large number of units of meaning (codes) that were generated from the process; resulted over one hundred. Nevertheless, this is common to be found in qualitative research given the disparity of opinions and meanings from participants' responses. Moreover, given that it is the first step of the coding process, there were some units of meaning that were somewhat similar and seemed possible to be merged or deleted (Silverman 1993; Blandford et al. 2016). The large number is reduced on the next step.

Units of meaning evaluation

All the units of meaning (codes) were then re-analysed as a means to increase the capacity as well as to avoid duplicates. At this stage the data is also reduced in order to increase the quality; all this was done by discarding irrelevant information (Miles and Huberman 1994). Consequently, some were merged some were deleted. A user experience design framework by McCarthy and Wright (2004) that is *the four threads of experience* (4TE) was employed for this analysis process.

The 4TE was also used for the analysis of the pilot study. Theories can be utilised used as a research guide for qualitative research (Bryman and Bell 2013). However, theories, models or frameworks are not used in a restrictive manner given the explorative nature of qualitative research (Creswell 2013; Bryman 2015; Blandford 2016). More specifically, Ethnography based research, especially those with limited timeframe acknowledged the use of theories as well; in fact, theories should be used to maintain consistency and focus of the phenomenon being investigated (Pink and Morgan 2013). Theories, models or framework can be utilised accordingly for reviewing literature, methodology including data collection and analysis processes. Thus, the 4TE was employed as the lens in the third stage of the analysis of the primary research data.

Following the process undertaken in the pilot study, all codes emerged at the second stage were positioned within the threads; sensual, emotional, compositional and spatio-temporal. There were codes that read similar to those from the pilot study, for example *useful* and *aesthetic information*. However for originality and newness purposes the researcher focused on developing codes with the 4TE without adhering to the pilot study findings. Therefore the codes developed were purely constructed from the primary research data.

The codes were reduced from thirty three to nine. Many were merged because they were closely related. As a result all nine codes carry strong insights reflecting the primary research data.The positioning of the codes within the 4TE can be seen in the figure 8.

SENSUAL Within the frame Beyond the frame Merchandise detail Physicality	EMOTIONAL Artistic inspiration Merchandise motion
COMPOSITIONAL Useful information Interaction command	SPATIO-TEMPORAL Situatedness

Figure 8. Initial themes position within the 4TE

Other than that, labels from the stage one (observation) were also used to analyse the UoM. These helped to have a deeper understanding of each the UoM, thus helped the decision-making when merging and deleting everything that has been generated (Rogers et al. 2011). As a result, the UoM were reduced down to half from the original number.

Categorisation by themes

The last step was to categorise the final codes into themes. In this step the *four threads of experience* (4TE) frame was released from the codes. The reason for this is to support the process for answering the research question one without limiting the findings within the frame of 4TE. The research questions one is: *What is the interaction experience that consumers elicited from interactive technology in fashion stores?* The nature of question is explorative; aims to find new

understanding of experiences with interactive technology in fashion stores. Thus the nine codes were reevaluated, subsequently categorized under main themes, which are higher order of themes. After the main themes were developed, the codes were then positioned as subthemes. This theme categorization process is one qualitative analysis to present data effectively (Saldana 2009; Bryman 2015). The first main theme that was created was also most salient, it was named *split domain*. This theme was built from a combination of *within the digital frame* and *beyond the digital frame*. *Split domain* projects insights and narratives in relation to how the users experience stimuli. One compelling thing to note is that it covers both elements of the domains of physical and digital. Both have an aspect connecting them into strong visual stimuli. Essentially the theme split domain concerns perception process leading to experience with interactive technology. *Interactive information* was the next main theme created. *Interactive useful information* and *interactive artistic inspiration* were the codes within this theme. Interactive information refers to findings about all the content on the IT system that is the stimuli. Main theme number three created was named *digital domain merchandise*. While this is also correlated with elements of stimuli on IT, it displays different narratives and insights from interactive information. This theme incorporates *merchandise motion* and *merchandise detail*. The last main theme was named *interaction moments*. The codes *physicality*, *situatedness* and *interaction command* built this main theme. Although created the last, it is actually the second most salient theme. This theme contains interrelated but novel narratives and insights connecting experience process and stimuli. As such interaction moments is the axis for other main themes. The initial positioning of the themes can be seen in the figure shown next.
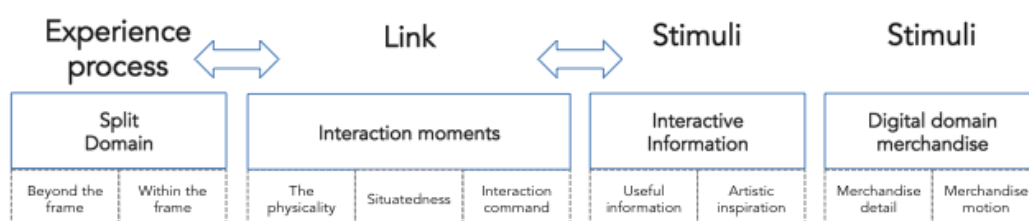

Figure 9. Initial connection between themes

Stage four: Themes re-analysis (POI)

In the previous stage the themes were created. Each theme also has subthemes in order to better describe the nuances of the narratives and insights. The initial positioning of themes, as seen on the previous diagram, was considered too simple to display their hierarchy and interrelatedness. The units of meaning were revisited again as well as the notes from previous stages. More importantly, literature review and the 4TE were also reanalysed. This stage helped the researcher to understand each theme better and to decide the presentation of the themes. Experience process was decided as the highest order in the hierarchy because it is the perception process in which consumers can perceive stimuli and act accordingly. The link therefore should be positioned between the experience process and stimuli. The positioning of the themes and subthemes can be seen in the next figure.
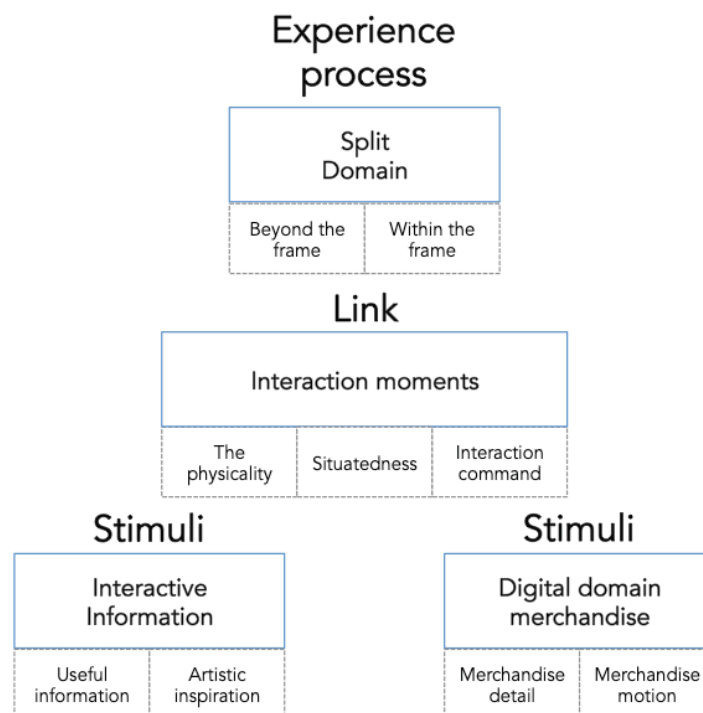

Figure 10. Final positioning of themes and subthemes

3.9 RESEARCH GAPS & METHODOLOGY ALIGNMENT

Interactive technology (IT) in fashion stores is set up by fashion brands not only to gratify consumer demand for digital interaction, but also as a way to communicate interactively and build relationships with them. From a user experience design (UXD) perspective, interactive technologies are deemed to accommodate usability and experiential aspects, as they are both equally essential. This highlights the importance of an experiential quality irrespective of the motivation. A few studies have reported how interactive technology can complement consumers' store experience and subsequently heighten the overall experience. Thus, it points to the importance of employing interactive technology in fashion stores that may enhance the overall store experience. The gaps that emerged from the literature review formed the foundation of the following research questions:

RQ1. What is the interaction experience that consumers elicited from interactive technology in fashion stores?

RQ2. How do consumers interact with interactive technology in fashion stores?

RQ3. In what way does interactive in-store technology heighten the store experience?

The first research question (RQ1) will be about insights into the interaction experience, the experience while interacting with IT that is surrounded by the physical store atmospherics. As such, is not just about the IT itself but also the atmospherics that affect the interaction experience. The answer should cover feelings and thinking. Here the internal mental state is more examined than the actual behaviour; behaviours and actions will be analysed more deeply in RQ2. Immediate expression through protocol analysis coupled with follow-up interviews and observations are considered a suitable strategy to meet the research aims of RQ1. Additionally, an experiment in a lab setting that frames

activities with a mock-up interactive display, provides more detail about their feelings and thinking towards an IT.

Research question two (RQ2) seeks to analyse the actions during user interactions with an IT. As discussed in the literature review, user movements and non-verbal expression are able to reflect the actual inclination towards something. Other than that, what people express and what they actually do may be different. RQ2 attempts to identify those nuances. The data will be gathered through observations, notes and sketches and separately, an experiment in a lab-setting will also be conducted. The tight focus of the examination will generate richer data and provide a more grounded and practical understanding of how people interact with IT.

Research question three (RQ3) explores the "ideal" convergence of experiences for future implementation. This is to gain insight on how best to gratify the expectations associated with efficiency and entertainment as discussed in the literature review, particularly from the user experience design (UXD) perspective. In situ interviews shortly after PA, was used to obtain the data; being in the field and promptly interviewing after an activity evokes immediate evaluative feelings and thinking. Data from PA can also be used to cross-reference the interview data.

3.10 CHAPTER SUMMARY

In this chapter, the methodology that propels the primary research was presented and discussed. A user experience design (UXD) approach serves as the overarching framework. Considering the essence of the phenomenon, interpretivism philosophy was embraced. This worldview helps to implement the strategy of the research that is rapid ethnography, a strategy that is recognised

as well in the UXD field. Still from the UXD stance, three methods were employed for the data collection: protocol analysis, observation and interview.

The data collection consisted of two main studies that are supported by eight data collection activities in the form of smaller studies. Fifty-one participants were successfully involved in the studies over twelve months. The data collection and analysis were undertaken using an iterative process. The analyses went through four stages: observation analysis, transcribing audio data, analysing transcription and themes re-analysis. Particularly in the third stage, the analysis was aided by the four threads of experience framework and; labels from the observation. Throughout the analyses process, reflective evaluations with the research questions were constantly undertaken as well.

Four main themes were generated: split domain, interactive information, digital domain merchandise and interaction moments. As well nine subthemes: within the digital frame, beyond the digital frame, useful information, artistic information, detail, motion, the physicality, situatedness and interaction command. All of these were then positioned in a diagram to display the hierarchy and interrelatedness. What comes next is chapter four: findings and discussion. In this chapter, the themes are elaborated then followed by a discussion with literature and the main framework.

CHAPTER FOUR: FINDINGS & DISCUSSION

4.1 INTRODUCTION

Chapter four presents the findings generated from the primary research that answers the three research questions set in chapter two. The findings presented are only those pertinent to the research questions. This thesis research aims to explore experience with interactive technology in fashion stores. Objectives were also set in order to achieve that aim. In chapter 2, through an extensive literature review, a gap of the research was identified thus three research questions were constructed. These are:

Research question one (RQ1)

What is the interaction experience that consumers elicited from interactive technology in fashion stores?

Research question two (RQ2)

How do consumers interact with interactive technology in fashion stores?

Research question three (RQ3)

In what way does the interactive technology heighten consumers' experience?

The responses/answers to the research questions are presented in the form of themes that conveys the narratives along with direct quotations from the participants involved in this research.

In sum there are four main themes and nine subthemes. The first theme is *Split domain*, and within it there are two subthemes: *beyond the frame* and *within the frame*. The second theme, *Interaction moments*, carries the subthemes of *physicality*, *situatedness* and *command*. Theme number three is *digital merchandise* that has *merchandise detail* and *merchandise motion* as the subthemes. The last theme is *Interactive information*, which has two subthemes: *useful information* and *interactive artistic inspiration*. All this is presented based on the saliency of the main themes, which can be seen in figure 10.
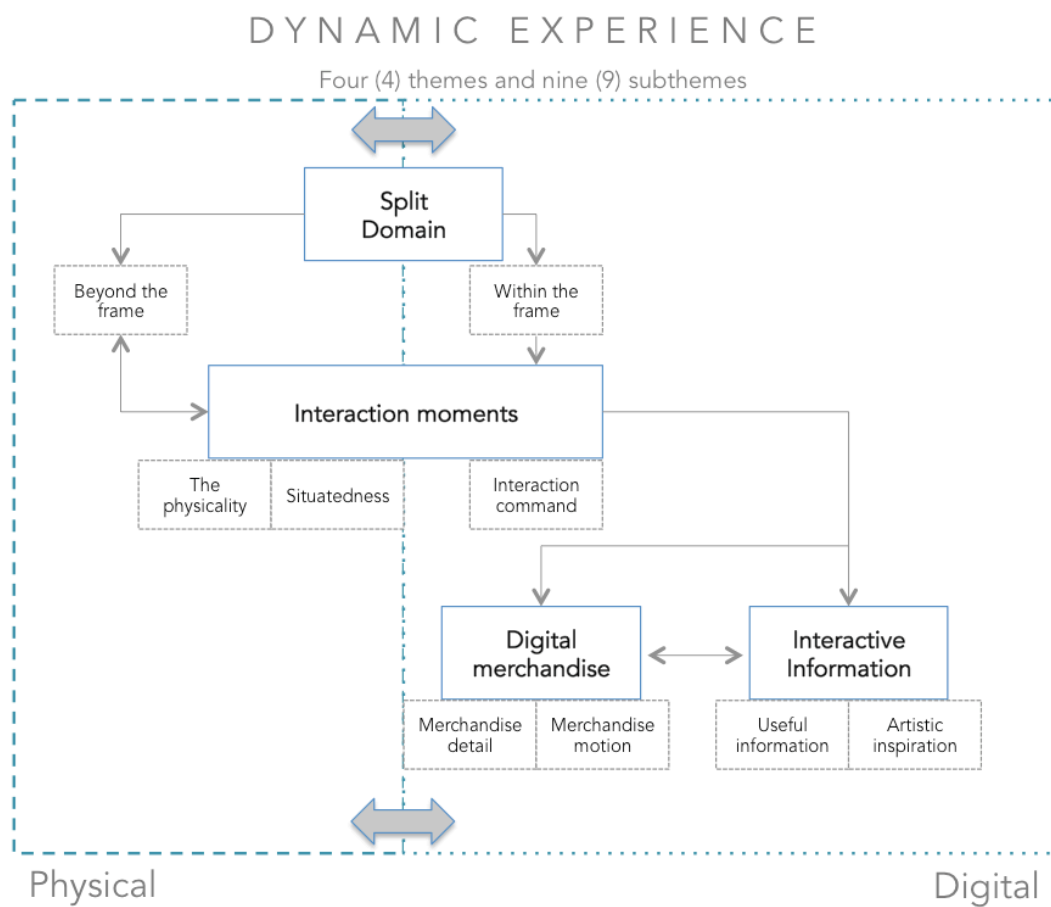

Figure 11. The hierarchy of themes

What follows is the elaboration of the themes and subthemes. They contain descriptions of the themes, evidence from data and insights. Afterwards discussion of the findings with the literature is presented. In this subchapter the core concepts extracted from the findings are discussed with the literature and the main framework from chapter two.

4.2 THEMES ELABORATION

Theme 1 - Split Domain

Figure 12. Theme 1 and its subthemes

The theme *split domain* is about the shifting experience between digital and physical worlds when a user is using interactive in-store technology in fashion stores. The theme focuses strongly on all the visuals that can be seen when a user is using interactive technology (IT) in a fashion store. Other senses such as auditory, tactile and olfactory may be exposed as well during interactions with IT. Nevertheless, the findings of this thesis strongly suggest the primacy of visual stimuli; during interactions with IT a user tends to be very focused only on visual stimuli.

Much literature on atmospherics, which includes visual merchandising, points out the importance of visual in-store design. Ballantine et al. (2015) emphasised layout of objects, merchandise and crowd (surrounding people) influence store visitors the most inside a store. Baker et al. (2002) concluded that store design

can better influence merchandise quality perceptions and patronage intentions compared to music and staff and sales advisors. All this further supports the notion that visual is the strongest perception during interactions with IT. It can be argued therefore that visual related elements are the primary cues or stimulus that should be prioritized in the design, before other elements.

Visual as the strongest sensory stimulus for consumer experience has been proposed by many studies (For instance Spence et al. 2014; Chang et al. 2014; Sachdeva and Goel 2015). This thesis however, takes the visual sense another step further by presenting the notion of the intersection of digital and physical visual elements. When using an IT, the user is able to see the combination of digital and physical visual elements dynamically. Most of the time the user pays more attention to the IT screen to be able to navigate or use it accordingly; and seeks the menu and/or navigational buttons, all of which are digital elements.

What should be underlined is that the user can always swiftly glance around, away from the screen to survey (peer at) the physical store's elements before looking back at the screen. Such movements occur dynamically. During interactions with IT a user's attention is divided between the domains of digital and physical, but this happens very seamlessly leading to a convergence between this division of attention. This is important to be highlighted as it affords the user to be highly aware of the interactions. While they explore the digital domain, a sense of embodiment grounds the user of their presence in the physical domain that is the store. Thus not in the state of flow (escapism) in which people tend to lose their sense of time.

Some notes from the observations further suggest the tendency for people to look around when using an interactive screen. One participant expressed her concerned when a group of people was browsing closely to where she stood. Another exclaimed happily when noticing some graphics on the screen having

similar colours and shapes to the sticker graphics of the store's floor. The physical merchandise that is placed near the IT is also noticed by most of the users.

These findings can be labelled as dynamic because the peak or end experience combines experience knowledge from both digital and physical elements (worlds). The interplay is powerful; the active and shifting process generates new richer experiences. Second, they demonstrate that the process is very active and constantly changing. The findings show that shifting experiences between digital and physical worlds provide an IT user with novel and epistemic feelings. The user would feel that a new thing, which ways for using an interactive object, in a public space has been obtained. Underlying this state is high arousal, which is strongly linked to the condition of being alert and aware. The perception and experiencing process is higher therefore, making it possible to experience the moment better (Kaltcheva and Weitz 2006; Jantzen 2013). In addition, the actions are dynamic because they are unpredictable in terms of the timing of shifting focus. One person for instance, can be very active in looking around when using IT, while another looked around only at times. But evidently, this shifting focus always happens during interactions.

Most participants involved in this research indicate the dynamic switching of perceptions between the digital and physical elements (worlds) inside Niketown and Levi's stores.

> "… The visuals are really really good, a sort of modern umm hi tech style with [glancing away from the screen towards an area] oh they wanted to make similar style I think with the surrounding…" (P23, Niketown)

> "… I'm gonna choose this one [a design logo for the tshirt] and then…which colour [thinking]… well this one looks like, I saw one that looks like this over there [pointing at shirts and t-shirts rail]. Can I go there just to check? …" (P44, Levi's)

Dynamic domain experience can also be seen from IT users' physical presence. A few sketches from the observation show the likelihood of the dynamic experience from the way they stood or positioned themselves. Rather than fully facing towards the screen many users tended to stand a little skewed about 35 degrees either left of right. This body posture seems to be the convenient position when interacting with IT. In that position people would be able to use and/or navigate the screen while aware of what is happening surround.
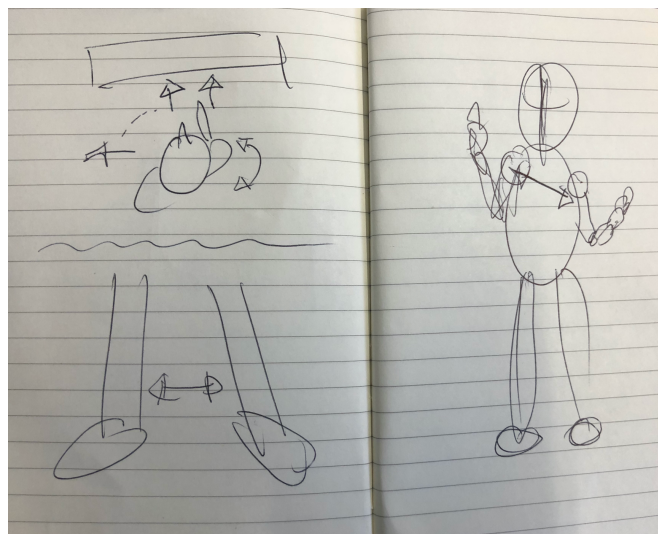
Sketch 1. Users' position when using IT

In order to elaborate the nuances of the theme "dynamic domain", two additional subthemes were created: *within the frame* and *beyond the frame*. The first covers all elements on IT screen that is digital domain, while the other covers all the physical store's elements, the physical domain.

Within the frame (digital domain)

This subtheme represents everything a user can experience on IT screen. As mentioned before, when experiencing an interactive screen in a fashion store a user can always switch their experience between the domains of digital to

physical. The theme within the frame focuses only during the moment of the digital experience, that is when the attention and focus are on the IT.

In general the users of IT view the screen as a whole and in detail. Similar to interactions with personal devices, such as the smartphone, people tend to see the screens as one visual. However, when navigating the system through tap and swipe, their attention instantly go to the smaller elements of the digital graphics, for example menu buttons, texts, and navigational graphics. Further, they would immediately start noticing the details of the content. Graphics, especially menus and navigation tools, were perceived quickly. At this point, the visuals as a whole were positioned at the "back side" of the attention (Tuch et al. 2009; Wang et al. 2014). Knowing that the screen is interactive seemed to be the chief reason for those quick observations.

One finding however indicates that navigation graphics are not always the "small" important elements. These can be the elements that form the overall frame of a screen, such as background graphics, texts, images and decorative elements. Although these graphics do not have a particular interactive function (ie, navigation tools), they have a function as supporting elements that help interactions, for example for making the visuals clearer, highlighting a product and reducing information overload.

One instance was recorded from the observations that have been confirmed with the brief interview; IT in Levi's store contains a border background separating the main content from options for custom logos as shown in the figure below. Without the black background some users found it difficult to immediately notice the function of the options or the possibility to choose a logo for the t-shirt.

Image 12. IT in Levi's London

As such, graphics that attract the user are not always navigational tools. The user also pays attention to small things that compose the overall digital content and accentuate it. The core idea of this finding can be seen also from the POI excerpts below.

"…right now I can see a menu where, you know, I can see some graphic thing, oh it's a headline, Nike plus run club…" (P28, Niketown)

"…these graphics are pushing the product out, very tribal (style of graphic) and strong. So even it's just a t shirt it became bold…" (P43, Levi's)

This finding is aligned with Khakimdjanova and Park's (2005) study of online visual merchandising. One of the earliest studies on the topic, their study drew closely from Kerfoot et al.'s (2003) behavioural process model on the effect of visual merchandising on people's psychological state and behavioural intentions. Khakimdjanova and Park (2005) conclude that each graphic element on an online platform is important and has its own specific function. For example, one needs to think about and evaluate the background and/or surrounding colour that suits an image of a model wearing white outfit.

It should be underlined however that studies of online atmospherics or online visual merchandising often provide a landscape to see the close relationship between elements of physical visual merchandising and digital visual merchandising, and further, how those elements can affect people's behaviour. These findings of this thesis suggest a more specific insights into the function of graphics, that is how the small digital elements can help increase the fluency and enjoyment during interactions. The users can see things more clearly and feel "guided" throughout the interactions.

Another finding is about the simplicity of the screen content layout. Users of IT tend to like a "flat" design layout better. It refers to the application of only solid colours for the graphics and top view angle style image. This flat design layout can be seen clearly in the Levi's IT as shown in the figure 13 below.

Image 13. IT screen in Levi's London

Such a layout application could not be clearly seen in the Niketown IT. But the researcher noted that some navigation graphics and decorative elements are using the flat design style. Some users' excerpts from the two main studies also reflect this.

"… The visuals (graphics) are great, rare design. Overlapping but simple [flat buttons], makes me interested to go (use/interact) further…" (P42, Niketown)

"… the content [system] is very clear, simple, it's like putting everything flat on a table…" (P11, Levi's)

The findings in *within the digital frame* subtheme covers three points: concern about how an IT user can see digital elements as a whole and in detail, the importance of maximizing small decorative graphics, and simplicity of a two dimensional (2D) "flat" design layout. What comes next is a subtheme displaying narratives and insights about experiencing the physical stores' atmospherics.

Beyond the frame (physical domain)

The theme beyond the frame refers to the physical domain's elements or atmospherics that people experience during interactions with IT. Given the location of the IT, which is inside a fashion store, naturally the IT user can also perceive and experience every other aspect outside the screen as far as they can see. The physical elements such as rails of merchandise nearby, stickers on the floor, lightings, among others. All of these are physical domain elements represented by the subtheme *beyond the frame.*

Studies covering interactive technologies in public space have noted that the technologies can affect the users positively. However those studies did not account for the surroundings that can also influence the interactions. For example research by Dennis et al (2014) investigated the effect of digital screens on evoked experience. These screens are able to evoke people's positive affect namely feelings of being happy, satisfied and stimulated (Dennis et al 2010). Also, being immersed in a store equipped with digital screens can increase the possibility to spend more time and purchase (Dennis et al 2012). Another study

indicates that a magic mirror interactive screen can influence positive perceptions of store atmospherics and patronage intentions (Poncin and Ben Mimoun 2014). What can be taken from these studies is that how the look of an interactive technology can influence the user. But it focused only on the technology (device), where in fact many user experience studies have suggested that the surrounding elements should also be considered (for example Muller et al. 2012; Akpan et al. 2013). These surrounding elements are the physical atmospherics present in the store in which the interactive technology is installed.

This research extends these previous studies' findings. Although users can be engrossed with the content of the IT, they can also link the physical atmospherics nearby with the content. Meaning what is presented in the vicinity of the IT is paramount. Decorative elements and other surroundings can increase the quality of the content as well as underline an important message in the content. These can be seen in the excerpts below.

> *"… Everything is perfect. The height, maybe because I'm tall. The size, and the rim is metallic black, blended with the wall, suit the others [physical atmospherics] really well. It's cool and hi tech…" (P50, Niketown)*

> *"…It's good to match the ambience with the design [IT content design] so people can connect with the promotion…" (P12, Levi's)*

> *"…I click this [tapping a t-shirt visual button]… then I am finding the perfect logo [graphic style]. It's the pride identity [a rainbow visual] just like the things decorating the [physical] store…" (P38, Levi's)*

IT installation or location varies. Observation notes demonstrate that IT can be found in the middle of a store, or several corners of a store or even in a special dedicated location. Moreover, it appears that the closest/nearby physical atmospherics affects the user experience more strongly. Users may see objects

that are located farther away, but when shifting between experiences, they usually perceive only the closest surroundings.

One key point from this subtheme *beyond the frame* is that the elements surrounding IT are perceived by users, enabling them to make connections. This should mean that while a store can have areas with different design, the IT areas are expected to support the content of the IT. What follows next is the main theme 2, concerns a specific element of the digital content of IT.
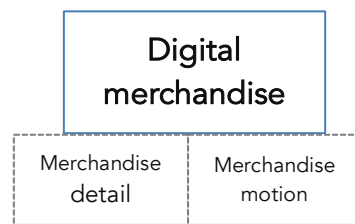
Theme 2 - Digital Merchandise

Figure 13. Theme 2 and subthemes

Digital merchandise is the second of the four themes. It represents findings associated specifically about the presentation of the digital merchandise of a brand in which the IT is installed. The subtheme *within the frame* previously described covers all the digital content, but it is more about experiencing an IT screen along with its digital content detail as a whole. This includes main visuals (images, films) and decorative graphics. Moreover, graphics for navigation were usually seen as part of the total content. The findings show that users pay most attention to the merchandise. Thus while it is part of the content of the IT, elements of merchandise should be delineated and presented separately as a main theme. The theme *digital domain merchandise* is more specifically about the merchandise presented on IT both those for e-commerce/selling purposes or demonstration.

It is important to underline how digital merchandise does not always straight away attract the attention of IT users. Notes from the observations show that the first stage when using IT is immediately looking at the screen as a whole. Further, most participants tended to discern the detail of the functionality, such as menu buttons or other navigation tools. But then, what goes next is the exposure of the merchandise on the IT. This process however is not absolute not an awareness sequence. Although it is not the detail content a user would first see. It is the "digital object" that a user seeks.

Merchandise presented in IT can attract a user to further engage with the IT. Moreover, it aids the evaluation process and in turn the decision-making process. The presentation of digital merchandise on IT is therefore paramount.

> *"… I'm swiping [using the swipe navigation], the design is a bit dark…oh this is nice [stopping and looking at a shoe on one large window menu]…" (P25, Niketown)*

> *"…hmm let's see [keep scrolling options of images] arrhh I'm confused [with the logo options] maybe I can find the one that looks like this [stopping and looking at a floating logo design]. Let's see where it is…" (P46, Levi's)*

Studies about online merchandise and online atmospherics that have been discussed in the literature review suggest similar conclusions. For example studies by Ha, Kwon and Lennon (2007); and Kim and Lenon (2010) argue that the manner of product presentation on websites can maintain engagement and help consumers to decide. Merchandise on IT, either demonstrated or positioned as e-commerce, is highly important and therefore increases the value of the IT. It is one of the main reasons why store visitors wanted to use IT in the first place.

What is different from what has been suggested in previous studies, is that highlighting only a few main items of merchandise can attract the users' attention more. While they are engaged in the navigation and expose with graphics as well

as images, they seemed to be expecting that only the best ones would be presented to them. The findings of this thesis show that merchandise experienced on IT is a prominent aspect of the digital content in IT. But the key point is that users expected to be provided with less options of merchandise. Although they prefer to be more active in exploring IT content, too much merchandise presentation can make them feel "pushed" or exposed by advertising. Further findings in relation to digital merchandise were found. In order to describe them in more detail, two subthemes were created: *merchandise details* and *merchandise motion*.

Digital merchandise details

This subtheme covers the theme merchandise further by going into more details. It is important to account for the details of digital merchandise on interactive screens. Another finding shows that users of IT want to see the smallest elements, such as contour and fabric pattern. This could be presented in two ways. One, is by providing a magnifying tool. Another is by presenting images of the already magnified details. The latter can have limitations. The images may not be sufficient to show what was expected for instance, but they could be valuable as some users may have less motivation to move around the zoom tool.

> "…you can see the detail of the shoe here… very detailed, as if it's the real texture [referring to a zoomed image of a shoe fabric]…"(P11, Niketown)

> "…Just trying to find which one [tapping left and right product navigation]. I wanted to see the logo bigger [using the zoom tool]…"(P38, Levi's)

One early study about websites' product presentation finds that a zoom tool that affords users to see merchandise details can reduce perceived risk and influence intention to buy (Park, Lemon and Steel 2005). Using interactive screens in-store cannot be compared to using a website. Given their location, it is evident that

users can easily see the real merchandise directly. While this is true, a good presentation of digital merchandise detail can complement what is already available in-store. Store visitors do not always feel comfortable in touching and scrutinizing physical merchandise, they could also feel reluctant. Staff can approach them to offer help as a result of such an activity, when in fact they do not want to be disturbed. Providing possibilities to scrutinize merchandise digitally for visitors therefore can help sort this problem of being disturbed.

Despite the expectation to digitally scrutinize merchandise digitally, one interesting finding indicates that the users need to be provided with specific information of merchandise. It is true that the users prefer to be active in searching for details (of merchandise), but some unthinkable aspects of the merchandise need to be provided for them. One example is digital merchandise, where users prefer to be provided with less exposure (of images) so they could explore more, but when it comes to the detail of merchandise that they are looking at, the users expect to be provided with important images for example zoomed texture. The next subtheme is somewhat similar to *digital merchandise details.* However it concerns the possibility merchandise in motion for exploring its details.

Digital merchandise motion

The subtheme *digital merchandise motion* is more about how an item or product can be moved on the IT screen. In general the merchandise motion is in the form of three dimensional (3D) presentations or short videos, which enable an IT user to see and evaluate the details of a particular product or item as the one in Niketown. But it can also be in the form of two dimensional (2D) presentation like in Levi's. Previous studies conclude that the former (3D) is more common to find

and more effective in influencing consumers positively (Khakimdjanova and Park 2005; Kim et al. 2007; Yu et al. 2015).

Motion takes two forms. First, motion as in playing automatically, such as videos and embedded animation (Katrandijev and Velinov 2014). This type is appropriate to use on the main screen or menu to attract users to engage further. Ordinarily, websites' homepages would have this animation playing automatically the moment the page is loaded. What is displayed on the homepage is normally the main content, such as new products and offers. Users can then click on it directly without having to go through other menus. In general IT screens treat each sliding menu or page as the main content a shortcut to the actual menu. One reason is because the menus are lesser (more simple and less buttons) compare to websites. Thus, merchandise motion can be presented on each menu. This is similar to the merchandise motion type on the Niketown IT.

The second type of motion for merchandise is the zoom or moving tool (Yu et al. 2015). Users will be given a cue that the visual can be controlled. Such a tool affords users to feel more in control of the content (Fasolo, Misuraca and McClelland 2006). Users enter the domain of interactivity with this type of motion. They would act according to their contextual objectives. Moreover, familiarity may be achieved given the intuitive gesture that is similar to personal devices. This type of motion can be found on both ITs, in Niketown and Levi's.

An important thing to point out is that the users participating in this research tend to like the automatic motion better than the "manual" one. This is because the users can at times overlooked some important functions of navigational tools, especially the some tool. Automatic motion affords users to experience the details of merchandise without having to touch it. Similar to what has been previously described in *digital merchandise detail*, the users prefer to be provided with automatic motion showing details. This is in contrast to what has been indicated in previous studies. It is also interesting to find how the users

want to be active when it comes to interactions with IT, yet in some aspects they still expect to be provided with selected and relevant images. These excerpts show this underlying idea.

> *"… I think the slow mo(tion) [autoplay video] is fantastic… because it's very smooth and not clanky…"(P38, Niketown)*

> *"…I'm zooming this [shoe]…right, I can also rotate it. This is good so I can see every angle [seem struggling with the rotating tool], whoops how to do this? Sorry a bit stuck here…" (P17, Niketown)*

Early studies concerning e-commerce websites have underlined the importance of non-static images or merchandise (Fang and Salvendy 2003; Chittaro and Ranoon 2002; Miller 2005). A decade after these studies were published, motion graphics and merchandise motion have already been used much by fashion websites. It functions chiefly to display digital merchandise in detail equivalent to the real one. This way sensory experiences can be elevated (Miller 2005), adding experiential values (Jeong et al. 2009). Moreover, studies on fashion websites note that during the moment of engagement, users generally zoom in or make the visual larger to see its details shortly after their attention were drawn to the targeted merchandise (Park et al. 2008; Jeong et al. 2009).

Digital domain merchandise along with its subthemes *digital merchandise detail* and *digital merchandise motion*, demonstrate the importance of planning and designing them well. It is more about treatment and not quantity, so that rather than presenting many product images, it is more useful to plan the format of the presentation itself. As discussed earlier this includes but not limited to photo quality (can be zoomed), angle, positioning (can be rotated).

The important point from this theme is that IT users tend to like active interactions, with which they are able to explore IT content in their own time and according to their needs. Nevertheless, when it comes to the details of

merchandise, especially specific merchandise they are focusing on, the users expect to be presented with an important selection of details, such as an image of a zoomed fabric or an autoplay motion graphic or video. The theme introduced in the next section is more about the content of IT and information that can be experienced interactively.

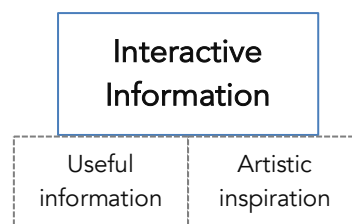## Theme 3 - Interactive Information

Figure 14. Theme 3 and subthemes

Theme three contains narratives of findings regarding interactive information perceieved by the IT users. An interesting finding shows that most users perceived the information on IT as interactive irrespective of the function. This should mean that the perceive interactivity on IT content tends to be higher. Studies on digital content put forward that often only menu (navigation tools) and product images that are perceived as interactive (Wu 2005; Wu and Wu 2006; Yo et al. 2015; Sundar et al. 2016). This finding suggests something further; that all content on IT is perceived as interactive, including text and images that are not interactive (cannot be clicked). This can be seen in the following excerpts.

> *"… then I go into this page, yes it's accessible [keep swiping and clicking] this one is… wait…yes I can click it, so everything is… working [clickable]…" (P41, Niketown)*

> *"… quite easy…less info on this one. Well it's simple, not much info but very interactive, do you know I mean?…" (P12, Levi's)*

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The condition of IT in both stores appears to shape the way the users perceive its content. It seems that knowing that it is in fact an interactive technology leads to the perception that everything is also interactive. This is interesting to note as the IT content system is actually similar to any other content systems of websites and applications on technological devices. That is some content is not interactive or cannot be clicked. For instance, the body copy of a website's homepage or a background graphic of a mobile app. One possible reason of the high perceived interactivity of IT content is because the users rarely use IT unlike using personal devices. It can be argued therefore that there is a strong link between the condition of IT being interactive and installed in a store and the perceived interactivity of the content. More details regarding *interactive information* are delivered separately via the next two subthemes.

Interactive Useful Information

This subtheme is about all useful information experienced interactively from interactive technology (IT) in fashion stores. Information about product or merchandise and other brand related information, can be found inside a store. This information can be found on IT as well, in which case it can be called interactive useful information (IUI). Similar to information that permeates the physical store, interactive useful information which is digital, in general covers promotions or offers, merchandise detail and similar functions. As such it is more attribute driven, information that can increase conviction towards particular merchandise and/or a brand.

IUI mostly takes the form of texts: headline, subtext and copy. IUI as texts is embedded in the design of the graphics, meaning it also has visual appeal. IUI can also be visuals, typically a visual showing and informing something, for instance a new type of shoe fabric. The texts would then enhance the clarity of

the message. Texts, therefore, are the dominant format for interactive useful information.

It is likely that a user will be presented with such information during interactions with an interactive screen. In general, it will show up immediately on the screen after the first tap or click. A user would therefore accordingly perceive and react towards it. What can be underlined, is how often people feel that they get benefits from this type of information and hence regard it as useful. A number of studies have stated a similar concept. For example, O'Cass (2000) proposes that advertising messages invite consumer involvement that can lead to positive decision-making and in turn purchase intention.

One finding in this research demonstrates that IT can provide useful information. But more importantly, the interactions made the users think that the useful information is "pulled", so not exposed by the system. It further suggests that the users can obtain useful information more efficiently as they would perceive that they are just experiencing only the most important and relevant information. Moreover, they feel in control, the information is filtered, without having to be exposed by the unimportant information. These next quotations show this.

> *"… So what I'm seeing here is a new product I think with some innovative technology. It (the headline) says it is (the shoe) lighter and with higher breathability. Right that's cool because I'm into it, glad to know it…" (P13, Niketown)*

> *"… Ok so let's see, how's the fit [of a customized t-shirt]? Ok, regular [getting the information] Great to know because here [images] it looks a little boxy…" (P33, Levi's)*

The key highlight from *interactive useful information* is that some of the information on interactive screens can be selected. A user can find and "pull" the only information they really need via a few taps. Given the interactive characteristic of the information a user can thus navigate accordingly to obtain the required information. This can mitigate the notion of information overload, a

condition in which people feel they are getting too much information and too many choices. As a result of information overload, consumers may feel exhausted and might affect them in a negative way (Iyengar and Lepper 2000; Vohs et al. 2018).

Another finding shows that although a user can explore IUI, it does not mean that all information should be placed on the IT. Only the information that is strongly relevant and adds more benefits should be prepared or provided. A physical store should already present general information, such as category of merchandise, products and prices through point of sale and in-store signage. IUI should cover elements of information that are rarely shown in a physical store, for instance a brief story behind a particular design or descriptions of secondary merchandise worn by a model, as demonstrated by these next excerpts.

> *"… I wanna find another colour. Custom maybe? yeah I think fabric composition is not really important, I mean you can always pick it up there [pointing at rail of merchandise] and see the label…" (P22, Niketown)*

> *"…they should've shown the detail of all that [a top worn by a model]…" (P51, Niketown)*

> *"… [reading one image's description] this one is related with the pride campaign apparently. Maybe they should tell more?…" (P17, Levi's)*

It needs to be emphasized that a user is unable to change the visual design and the text of the information, but she/he can decide which one to read. Therefore, it is interactive, meaning users can control which information to experience. It can be argued that this possibility can increase the interaction experience intensity of an IT user. Next, is a subtheme that is also about interactive information but more about the how it can give inspirations rather than aiding purchase decision or utilitarian information.

Interactive Artistic Inspiration

This theme refers to all artistic driven information on interactive technology (IT) in fashion stores that is experienced interactively by users from which can inspire them. In essence, the concept artistic refers to the vivid elements of a visual object that are determined to increase the visual sense enjoyment (Balkema and Slager 2004). Furthermore, the artistic aspects of an object aim to affect the behavioural responses of those who see it (Hofstede et al. 2007; Eldesouky et al. 2015). This is in contrast with the concept of *aesthetic* to which the perceiver of an aesthetic object is not expected to response (Vyncke 2002). For this reason, the concept artistic was considered to be more suitable to be used as part of the name for representing this subtheme.

While interactive useful information leans more towards attribute and/functional driven information, which aid decision-making processes, interactive artistic inspiration (IAI) refers to the enjoyment side of information. The result of such information does not necessarily lead to a positive brand image, or purchase intention for that matter. IAI should inform personal satisfaction and satisfy the users' intrinsic values.

> *"…[swiping the screen, laughing] quirky logos. Oh look this one's cute [pointing at a Levi's logo element with London landmarks silhoutte on top]. London landmarks aren't they…"*
> *(P35, Levi's)*

> *"… Gorgeous photography…" (P24, Niketown)*

Similar to interactive useful information, interactive artistic inspiration can be experienced from texts and visuals. The latter, however, seems more profound in conveying inspiration for a user. Texts, through well-crafted copywriting and choice of font, can provide inspiration. But visuals, still or moving can enable inspirational messages to be perceived and experienced more immediately. One reason is because people tend to understand visual images far more quickly, without having to pass through elaborate cognitive processing (Lankow et al.

2012). Thus, it can be argued that artistic inspiration mostly takes the form of visuals, such as the main image on the home screen of interactive in-store technology, responsive navigational graphics and short film/video. An IT user can pull some IAI according to their needs and wants by navigating the installed menus, similar to *interactive useful information*. During navigation, a user may experience simple graphic animation. How it is received however, is slightly different. People tend to find information (IUI) that is useful for them purposefully. This is not always the case with interactive artistic inspiration. At times a user would receive the message coincidentally and/or in an unexpected moment.

> *"…The video is playing now. [brief silence] wow it's amazing, I mean, it's only an advert but (it) looks like a movie trailer. You know, I think they really think about everything (quality of the film), always taking things seriously…" (P29, Niketown).*

As many inspiring messages are able to do, artistic inspiration (AI) affects positive emotions and further fuels one's knowledge with inspirations or ideas. IAI can quickly increase aesthetic satisfaction. One dimension from Mathwick et al.'s (2001) model indicates that visual appeal and entertainment can create a positive aesthetic experiential value. Similarly, aesthetic experience can be achieved from background image, colour and style co-ordination (Cheung and Vazquez 2015). This should also mean that *interactive artistic inspiration* can be positioned conveniently as a contributor to store atmospherics and digital atmospherics, as it contributes visual appeal to the overall visual in sight in-store.

One aspect that should be underlined from this finding is the content's capability to provide clearer nuances of aesthetic experiences. The core of the messages from IAI evokes not only reactive aesthetic experiences, but also intentions to channel the knowledge received into something practical. In this case users seemed to receive ideas for how best to renew your style or outfit and would apply it for themselves. The messages experienced from IAI are able to spark

ideas for constructing personal style and further self-identity and self-presentation as seen in the excerpts below.

> "… I don't like this top but the leggings looks fab. Might try to look for this. If anything I can mix it with mine…" (P1, Niketown)

> "…I don't normally do white tee (wearing a white t-shirt), just too flat. But this design (a custom Levi's logo) brightens it up. Would be great on oversized (style) tee…" (P21, Levi's)

Another finding regarding *interactive artistic inspiration*, is that human aspects in IT content can provide inspirations for the users as well. All models (wearing the brand's outfits) presented on the IT screen can be regarded as aspects related to humans. A finding shows how human elements are an important aspect when experiencing the information. Graphics, visuals and texts can be quite sterile/cold and too hi-tech. To have human aspects as part of the content not only can inspire the users but also can make the ambient warmer. Some strong reasons are relevance (users can relate with another human) and actions/poses from everyday activities, such as running and doing sports.

> "…it may be very cool with the colours and all that. But the people [models] make it down to earth…" (P5, Niketown)

> "…too bad I can't really see the cut [of the t-shirt]. I don't like slim fit style. Well maybe I can always see it here somewhere. But they could've shown it [t-shirt] on someone [a model]…" (P36, Levi's)

Extending the human aspects of IAI, the next finding shows that IT users prefer models that are not known. The use of prominent people such as a celebrity sports person like *Cristiano Ronaldo* does not always work. It seems that the users appreciate models that are prominent or unknown because they can relate better. For the users, models that are unknown or not prominent (not celebrity) seem more appealing. Using a celebrity model can be aspirational. But it appears

that the users can relate better with the former. One possible reason for the higher relevance with unknown models is because the image or promise offered in the visual (of an advertisement or content) feels more attainable. Somehow users could even see themselves as part of the brand. This can be seen in some of the excerpts below.

> *"… normal people again, well you could see Ronaldo before, but most [models] are just like us…" (P27, Niketown)*

> *"… Nike is one of the brands that have been using like regular people [not a public figure] for their adverts [the participant also referred the screen as advert]…" (P47, Niketown)*

The key points from the theme are, first, information in IT is regarded highly interactive and thus the users are in control. However, it should be carefully planned and implemented. Second, the information is expected to offer something more or different from what can be found inside the physical store. It can also spark some practical inspiration for the users. Third, the use of human aspects in the form of "normal people" model can help the users relate better with the IT content. What is presented next is a theme that links all themes together and is also a key finding in this research thesis. It is named *interaction moments*.

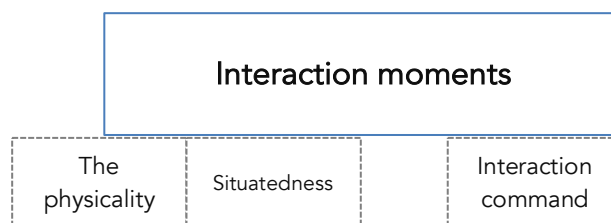## Theme 4 - Interaction moments

Figure 15. Theme 4 and subthemes

The theme *interaction moments* covers all aspects linked to the interactive process during engagement with interactive technology (IT) in fashion stores. This includes visible interactivity actions and perceptions or thinking processes on interactivity that occur internally, an internal state/mind. Interactivity is at the heart of this theme and it is evident that interactivity is a trait that differentiates IT from other in-store technologies (non-interactive), such as digital signage. IT enables store visitors to experience additional content and actively engage with its elements similar to interactions with personal devices. Interactivity is the most distinctive aspect of IT that takes it into another level. In this theme, what is discussed is how interactivity is one trait that provides several benefits for store visitors, all of which can help elevate the overall store experience. Its characteristics allow store visitors to obtain new experiences.

To start with, the interactivity of IT can gratify the store visitors' expectation for digital interactions. As explained in the rationale of this research, people are becoming more digitally confident thus tend to expect digital interactions (Koo 2016; Mintel 2018). This is one of the reasons why people often use their personal devices, such as the smartphones, during a store visit. It should be noted however that the interactions are not always brand or purchase related. The interaction activity itself is fundamental gratifier, through holding a device, using it and being connected (Koo 2016).

One important finding indicates that IT via its interactivity was able to gratify users beyond the usual personal devices interactions. New and unexpected content, which is related to epistemic experience for knowledge (Jantzen 2013), is the driver. Although personal devices enable people to access various information and content via the Internet, at times people expect information and content that is already provided. The IT content is surely interactive as discussed previously (*interactive useful information* and *interactive artistic inspiration*). But because IT content is provided by the brand and normally disconnected from the

Internet, the access is rather restrictive. The user is not able to access another information freely.

This limited interactivity access can heighten the attractiveness of IT and therefore intrigue the users to engage further. The elements of surprise, such as knowing that the content and the way to use it are set, lead to the perception of new experience. This is reflected in some of the responses below.

> "…quite interesting. This can be refreshing [using IT] because I don't think you can't get it from your phone…" (P3, Niketown)

> "…It's like escaping. I used mine [a personal device] to distract myself. So if you can see and you know try new things, it would add up my experience…" (P12, Levi's)

> "…I never used this kind of screen before. It's great to use it. I can do things [tapping the IT screen around]…you can also get more info here I imagine. Basically a tool that is useful…" (P36, Levi's)

Many studies have indicated how using personal devices can gratify people's needs (Such as Park et al. 2009; Kim et al. 2016). The interactions provide values that enrich people' activities (Wang et al. 2013). This finding highlights another important aspect about digital interaction. That is, how IT as a public technology can provide the element of new experience via its content and navigation activity. The unpredicted content and navigation tools can increase the value of the IT itself. For one, because the users' curiosity becomes more intense; experiencing something new mentally and physically make the interactions more engaging.

In order to present the richness of narratives of the findings regarding interactivity, three subthemes were created. These are *the physicality, situatedness* and *interactive command*. What follows is the elaboration of those subthemes.

The physicality

This subtheme concerns how the physicality of IT has a strong interplay the interaction moments. IT's physicality can help communicate its interactivity, intrigue store visitors to approach and use it; and make the interactions more convenient by making the user feel more comfortable.

The physicality of IT was able to convey its capacity to be interactive to store visitors. This happens when people perceive and immediately assume an object to be interactive or not, and what that object can do. IT's physicality can convey higher perceived interactivity; people would be able to perceive that it is actually a device that can be used. One finding shows that connections with daily habits and/or activities help form preconceptions towards objects or devices. People can relate interactive objects they used in their daily lives with IT. Thus the perception of the interactivity of IT tends to be clearer and higher. For example, smaller size IT in a vertical position can lead to higher perceived interactivity as store visitors can easily relate it to tablets, such as an iPad.

Other data shows how a user in the Niketown study associated the horizontal 48" interactive screen to a television. A user in the Levi's study easily related the interactive screen to his mobile phone. The two examples are based on the participants' frame of reference on screen orientation. The screens of IT are most likely fixed, meaning cannot be rotated, while using personal devices can be more flexible. One can always adjust the screen orientation according to the activity. For instance, using a mobile phone vertically when texting but horizontally while watching Netflix. Despite this, general perception shows that people would connect what they have with what they see. Further, this implies the similarity between interactions with personal devices and interactive screens. This can also be seen in the excerpt below.

"… As I said I knew that this was touchable (interactive). You can use it for something. Kinda look like it already…" (P27, Niketown)

"…of course because it on a standee like when you see someone using an iPad in a café. Well, a little bit bigger though…"(P19, Levi's)

IT Size, orientation, shape, are important and have to be accounted for as it can convey the interactivity trait of IT. Moreover, IT's physicality can intrigue people to approach and finally used it. Previous studies indicate that people can be reluctant to use an interactive object because they did not know that it is interactive, even if they knew the look can either be inviting or intimidating (Muller et al. 2011; 2012).

When store visitors were inside a fashion store and noticed the IT, the perception and evaluation of the IT might take some time. For instance, in one case a participant had seen the IT but he kept walking while still looking at it. He finally stopped and made a turn approaching it, but again stopping in front of the IT, leaving a considerable gap before finally moving forward and touching the screen. A sketch from observations captures this movement.
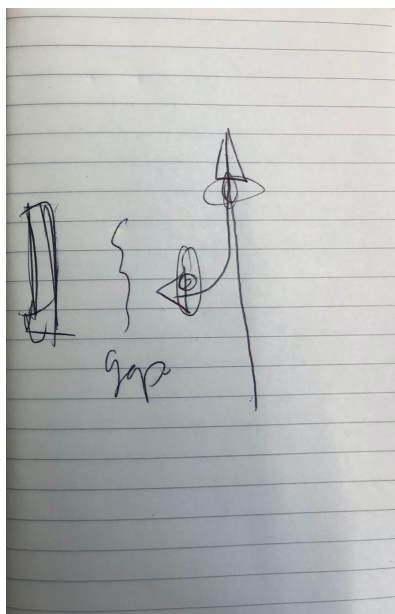
Sketch 2. A user's walk path when noticing IT

Large screen ITs are not uncommon in flagship fashion stores. As noted from the brief interviews after the protocol analysis, an IT screen could be categorised as large when the users needed to move left or right and/or reached further to navigate. Large screen ITs enhance the overall look of stores; given the size and prone to exposures. Notes from observations show that nearly all flagship stores in the central London area utilise large screens for advertising and in-store information. The latter is more about recent offers and area signs (area identifications). Underlined from these notes, the majority are non-interactive screens, meaning the function is merely to display content. That is probably the reason why people see but do not approach and use them. Large screens are identic as non-interactive screen and digital signage. This means they are not really something to consider further. Notes from observations in Niketown London show that many participants passed some large screens without even evaluating them.

IT with small-medium screens appear more effective in intriguing users. They would instantly regard the screens as interactive. Notes from interviews indicate that an IT screen is in the small-medium bracket when the interaction movements are reachable. This means users do not need to move and reach much during interactions, which happens when using large screens IT. Many other factors should be considered when categorizing screen sizes; for one, body and object comparison. However notes from observations and interviews suggest that those responses seem sufficient for this research. Moreover, detailed screen categories are beyond the scope of this research.

Based on brief interviews and observations, it can be proposed that the size range of the small-medium screens is between 11 inch to 54 inch. This is the range size that can be seen on interactive devices in our in day-to-day activities and at home, such as computers, Smart TVs and an iPad. Association to personal devices that are interactive is established therefore with small-medium size screens. It partly answers why the small-medium IT is more effective in

communicating the interactivity of IT. Such an association seems able to increase the possibility of approach-interaction because potential users can understand that the IT is in fact interactive. How the small medium size IT can increase the findability of IT and communicating its interactivity can be seen in the excerpts below.

> "… You know because it (the IT) looks like a TV set or at least, you know, something that can show something and I feel quite familiar. I'm more interested and not afraid to use it…" (P17, Niketown)

> "…There it is. That's the tech (IT) isn't it?… I just thought because of the look and how it's placed…" (P40, Levi's)

The awareness of the interaction with the "public technology" is generally not too high. As a result the attention tends to be relatively low. User experience design literature suggests that people are not inclined to allocate their attention fully to a public technology given the unfamiliarity (Akpan et al. 2013). Moreover, normally people tend to have a lower expectation about the content of such a technology (Muller et al. 2009).

Correlated with the above, it is important to highlight that the physicality of IT can make IT users feel more confident and familiar in using it. Not only because they feel a strong relevance with personal devices, but also it helps make a more convenient situation. Small-medium size screens IT can make users feel more comfortable because the navigation and/interaction processes are reachable.

One finding reveals that users may not feel comfortable if the IT screen can be seen clearly by others. Many users said although they are confident in using the IT, they prefer not to be "exposed", just like when using personal devices, people tend to be discreet with the devices. At times users also want to be seen when using IT, but not really being in the spotlight. With small-medium size IT

users think they can always cover the screen somehow with their body. Again, they feel in control in balancing showing and being discreet, as reflected in one excerpt below.

> *"… It's ok to navigate. It's like a slightly bigger iPad. So you see I can reach like this [showing tapping a higher located button] easily. It's not that big so if I did something wrong nobody knows [laughing]…" (P6, Levi's)*

To restate the important points from this finding, the physicality of IT can help convey its interactivity thus intriguing potential users. This is because store visitors tend relate digital devices to their own preconceptions. IT that resembles a personal/home device, for example, can intrigue more potential users. Another is that the physicality of IT can also make the users feel more confident in using it, because they can feel more familiar with the "new" device by relating it to other interactive devices they have experienced in day to day activities. Next, is a subtheme that is strongly linked with *interaction moments*. It concerns the surrounding of the interactive in-store technology, and is named *situatedness*.
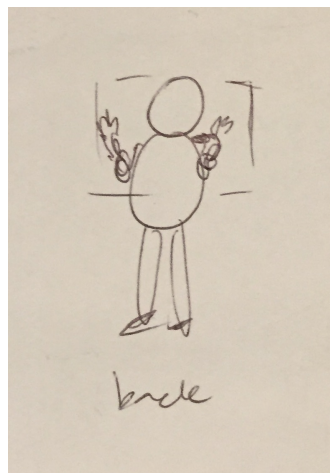
Situatedness

This subtheme presents some findings' narratives associated to the situation and condition within the IT area. The situatedness of IT can affect the interaction moments, in essence it is basically about how IT is located inside the store. But it defines how the users perceive their surroundings that in turn define the interactions.

Situatedness is linked strongly with the *split domain* theme, more specifically its subtheme *beyond the frame*. The previously discussed subtheme concerns more about the importance of syncronising the design of nearby surroundings with the IT and this depends on the location of IT.

Some studies state the influence of surroundings on interactions with interactive objects. But the surround here refers more to the crowd of people or passer-by. For example, Chen et al. (2014) states that the nature of a location's crowd is a key to the length of an interaction with public technology. Public nature, such as people passing around, as suggested by Muller et al. (2012), make a user more alert to surroundings. These studies further explain the users of interactive technology often feeling uncomfortable being seen using something that they cannot master. In other words, the users can be timid. As a result, during an interaction with public technology the users would constantly using the screen and looking around, hence the minimum interactions.

A sketch from observations interestingly captures how the users acted to overcome the situation. They may be distracted by other people around, but rather than pulling away or stop interacting, the users position themselves accordingly to cover the screen as much as they can with their body.

Sketch 3. A user covering the screen in a busy environment

Connected with the theme *split domain*, many senses are used in the situatedness of interactions including visual, olfactory and tactile. The users' awareness depends on where the interactive screen is located. Arguably the better the location the better the quality of the interactions with the IT.

Despite the nature of IT as a public technology, a well-located IT can provide a sort of personal space for the user, one of the findings suggests. So a crowd of people or passer-by distraction can be mitigated. Browsing a physical fashion store can be inconvenient sometimes. For one, when the store is busy with visitors during promotion season thus difficult to check a particular product.

Another inconvenient moment is when additional information about a product is needed but could not be found on the shelf. Store visitors may be able to use their personal devices to overcome those issues. Often times however, using personal devices inside a store can also be inconvenient.

This is the time when IT can function as a personal space. Although the ITs in this research do not have a separator or dedicated booth, the nearby area seemed well designed resulting this personal space. As such the finding shows that IT provides this personal space so the users can check the detail of merchandise and find more information in their own time conveniently.

Other than that the personal space given by IT allows the users to actively engage and obtain additional information in their own space without having to interact with the stores' staff. At times store visitors can be reluctant to find the store staff or unavailable. All of these are reflected in the quotations below.

> *"… It's ok in here. You can chill, you know just use this. I can get around checking more…"*
> *(P12, Niketown)*

> *"… we are in the middle of the store but people don't really care [other store visitors]. I'll take my time…" (P51, Levi's]*

> *"… like self service checkout in Tesco, you can do it yourself. I think it's great customizing something yourself. I customized my jacket once and the guy [the staff at the Levi's alteration] didn't even get it. He looked so tired. Can be annoying sometimes dealing with them [staff]…" (P33, Levi's)*

Interaction command

As the last subtheme within the *Interaction moments* (theme), *interaction command* is about the all the graphics for navigating IT and how they strongly shape the interaction process. This subtheme has a strong connection with the subtheme *within the frame*. To briefly re-explain, *within the frame* is associated with the perceptions taken when seeing something as a whole or as one visual on interactive screens. As such navigation graphics are components of the content what can be seen on the IT screen. At the heart of this subtheme is navigation graphics, the signs whereby the user could retrieve expected information, get into a particular page of the content or where they want to be in the digital world efficiently and effectively. What is more navigation graphics are the "paths" for exploring the digital world of IT.

Technically the whole screen of IT is touchable, in a sense that it can be designed for interaction purposes. Ordinarily, not every inch of the screen is designed for those interaction purposes, ie, it is not clickable or touchable.

Similar to websites or applications, only several areas within the interface that can be touched or clicked, and these are the graphics that can be called as navigation graphics/buttons. Unlike decorative graphics, these navigation graphics are "active", meaning they provide responses in relation to the function. For instance, right and left arrows enable a user to swipe or navigate to the right and left of the screen but not up and down.

Many users participated in this research indicate their ability to identify those touchable areas, which are the navigation graphics, on IT screen. At first, users would generally perceive the whole screen. Then their attention would immediately pointed to graphics for navigation. This can be termed micro

interactions; a time where the focus is on the graphics that are able to move a user to the next step (Dodson and Lam 2011; Breslav, Khan and Hornbaek 2014).

All this suggests that some graphics on IT can communicate their purposes or functions to users, similar to the physicality of IT, which can convey the capacity of its interactivity. Aspects such as shapes, colours and art direction can make some graphics stand out from others, showing their interactivity capacity. It is quite common to see navigation graphics that look like graphics on objects in the physical/real world.

Understandably, many designs of navigation graphics were adopted from wayfinding systems found in public spaces, such as arrows for directions in shopping malls or airports (Mollerup 2013). It should be noted however that some users of this research could identify the navigation tools that do not look like the generic ones. Often times the users would use, swipe and/or click, without having to look for a particular shape graphics. The angle of an object in an image for example, can communicate that it can be rotated. The capacity of screen areas to convey their navigation function and how they can be perceived by users, can also be seen in some excerpts below.

 *"… Right how I can go back? Oh ok here [tapping an arrow shaped graphic]…" (P16, Niketown)*

"… the symbols [pointing to some graphics for customising] are clear so it's easy to use this…" (P22, Levi's)

"…yeah, I knew I can do this [navigating] because I saw some of the signs before [navigation graphics at the beginning] …" (P39, Levi's)

This finding points to navigation tools that can actually be moved further from the usual navigation graphics shapes. Designs for navigation tools do not always need to be adopted from objects from the real worlds as suggested by previous

studies (Such as Gehrke and Turban 1999; Benbunan-Fich 2001; Adami 2013; Magrath and McCormick 2013). Innovative content design for navigating IT can also be applied and images and different graphics shapes can be utilised as tools for navigation on IT.

Connected with the interaction command, one sketch from the observation shows how navigation tools influence the way the users use the IT. The users seemed hesitant when using IT, even when they are already starting to use it. The way they stand reflects this; a considerable gap appears between users and the IT, as can be seen in sketch 4.
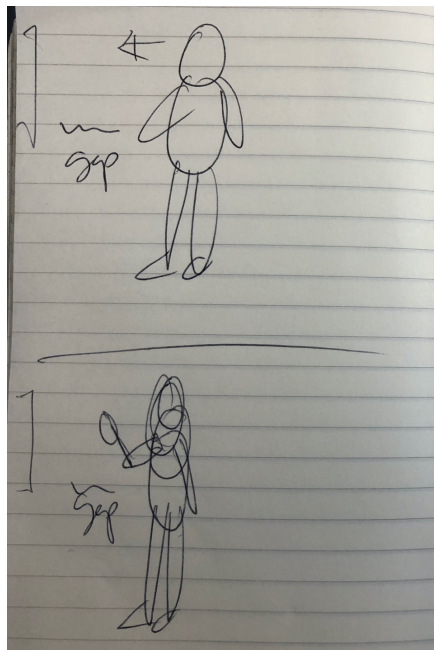
Sketch 4. Distance when using IT

Interestingly, the gap is not something negative. Because apparently having a gap when using IT is more convenient for users. Interviews following the protocol analysis and observation (PO) confirmed that the size and visibility of IT's navigation graphics made the users into such a standing position. They feel to have more breathing space as a result of the graphics. This should mean that a well-designed navigation graphics can help the users to feel more comfortable. All this indicates that the users also feel comfortable for the screen to be seen by

other store visitors. This finding answers the claim made by previous studies regarding performative interaction; often times people are reluctant for their movement and what they are accessing being seen by others (Chen et al. 2014; Williamson 2014). While the claim can be true, the finding of this research indicates the possibility to mitigate that reluctant feeling via digital graphics, ie navigation tools, on IT. Another point to note, this shows a relationship between digital graphics and actions, how digital graphics influence movement when using an interactive object.

There were four main themes embodying a total of nine subthemes. Theme 1 split domain carries within the digital frame and beyond the digital frame. Theme 2 digital merchandise consists of digital merchandise details and digital merchandise motion. Theme 3 interactive information consists of interactive useful information and interactive artistic information. Theme 4 Interactive moments embodies the physicality, situatedness and interaction command. All of these have been elaborated presenting findings from the primary research. In the next subchapter that is discussion, all themes and subthemes are amalgamated from which central ideas are displayed and discussed with literature/theoretical background from chapter two.

4.3 DISCUSSION

The themes and subthemes discussed previously present many insights that compose scores of central ideas of this thesis in relation to the phenomenon being studied: consumers' interaction experience with interactive in-store technology in fashion stores. The four themes along with the nine subthemes that have been presented were converted into core concepts containing central ideas of this thesis research.

User experience design approach is the main theoretical framework used as the lens to explicate this thesis. Linking the methodology and primary research, it works well in generating the findings. Moreover, its characteristics are embedded in the core concepts of this thesis research.

The first core concept is: the notion of *dynamic experience* through which users of interactive in-store technology in fashion stores can experience the digital and physical worlds dynamically, and then attain a heightened overall/store experience. The second core concept is: *channel harmonization*. This concerns how each channel, the interactive technology (IT) and the physical store atmospherics, has its own roles and thus can be designed to work together.

In this section, the core concepts of the findings are discussed together with important and relevant literature from chapter two. To note, one prominent user experience design (UXD) framework was employed to render the excerpts of meaning (code) in the second stage of the analysis. As has been suggested in much literature, qualitative research does not normally use any theory, model or framework in a restrictive manner given its explorative nature (Creswell 2013; Bryman 2015; Blandford 2016). In some cases however, those are used as a research guide (Bryman and Bell 2013). This has also been acknowledged in research with ethnography strategy especially the short ones; theories should be used to maintain consistency and focus of the phenomenon being investigated (Pink 2013). The UXD framework employed is called *the four threads of experience* (4TE), designed by McCarthy and Wright (2004).

The 4TE carries the threads sensual, compositional, emotional and spatio-temporal. The core assumption of the framework is that an experience with an interactive device is composed by several aspects: sensual, emotional, compositional and spatial-temporal; all of which are interweaving evenly and cannot be separated. Further, these are an iterative process of meaning making and action.

The thesis' core concepts are also aligned with McCarthy and Wright's (2004) the four threads of experience framework; consisting sensual, emotional, compositional and spatio-temporal. When using IT, a user would experience all four threads in parallel. During interactions with IT, the human sensory perceived the digital and physical worlds' elements (sensual), then processed via thinking (compositional) and feeling (emotional), all of which are shaped by the situation and condition (spatio-temporal) at that interaction time. Further, this process points to the notion of the interplay between meaning making and doing during peak experience, which is the active interaction moment, with interactive objects (McCarthy and Wright 2004).

The 4TE was used as the lens to see phenomenon of the research more clearly (literature review), through which a set of research questions was constructed. More importantly, the framework was also used as a guide to analyse the primary research data. The alignment of the thesis' core concepts, literature and framework is discussed in the following. Further, the discussion also highlights the extension and/or new ideas from the core concepts of the findings.

Dynamic experience *– control – challenges*

The first central proposition of this thesis research is the notion of *dynamic experience* that can be attained via interactions with interactive technology (IT) in fashion stores. This proposition incorporates all themes and subthemes discussed in the previous section. The core assumption of dynamic experience is that IT enables the user to dynamically experience two atmospherics domains, digital and physical. Thus shifting of perceptions occurs from perceiving the digital domain atmospherics, then switching swiftly to perceive the digital domain atmospherics, then back to digital. When using IT, a user would naturally focus their attention and perception on the digital domain atmospherics, which

is the content on IT screen. Yet at times they would also glance around either to check, compare or simply see what is happening in the surroundings. As such, they oscillate between experiencing the content of IT and experiencing the physical store's surroundings. For this reason the experience during interactions with IT is highly active, perceptible and more importantly, dynamic.

It should be noted that this dynamic experience usually happens unconsciously and with no precise timing. For instance, one user can be very focused on using IT and glancing less on the surroundings, while another can be less focused on the IT and seemed distracted or attracted by the surroundings. Digital appears to be the dominant domain but the physical domain help overlay the peak experience with intense interplay.

Dynamic experience – control – challenges

Dynamic experience offers a new idea of shifting experiences between two worlds when a user is interacting with IT. It is important to underline however that the users have a total control over this experience shifting. In other words, when it comes to experience with technology, especially types of public technology, it is not always about providing immersive (eg, VR) and/or playful digital graphics (eg, AR). At times public technology users need a sense of embodied awareness because it is connected with a higher sense of control of a moment. In other words, the users of public technology always want to be in an alert state during interactions so they can have self-control. Interactions with IT generate dynamic experience with a higher control of what to experience.

This is evidently different from experiencing independent augmented reality (AR) or virtual reality (VR). With the former a user would see digital graphics overlaid on the real/physical world. The physical world dominates the perception in AR

(Azuma 1997; Alkhamisi and Monowar 2013). The latter, in contrast, takes a user into an immersive digital world with no physical world elements whatsoever (Azuma 1997). That said the experience is more pointed toward one specific domain that is the digital. This means that although an AR system or VR system can provide great experiences for their users the domain of the experience is restricted. Studies have suggested that AR and VR can help achieve escapism or playfulness (Chang and Siregar 2016; Pantano 2016). However, there seems to be a lack of control over those experience aspects; unable to shift between the two domains. The users have less control over the experience shifting as such.

By contrast, dynamic experience when using IT provides greater control over the framed experience or moment. So the worlds, digital and physical, are not experienced in a "blended" manner, unlike the worlds on AR or VR. Rather, they are experienced separately via its own "frame", one frame of digital and one frame of physical. The characteristics of the frames differ, as noted from the observations the digital world frame tends to be more simple, focus and contains a specific theme, which usually is the extension of one of the themes in the physical world. And the physical world frame is often more complex and covers several themes. Despite the differences, the two frames have a strong connection and relevance, given the fact that they belong to one brand and are a combination of two channels, that is IT inside a physical store.

The two frames have clear borders as such; two separate world frames with a strong connection. With the frames being clearly delineated, the experience is all about shifting between the two. Users are able to get epistemic experience without being passive and have the ability to control which frame they want to experience. In other words, controlling their own experiences. Dynamic experience with IT affords a user to focus on the digital world but still can experience the physical world elements whenever needed.

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This control over experience of the dynamic experience is in the same vein with some interaction experience studies. The studies posit that perception is key to experience; the only way for experiencing is by having human senses to perceive inputs (McMillan and Hwang 2002; Wright and McCarthy 2010; Sohn 2011; Jantzen 2013). This should mean that humans, the users, are actually capable in differentiating and selecting inputs. By doing this, they are able to some extent control what they want to perceive, what they want to experience. Further, it should be underlined that this thesis research offers further idea of controlling what to perceive and what to experience via the notion of framing the experience. The users of IT in fashion stores therefore are able to perceive the two worlds that are digital and physical separately as frames. Further, they are able to experience those frames dynamically in their own time and convenience.

Relating the notion of control over experiences with McCarthy and Wright's (2004) the four threads of experience (4TE), the former is more closely linked with the compositional thread. It concerns more about how users see experience elements fitting together to form the experience itself. It further suggests that the users of interactive devices have greater sense of control over the interactions' stimuli. Users would generally interpret the underlying meaning and function of the elements, and then connect them to form a peak experience (McCarthy and Wright 2004). This peak experience as a compositional process is comparable to the "control via framing" in *dynamic experience* proposed in this research. However the latter elevates the core assumption of the former by indicating the possibility to perceive and experience the elements of experience separately (framing) without having to be reductive. Moreover, the framing process will finally generate another level of experiences; it is about building a distinctive experience from experiences; experiencing the digital world frame and the physical world frame dynamically that leads to a distinctive one.

Dynamic experience *– control –* *challenges*

Dynamic experience demonstrates the necessity for IT users to push more effort and energy during interactions. When using an unfamiliar interactive technology a user shifts into a higher awareness trying to focus with the IT while at the same time being aware of surroundings. As suggested by Akpan et al. (2013) the situation and condition of a space shape how people use interactive objects. Previous user experience design (UXD) studies have concluded that using a public technology requires more effort (Williamson 2014; Chen et al. 2014). People as the users often feel unfamiliar when using a public technology, thus tend to rely on personal preconception and what is presented, that increases awareness and focus (Brignull and Rogers 2003; Muller et al. 2010). Moreover, when using a public technology people tend to be alert to their surroundings (Alt et al. 2012; Muller et al. 2010). Two separate studies by Williamson (2014) and Chen et al. (2014) similarly suggest that a user of an interactive object tends to be influenced by "imagined audiences"; a user is in aware mode and can either be motivated or demotivated to use the IT further.

Therefore this makes the interactions more challenging because users make more effort in solving the interaction (with the system) while at the same time looking around to be aware. The difference between previous studies' findings and this research is the enjoyment from experiencing the surroundings. Previous studies gravitate towards the negative effect of surroundings; crowds and other elements of public space usually mitigate the quality of interactions with public technology. On the contrary, this research proposes that the surroundings are important for shaping better interactions with a public technology (ie IT). The physical world's elements support the digital ones by providing more challenges to an interaction with which a dynamic experience can be attained.

It can be argued therefore that when using IT such a challenge can heighten the overall store experience of an IT user. First because in that moment of interactions the user would be in a constant state of active awareness resulting from the effort of perceiving and doing at the same time. More importantly because the users are "challenged" by the physical world's elements (surroundings) while they are forced to cope with the IT's interaction system. The challenge here refers to the experiencing process during which the users intentionally framed the two worlds. Although the degree of alertness or awareness can be high it influences the overall experience positively. Two studies concerning experience equally suggested that the best experience is normally achieved via an additional voluntary effort when doing something, because the awareness towards stimuli tends to be higher thus can be perceived more clearly (Csikszentmihalyi 1990; Hansen and Mossberg 2013).

The four threads of experience (4TE) projects the same concept: the place and time in which a user is presented (spatio-temporal thread) propel the level of challenges of the interaction experience. This is because experiences are transient, meaning the experience with an interactive technology will keep changing depending on the situation. The spatio-temporal thread of the 4TE further notes that the quality and sense of space-time pervades experience. As McCarthy and Wright (2004, p. 91) puts it "… time may speed up or slow down; pace may increase or decrease; spaces may open up or close down, affecting our willingness to linger or to re-visit such places…".

All this gives the idea that the physical world governs the way users see the digital world and not the other way around. While this idea is embraced by the *dynamic experience* proposition, it does not clearly state the possibility for equally balancing the experience of physical and digital. In can even be said that the space and time are inherently unpredictable thus the users can only perceived it. The *dynamic experience and challenges* concept suggests that users can also be active in selecting and managing the challenges. Space and time may be

constructs that are difficult to control. It can be argued however that the users have the capability to transform those challenges (physical) into a relevant and positive experience that complements the other experience (digital). During interactions with IT as a public technology, the users can have a psychological state for managing challenges. This is possible because the IT is installed inside a fashion store, meaning the content is definitely linked with the store brand. Many aspects of the situation in a store (physical worlds) can be managed and designed in such a way so it fits with the content of IT (digital worlds) or the other way around. As such dynamic experience projects a more confident possibility for integrating IT in fashion stores; integrating digital with physical.

Channel harmonization

The core concept one, *dynamic experience* concerns primarily on the experience of users. *Channel harmonization* is actually correlated with the experience as well, but it contains key findings that provide more understanding about how best to integrate IT in fashion store that can provide a holistic experience. This proposition is also discussed with important and relevant literature from chapter two as well as the 4TE.

Channel harmonization brings deeper insights into the smaller parts of the digital and physical worlds that can be designed accordingly to shape the IT users' experience. In this case, atmospherics plays its role as experience objects. This should mean that the two world frames are constructed by atmospherics. And all stimuli that IT users perceived to form dynamic experience derives from atmospherics cues such as colours, lighting, merchandise, images, among other cues. These take the form of digital and physical. *Channel harmonization* posits that both digital atmospherics and physical atmospherics elements are key in forming interaction experience. Both types of atmospherics serve as the stimuli that the users perceive. But what is more important in this concept is the idea of

focusing on only certain elements. In other words, irrespective of the possibility of having various combinations of digital and physical elements and making them fully comprehensive, focus or selective implementation is required. The content of IT and the physical stores' atmospheric should not always be syncronised. Designing or planning the roles of the channels should be considered more. For example, suggesting something on the IT to look for in the physical store. Or showing posters or signage that convey a message that is more elaborated on the IT (this is discussed further in the chapter five).

The concept about how digital atmospherics and physical atmospherics elements are key in forming interaction experience accords with those from the key studies on atmospherics. From the earliest studies on physical atmospherics, such as the work of Baker et al. (1992), through a development period (Turley and Milliman 2000), to the latest one from Ballantine et al. (2015), suggest that a well-designed atmospherics can help increase store visit engagement. Similarly digital atmospherics or "e-atmospherics" studies conclude that it can help grow positive affect or emotion leading to engagement (Eroglu et al. 2003; Poncin and Mimou 2014). The 4TE framework, too, explains the importance of designable object elements in forming experience via human senses (sensual thread). The thread suggests that "concrete, palpable, and visceral character of experience" perceived by users fuel the experience (McCarthy and Wright 2004). The framework however connects the overall atmosphere only to how the users feel. By contrast this research shows that all types of atmospherics can form a new channel for experience.

Atmospherics whether physical or digital have long been acknowledged as elements or cues that can influence consumer behaviour positively. But studies of atmospherics seemingly position those elements or cues as passive objects despite the controllable/manageable characteristics. *Channel harmonization* proposes that particular digital atmospherics can be treated as interactive objects. The users can experience interactive digital atmospherics on IT content.

As displayed in the key findings of this thesis research, the interactive trait of IT content enables a user to "pull" atmospherics according to their interaction requirements. In this sense a user can also control the atmospherics elements they want to experience.

With this in mind, *channel harmonization* further argues that digital interactive atmospherics in IT be positioned in the centre of physical atmospherics. Physical atmospherics should be more comprehensive as the physical store is often still be regarded as the "house" or hub channel of a brand. Fashion brands can explore and add more detailed elements for their physical stores. IT and its digital atmospherics on the other hand, should be positioned as the supporting channel. As such, IT digital atmospherics should not have content as much as the physical store. IT should be utilized more for special content or certain aspects of the physical store. This way, the added benefit can be stronger. The value of IT to increase the overall experience can be higher. The next subsection presents a discussion about how the research questions of this research have been answered by the findings and the core concepts.

4.4 REVISITING THE RESEARCH QUESTIONS

Three research questions have been presented presented following gaps identified via the literature review. The exhaustive methodology of this thesis, containing three methods of data collection, was successful in generating significant findings and core concepts that were the essence of the answers to the research questions. This subchapter presents the answers in order from research question one to three.

Research question one (RQ1)

What is the interaction experience that consumers elicited from interactive technology in fashion stores?

The importance of deconstructing and identifying elements of the experience towards stimuli, has been put forward by many researchers (for example Csikszentmihalyi 1997; McCarthy and Wright 2004, Hassenzahl 2010; McCormick and Livett 2011; Sohn 2011). Extracting these elements could help understand the overall constructs in the process of the interaction, which consists, a human, the object and the interaction itself. Focusing exclusively on the object (cues) or a human's internal state would not be sufficient. Experience is a stream of consciousness, perceiving in high awareness the object in question while also fueling the perception with prior knowledge (Jantzen 2013). In the digital world the relationship between people and technology is becoming closer. This surely points to the necessity of understanding the relationship from both utilitarian and hedonic motivation perspectives. There is a considerable literature that has covered this and the experience elements. However research that focuses on interactive in-store technology is limited. Moreover, it mostly only focuses on one construct and/or one motivation (for example Dennis et al. 2010; 2014; Pantano and Viassone 2014; Poncin and Ben Mimoun 2014). As such, it is paramount to identify the interaction experience elements with interactive technology in fashion stores.

Four main themes were constructed from the findings; these are *split domain*, *digital merchandise*, *interactive moments* and *interactive information*. They are the interfaces that are linked strongly, forming one framework of interaction experience with interactive screens in fashion stores. The framework comprehensively presents parts that jointly construct the totality of consumers' interaction experience. The ten parts are also interrelated in the interaction experience process.

Three elements of human experience are covered in the main themes and these are user (perception), the stimuli and the interactivity process itself. Going back briefly to a discussion on experience in the literature review, Experience is about the constant interplay between thinking-feeling and doing (Jantzen 2013). Specifically during an interaction with an object, awareness generally increases. Thus, although knowledge is important, actions and responses tend to lean on the embodiment perceptions of stimuli. This should mean that streams of perception that rely on human senses are more essential. They are key defining interaction experience.

The *Split domain*, the first main theme, is primarily concerned with visual experiences happening during interactions with interactive screens. The users would see through the width of their frames. Other themes, *digital merchandise* and *Interactive information*, frame the thinking and feeling process further by absorbing information that can be selected to fuel their knowledge. Lastly, the *interactive moments* theme covers the actions that are connected with the first two themes. In fact, it is the element that bridges perception and stimuli; the actions are embodied and contextual. Interaction experience is more about perceiving, but knowledge is fuelled not only during the moment but also afterwards. By having the themes in the form of the mentioned framework, elements of interaction experience have been elicited. Research question one is therefore answered.

Research question two (RQ2)

How do consumers interact with interactive technology in fashion stores?

How consumers interact with in-store interactive technology (IT) can indicate much about the quality of the interactions. This particularly concerns the actions, such as how consumers approach an interactive technology, how they stand, how they navigate. Interaction design studies (for example, Marshall et al. 2011a; 2011b; Akpan et al. 2013) suggest what people express verbally can be different from what they actually do. Thus observing how the actual interactions occurred not only can help confirm what they have said, but also to obtain data that cannot be achieved via verbal data alone.

The findings of this thesis carry insights into how consumers (user) interact with IT. The theme *interaction moments* particularly displays these insights. In the subtheme *physicality*, the finding shows that users tend to recognise and approach IT that looks like their personal devices, such smartphones and tablets. Additionally, users appear to like medium size IT screen better than the small or large ITs. The reason for this is because so they could cover the content displayed on the IT with their body. At times users can be unconfident about their interactions with IT being seen by other people. The physicality of IT also influences the way a user stand when using it.

A further insightful finding is found in the subtheme *situatedness*. If designed correctly with "personal area" users may feel comfortable to use IT as it can provide them with a space where they could engage with information and the brand. Further, the finding suggests that users still prefer to "glance" around when using IT. They want to be aware of their surroundings; such crowd in the area, merchandise they saw on the IT. The researcher how obtained data on how consumers interact with IT. With this, research question three has been answered.

Research question three (RQ3)

In what way does the interactive technology heighten consumers' experience?

The last research question intends to find answers that can fill the last gap identified in the literature review. Studies concerning physical and digital store experiences increasingly found. Those studies mostly conclude that such an amalgamation of physical and digital can help elevate consumers' experience (Dennis et al. 2014; Poncin and Ben Mimoun 2014; Huang and Liu 2014; Kent et al. 2015). Sensory experiences acquired from the physical store generally are high. Tactile experiences are the chief reason as consumers are able to touch and try merchandise. All this is overlaid with digital experiences that can augment the overall experiences. Interactions with touch screens are arguably the new tactile experiences; where movement of the hands and tapping screens with fingers transport users into a digital world while in parallel embodied in a physical store. Findings in response to the third research question clarify the way to attain the mentioned state of experience.

Consumers will normally have their objectives for a visit to a fashion store. Finding more information and to be inspired are the most common objectives on top of store browsing. Basic information such as size, colour, price and offers is provided in-store. There is however some information that is less available. Finding fabric information for instance. At times, when required, they use personal devices to obtain the information they seek. Using a mobile phone may feel more familiar, but this can be inconvenient. Network/signal can be poor and the connection can run slowly. In addition, the store might be busy with people. Interactive screens enable consumers to access supplementary information more conveniently.

Interactive technology can also be designed in such a way as to provide exclusive information coupled with novel interactions. For one, detailed information of a fabric innovation conveyed via micro zoom 3D animation. Trivial it might be, that

extra experience can leverage consumers to another level of holistic experience. From a servicescape perspective, unhappy consumers can be mitigated. Sufficient information in relation to merchandise, such as options, price, availability, are available. Digital experiences are able to enhance all of these engagement aspects.

Consumers can experience a heightened in-store experience from interactions with interactive screens in fashion stores. Supplementary information and novel digital interactions are the two primary elements that help attain that. By understanding the ways, the practical insights afford deeper comprehension when integrating interactive screens in fashion stores. All this satisfactorily answers the last research question.

4.5 CHAPTER SUMMARY

This chapter presents the detailed findings of the research. The introduction of the chapter describes in brief the content. It starts how the methodology; especially the data collection was successful in generating the insightful data. The analysis of data resulted in findings that are presented thematically in the subchapter: *themes elaboration*. There are four (4) main themes: *split domain*, *digital merchandise*, *interactive information* and *interaction moments*. Moreover, there are nine (9) subthemes: *beyond the frame* and *within the frame* (split domain), *merchandise detail* and *merchandise motion* (digital merchandise), *useful information* and *artistic inspiration* (interactive information); and *the physicality*, *situatedness* and *interaction command* (interaction moments).

Following the elaboration of the themes is another subchapter that is: *discussion* in which central ideas of the findings were extracted and transformed into two core concepts and discussed with literature form chapter two and the main framework used in this thesis research, the four threads of experience the (4TE).

The core concepts are *dynamic experience* and *channel harmonization.* The former posits the idea of the possibility for IT users to shift experiences between the frame of digital world (domain) and the frame of physical world (domain) dynamically. This experience shifting not only permits the users to be in a higher state of control, but it also provides challenges, all of which can help attain a distinctive experience. The latter posits the idea of using selective elements only for IT, this way it complements the physical store enabling it to have a more comprehensive appeal. Therefore, the channel harmonization enables a more solid dynamic experience.

CHAPTER FIVE:
CONCLUSION

5.1 INTRODUCTION

The previous chapter presents the key findings of this research; two core concepts that were constructed from the themes and subthemes. Moreover, the key findings were discussed with literature that was reviewed in chapter two. In addition, the research questions were revisited to present the responses.

This final chapter provides the conclusion and implications of the project. The chapter starts with an explanation about the achievement of the aim and objectives of the research: to explore consumers' interaction experience with interactive technology in fashion stores. Following that, the theoretical implications and practical implications of the research are demonstrated. The chapter concludes with the limitations of this research and recommendations for further research.

5.2 THE CONCLUSION OF THE RESEARCH

The research aimed to explore consumers' interaction experience of interactive technology in fashion stores. There were six objectives set to achieve the aim. What follows are the statements of the accomplishment of the objectives. By completing the objectives, it can be stated that the aim of the research has been achieved.

Objective one

To identify gaps in literature by conducting a literature review surrounding the topic that contextualised experience and experience with technology, categorised interactive technology in fashion stores, and investigated the elements of a physical fashion store and channel integration. Moreover, it will evaluate the suitability of user experience design (UXD) as a research approach

All of these have been fulfilled. The relevant literature was reviewed, starting with experience. The concept of experience was contextualized before being linked with interactive technology. Literature on interactive and non-interactive in-store technologies was reviewed next and interactive technology in fashion stores was categorised. This led into atmospherics and fashion marketing channels and the intersection between digital and physical atmospherics. Then fashion consumer behaviour, such as digital interaction and consumption. The use of technological devices and other channels in parallel by fashion consumers necessarily formed an important element of the review. This informed the user experience design (UXD) approach and its suitability for this project because of its holistic engagement with experience: it has the capacity to explain the aspects of interaction experience along with other aspects surrounding it.

A gap in literature was identified successfully through the review. It was important to understand more about the interaction experience with interactive technology

in fashion stores. Very few studies have looked into interaction experience with technology; moreover, they mostly investigate the topic from a marketing perspective. The research gap subsequently helped to construct research questions that guided the next steps of the research. In this way knowledge about interaction experience with interactive technology was attained and a better understanding of its application in fashion stores was acquired.

Objective two

To design a methodology and apply methods underpinned by a user experience design (UXD) approach, and apply them as the driver for the primary research

The planned methodology was successful in propelling the primary research of the research. Interpretivism was embraced as the philosophy to explore the subtleties of the core phenomenon, experience. In terms of strategy, rapid ethnography was used to plan and implement the data collection. Many UXD studies, both academic and practice-based, have employed this combination of research philosophy and methodological strategy. While normally such a combination is used for shorter studies, it worked well for this research. In particular, the interpretivist philosophy allowed the researcher to see and approach the phenomenon more clearly and the rapid ethnography strategy served as the plan for executing the methods.

Objective three

To obtain data for answering the research questions through primary research that requires in situ data collection in fashion stores through appropriate methods

Using an interpretivist rapid ethnography, three methods were planned and implemented to gather data to answer the research questions. The methods

were protocol analysis, observation and interview. Protocol analysis was employed for answering research question one and three, and observation was used for answering research question two. These were productive in obtaining relevant and rich data. The protocol analysis method was effective in eliciting users' responses during interactions with IT. This was because the users were not faced with questions from the researcher, rather they expressed what they thought and felt freely and consequently focused more on the interaction without being interrupted.

The observation method was very practical in capturing the users' actions during the interactions and notes and sketches were easily made without hindering the protocol analysis. In parallel, the researcher was able to manage the protocol analysis while undertaking the observation. Lastly, the interview method was useful to confirm some responses that were gathered with the two methods. Moreover, because the interviews were undertaken after the protocol analysis and observation, the users now could be more focused on answering confirmation questions from the researcher. The three methods have been proven to work well independently and jointly.

Objective four

To generate findings and insights that can answer the research questions by analysing the data gathered via the data collection methods

The findings of this research are presented thematically. Given the combination of the three methods (POI), there was an abundance of qualitative data. However, to achieve relevant and responsives to the research questions, the data needed to be evaluated accordingly. In doing so, the analysis went through three stages, namely coding, data reduction and categorisation. This was undertaken with the help of observation notes and the four threads of experience (4TE) framework. The iterative process of data collection and analysis also helped the

process to be more efficient. This is because not only the researcher could generate findings more quickly, but also optimizing the quality of the data via constant review of questions and responses (data collection). As a result the data was significantly reduced and more importantly, the analysis produced highly relevant findings that were transformed into four themes and nine subthemes. They contain findings and insights that have the capacity to response/answer the research questions and to help achieve the research aim.

Objective five

To generate a theoretical foundation for understanding interaction experience with interactive technology in a fashion store

The themes and subthemes have led to core concepts of this research: *dynamic experience* and *channel harmonisation*. These core concepts were then discussed with the theoretical background (literature) and the four threads of experience (4TE) from chapter two. There was a strong alignment between the core concepts, literature and framework. But more importantly, the findings show not only the extension of knowledge from previous studies but also new and fresh insights. Given the UXD approach, the insights are feasible in practice, thus providing insights for integrating IT into fashion stores.

Most importantly, the research findings and core concepts have advanced knowledge of user experience with interactive in-store technology in fashion stores. This research put forward the concept of separate stimuli consisting of digital and physical frames that allow IT users to attain dynamic experience. This is a new concept that is distinct from previous studies' findings that state that immersive stimuli or multi-sensory stimuli are the most effective way to achieve a distinctive experience. This research further demonstrates that experience can be intensified via more actions (physical movements) and less information-based input.

Objective six

To design a framework for integrating interactive technology in a fashion store

An interaction experience framework has been designed based on the findings of the research; the framework is built from the themes and subthemes, as well as the core concepts.

These were discussed with literature and the four threads of experience (4TE) from chapter two. There was a strong alignment between the core concepts, literature and framework. But more importantly, the findings show not only the extension of knowledge from previous studies but also the new and fresh insights. Given the UXD approach, the insights are feasible in nature, thus providing insights for integrating IT in fashion stores.

By fulfilling all the objectives steps, it can be stated that the aim of the research that is to explore consumers' experience with IT, has been achieved. The findings and core concepts of the research have the capacity in responding to the research questions. The findings and the core concepts therefore were capable in filling a gap in knowledge by providing a better understanding of experience with interactive in-store technology in fashion stores.

In sum, users of interactive in-store technology (IT) can experience the two frames of the digital and physical world dynamically, which in turn leads to a distinctive and holistic experience. The users also prefer to be in control, not only over the interactions with the IT, in terms of content and system, but also over the detailed experience from the frames of digital domain elements and physical domain elements. In doing this, the users go through challenges that enhance control and experience even more. Lastly, channel harmonisation is required for achieving all this. Fashion physical stores are still regarded as the "house" and

hub of a brand and for this reason the physical stores are expected to be the most comprehensive experiential channel. The IT therefore, is supporting the channel and complementing the comprehensiveness of the physical store. What should be underlined is that this positioning does not lessen the quality and importance of the IT. In fact it can offer an exclusive dimension. This should mean that fashion brands should focus more on selective concepts, ideas and design for their IT, all of which can increase perceived exclusivity. Other than that, IT plays an important role for the physical fashion stores. It serves as an atmospherics (including digital atmospherics) and brand facilitator. Once more demonstrating the capacity of IT in elevating the overall in-store experience. The convergence of the physical and digital world can be enhanced through smooth integration by design.

The concluding argument is that the findings and core concepts of this thesis demonstrate the importance of interactive technology for physical stores and further, they can be used as the basis for how best to integrate interactive technology in a physical fashion store to help increase consumer experience. The user of a well-designed interactive technology in a fashion store can acquire a dynamic experience via frame shifting between the digital world and the physical world.

5.3 CONTRIBUTIONS TO KNOWLEDGE

This research project culminated in a body of work in the field of fashion marketing. In particular, the research has amalgamated the research processes of marketing and user experience design. The key contributions to knowledge are claimed in the areas of the topic of the research, the methodology and the findings.

Consumer experience of interactive technology in fashion stores is a topic that can provide new perspectives for fashion marketing. Because this research focuses on the user experience; it frames the interactions when a user was using an interactive technology, not the antecedents and not the impact. This contribution complements studies that have previously explored interactive technology from other perspectives.

The novelty of the methodology of this research is the second contribution. The methods used adhered to user experience design, a field concerning the experiences when humans are interacting with interactive products. It integrated three methods: protocol analysis, observation and interview. The methods were supported by the fashion marketing theoretical background. In addition to that, a framework from user experience design was employed. All this produced an efficient and effective methodology.

The third contribution is a new understanding of the term experience. To be able to attain a distinctive experience, one does not always need to be immersed by perceptible elements. Channel harmonization can also be key to a distinctive experience. Providing content that is in harmony with the surroundings and designing digital elements that complement physical elements, are ways to attain a dynamic experience.

The research also provides recommendations on how best to design a good level of integration of interactive technology for fashion stores. This last contribution is practicable and elaborated in the *recommendations* section.

5.4 RESEARCH IMPLICATIONS

5.4.1 Theoretical implication

A user experience design (UXD) approach was used as the lens for explicating this research. As mentioned in *chapter one*, this research stands in the fashion marketing discipline with more focus on consumers' interaction experience with interactive technology in fashion stores. The nature of the phenomenon, that is the interaction between people (consumers) and interactive devices (IT) let the decision for the use of the UXD approach. The approach was deemed suitable as it covers most aspects of interaction experience including ease of use and enjoyment sides.

There were three primary functions of the UXD approach for this research. First, it served as an overarching framework for the literature review. Second, it drove the methodology and decisions about the planning of the philosophy, research strategy and methods. Third, it guided the primary research consisting of the data collection and the analysis process. It can be argued therefore that the UXD approach can be applied into research in fashion marketing as it has successfully worked for this research. This further suggests that the UXD approach is useful beyond its application in computer science and psychology, the two fields that have adopted it most.

In particular, this research showed that UXD approach, which is primarily used for projects involving a development of a technology (or prototype), can be applied as well for a large-scale academic research in the field of marketing and specifically experiential marketing. The result of this exploration further strengthens UXD's position as a research approach outside the design and technology disciplines; one which deserves further attention in other disciplinary research projects.

Importantly UXD as a design theoretical framework can be employed for explicating a (topic) phenomenon about the use of interactive technology in fashion marketing. This is more about the consumers' peak experience, their high state of perception (feeling and thinking) when using interactive technology in fashion stores. Thus, it is about a process of conscious doing, not the antecedent or the result of the usage of IT.

Theoretical perspectives that can be found from previous studies that investigate this research topic, mostly derive from motivations theory such as Deci and Ryan's self-determination theory (Beck and Crie 2016) and the technology acceptance model by Davis (1989) that concerns the adoption process of the usage. The other most used theoretical perspective is customer and consumer value that has been used for understanding the results and effects of technology usage on the users. These include theories of servicescapes (Baker et al. 2002; Bitner 1992; Fiore and Kim 2007) and shopping experience and values (Sheth et al. 1991; Babin et al. 1994; Mathwick et al. 2001; Brakus et al. 2009). Again, they did not focus on the process when the users are actually using the technology.

As such this research has demonstrated that UXD as a design theoretical framework is useful and can work properly for understanding a narrow and specific topic about consumers' use of interactive technology. UXD as a theoretical framework therefore can contribute to the more comprehensive customer experience journey (for example as suggested by Verhoef 2009); UXD is one lens to examine the point of the costumer experience continuum that is the engagement of consumers and interactive technology (Verhoef 2009; Lemon and Verhoef 2016). This research suggests the positioning of the UXD theoretical framework in the service interface, retail atmosphere and alternative channels of Verhoef et al.'s (2009) customer experience creation conceptual model.

Lastly, UXD has the capacity to substantiate an underexplored phenomenon; to help build a framework of user experience with interactive technology in fashion

stores. A dynamic experience can be attained by the users via experiencing IT; by experiencing the frames of digital domain and physical domain. This is a highly interactive process during which alertness and awareness are higher, and in which the users reached the high states of control and challenge. A dynamic experience is generated from these interactions. The following is the framework representing the stated theoretical implication.
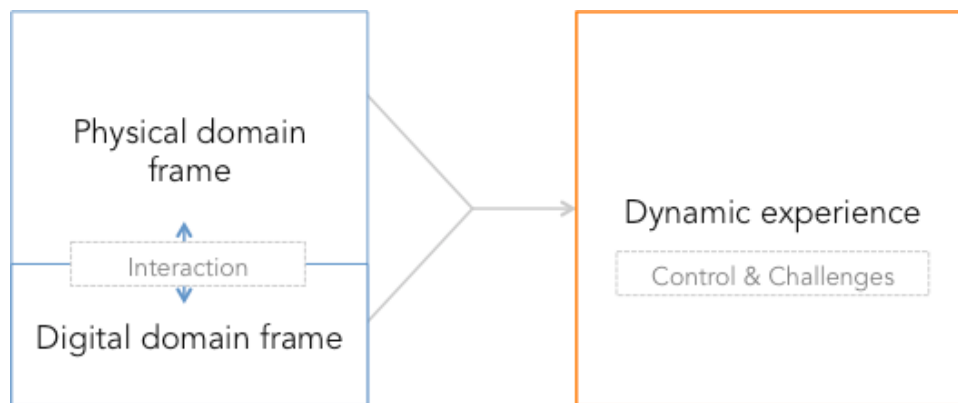

Figure 16. Theoretical implication diagram

5.4.2 Practicable implication

An important implication from this research is its contribution to methodology-in the field of fashion marketing. This research integrated and employed research methods from the fields of marketing and user experience design. While the approaches of both fields can be quantitative or qualitative, the former sits within business or social science research. The latter in contrast is within the realm of human-computer interaction. The employment of the methods of protocol analysis, observation and interview within one coordinated research methodology expands the array of research procedures used in fashion marketing, in particular for research concerning user experience.

This methodology has practical uses for researchers because it allows them to obtain more consumer data within a short period of time. It enables research on fashion user-experience in marketing to focus on the immediate expressions and opinions of participants without limiting them. This can be undertaken via the protocol analysis method and the use of another method, observation. To increase the validity of the data (confirmation) while in parallel obtaining more data, observation method should be applied. Finally, to round up the data from these two methods, researchers can interview the participants. This last method helps to triangulate the data and obtain final confirmation.

This integration of methods has further significance in the field of fashion marketing because it can be a guide not only for the data collection process but also analysis. Iterative data collection-analysis processes are key in this methodology. After several applications of data collection, researchers should start analysing data before conducting the next data collection process.

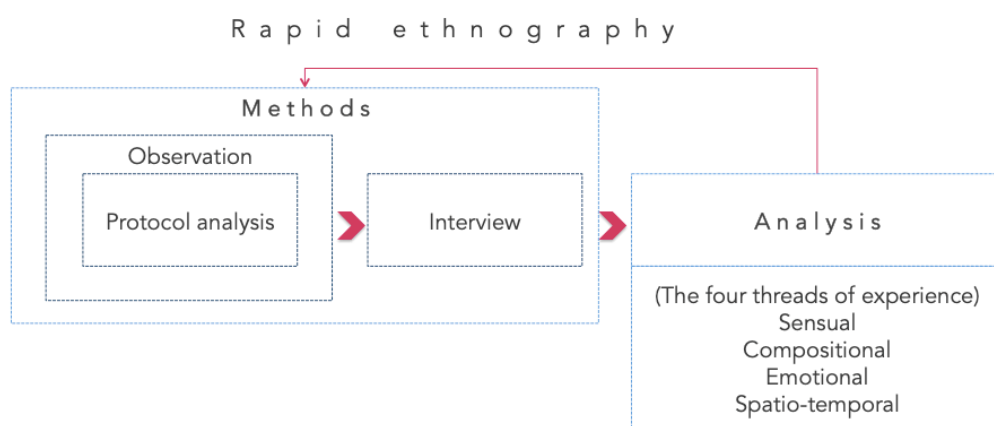A diagram displaying how the methodology and its methods can be implemented can be seen in the figure below.

Figure 17. Methodology implementation framework

5.5 RECOMMENDATIONS

The employment of the UXD approach for this research has been proven to be suitable and successful. In chapter two the UXD approach was discussed in terms of its industry application. Developed from human computer interaction (HCI), UXD's core aim is to provide users with the best interactions when using technological interactive objects, by understanding the user experience holistically (Hassenzahl and Tractinsky 2006). The chief focus however is on the peak experience, during the interactions, not after (McCarthy and Wright 2004; Buley 2013). That stated, generally UXD is used in an iterative process of research and application (i.e. in designing the technological, interactive object). Moreover, this process usually does not take a long time considering the pace of change in "the real world" for technology development (Unger and Chandler 2012).

The UXD approach employed for this research has generated insights on how best to integrate interactive technology (IT) in fashion stores. There are a number of recommendations that can be applied by fashion brands. As a means to make them more actionable, the insights are categorized into three aspects: *outer area, the device* and *system content*. A diagram showing the positioning of the aspects can be seen in the figure 18. What follows the diagram is the elaboration of the recommendations.
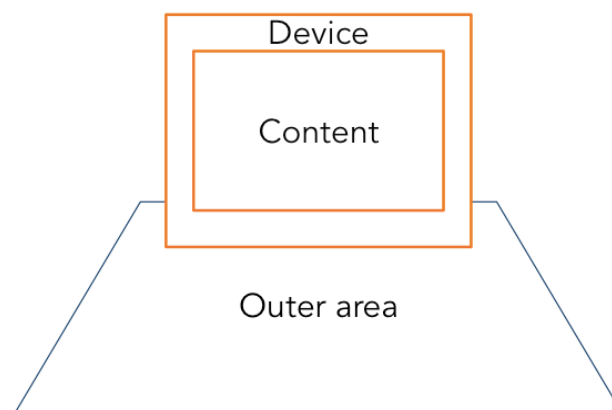

Figure 18. Recommendations framework

Outer area

The IT can intrigue more users and heightened the experience when located in the semi middle area of the physical store. The possibility for the users to feel more immerse with the dynamic experience is higher. They can feel more surrounded by other elements. Placing IT in the corner area implies that it is not novel, thus reducing its attractiveness.

To balance the exposure of the semi middle installation, visible vicinity should be applied. Although it does not necessarily mean that it needs to be confined. IT area can use a particular theme for the elements that is sync not only with the physicality but also the content system. Fashion retailers can use physical visual merchandising materials, such modular systems, backdrop/poster, floor cover and even digital signage. By having an alignment between the IT elements and vicinity elements a sense of "invisible wall" for personal space can be created. Meanwhile the remaining areas of the physical store can still be explored by having other design themes.

The installation of IT should be with the screen facing outward area of the store; the backside of the screen is facing the inside part of the store. This way during interactions with IT, the user would be able to experience the physical domain elements. Ideally some highlight merchandise is visible or within the scope. Consequently the user would be able to switch frames and attain dynamic experience. These recommendations derived from the findings and core concepts, namely *split domain*, *beyond the digital frame, situatedness* and *dynamic experience* respectively.

Device

The basic look of the IT should be as close as possible with quotidian personal and/or home devices, such as tablets and smart TVs. The likelihood of relevance tends to be higher this way. The IT can still be decorated or art directed however. As long as it is not over decorated. Maintaining familiar look is key. With this, the users can be more intrigued as well as feel more familiar in using the IT.

In terms of the size, medium size screens are likely more effective in increasing smooth interactions. The proposed approximate size is not more than two third of the average people's height. This size affords the users to maintain exposure of the interactions. Performativity is central here. The users may be comfortable to show how they use or what is on the screen. Yet they prefer more control by having the possibility to shield the screen with their body to minimize public visibility. The core concept *dynamic experience control* and; the subthemes *physicality* and *beyond the digital frame* fuel all of these actionable insights.

Content

The most imperative thing for the content design is to be selective. The main idea and visual should be the one being prioritized or highlighted in the advertising and marketing promotion at the time. For instance, even for e-commerce (product-centric type IT), what can be purchased from the IT should be the selected ones, thus unlike the website. An extension of a highlighted promotion visible in the physical store can also be one idea for experience-centric type IT. Or perhaps further, having an exclusive content that cannot be found on the physical store but can be only experienced on the IT.

While most of the elements on IT screen are expectedly interactive, some details are best to be ready present; providing selected specific information that is regarded as important thus the users do not need to find it. One of the strongest examples is to provide a micro/zoomed image of merchandise texture, showing its fabric. Another is an autoplay film or product rotation. This way the users do not need to manually interact/navigate with the merchandise. It can also avoid overlooked information.

The use of model as part of the content has been proven to be effective in increasing aspects, such as perceive quality and trust as well as experience. It would be best however to focus on the use of unknown model. The user can relate better and can mitigate experience bias (which often happens with popular or known model).

The graphics for navigation tool can be designed outside the usual shapes. Users tend to expect graphic innovation, not only do they have the ability to recognise navigation graphics, but they are also more keen to use innovative navigation tool shapes. This implies that innovation is not always about the technical aspects of the technology (for example, the kinect sensor system). It can be achieved via a digital graphic design. All of the content recommendations derived from the findings and core concepts, namely *split domain* (mainly *within the digital frame)*, *digital domain merchandise, interactive information, interaction moments*; and *dynamic experience* and *challenges for experience* respectively.

5.6 RESEARCH LIMITATIONS

This thesis is not without its limitations, which relate to the secondary research and methodology. First, regarding the use of conference proceedings and non-academic online media for secondary research. Literature on experience with interactive technology, especially public technology (IT) in fashion stores, tends

to be limited. Thus, for reviewing the aspects of public technology, the researcher tended to rely on conference proceedings and non-academic online media sources for reports that may have a less rigorous research approach.

The second limitation concerns independent data collection and manual analysis. Rapid ethnography, the research strategy, notes that the methods for collecting data ideally use multiple researchers for management and implementation reasons. By having a team of researchers, the data collection process can be organised and managed more efficiently (Pink et al. 2013). Other than that, the use of computer or specialist software to aid the analysis of data has been suggested (Millen 2000). Neither of these approaches were applied. The former however, was resolved via sketch observations to help capture important actions and acquire data. Thus the researcher was able to use another method to independently conduct the data collection.

Regarding data analysis, the researcher has undertaken manual coding and categorizing analyses. To include the two suggested technique for applying rapid ethnography, they can possibly increase the quality and efficiency, of both the data and analysis process.

5.7 FURTHER RESEARCH

Future research directions arising from this project could extend the application of the UXD approach to other types of interactive technology, beyond physical touchscreens, in fashion stores. For example, it could be applied to studies of augmented reality or virtual reality systems embedded in-store that can be integrated with personal devices. A related application is to assess the use of innovative technologies such as holographic displays in stores but also in other places and spaces, such as museums and cultural centres.

A second direction is to extend research on IT in fashion stores that develops the UXD theoretical framework as the lens for explicating the research as methodology, data collection and analysis. For example, to consider its use with theory of embodiment that concerns the consumer's being, living, feeling and bodily entity situated in the physical world rather than their internal psychological state.

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APPENDICES

APPENDIX 1
Units of meaning

THEME 1

SPLIT DOMAIN	
Units of meaning	Excerpts sample
The users can see two domains/worlds	[…] so graphics here, the real thing there […]
	[…] oh they wanted to make similar style [digital design theme] I think with the surrounding […]
	[…] the promotion [physical posters] is shown more here [IIT] […]
The users can jump/oscillate between domains	[…] it's about the new product. The actual product is visible. But not that golf thing. Let's see. Nope it's specific about this one only […]
	[…] one of the benefits I guess. I can check directly in the store while I'm using this […]
	[…] I saw one that looks like this over there [pointing at shirts and t-shirts rail]. Can I go there just to check?
The feeling of active and intense	[…] the graphics, movement, the sound, what's happening around me. Everything affects me instantly […]
	[…] it can be a little too much. People may use it once or twice. But it's really stimulating […]
	[…] I feel different. I suppose a bit weird, being here in the middle of the store, using the screen, but I still can manage, wanna know more […]
The feeling of in the now (high alert and embodied)	[…] just select this. Oh people are looking at me [laughing] they're curious […]
	[…] if I want to I can always stop and come back later. I just don't want to block the way or anything […]
	[…] films again. It's interesting. I can see it while standing here and you know kinda enjoy the moment […]

WITHIN THE DIGITAL FRAME – split domain's subtheme	
Units of meaning	Excerpts sample
The users can see digital as a whole and micro	[…] pretty much the same design. The store, well some attributes, the mood of the background, the buttons, images […]
	[…] everything is in modern style, but the texts are still readable […]
	[…] dark tone, feels high-tech. The sharp edges of these [point at a graphic], working together perfectly […]
All graphics are important, not just the navigation ones	[…] not so complicated. The separators [low opacity grid] make it easy on the eyes […]
	[…] these graphics are pushing the product out, very tribal (style of graphic) and strong. So even it's just a t'shirt it became bold […]
	[…] I like the borders. Because the background is dark grey, other information on top of it can be more visible […]
About art direction. Flat style is liked more	[…] the image is clear. IG [instagram] style [laughing] […]
	[…] I'm just looking at the sweats. Would be great if I can see it not being worn […]
	[…] it's ok. I'm convinced because of the front and back visuals […]
About art direction. Graphics and images can be complex but the attention is towards the simplest ones	[…] how to go back? [found a left pointed triangle on the top left corner] Right scroll here […]
	[…] it's good to isolate the background so I can see the details […]
	[…] many options but the buy now it's quite simple […]

BEYOND THE DIGITAL FRAME – split domain's subtheme	
Units of meaning	Excerpts sample
The users tend to connect nearby elements with the content on IIT	[…] I think this menu [graphic style] matches the line stickers on the floor […]
	[…] It's the pride identity [a rainbow visual] just like the things decorating the [physical] store […]
	[…] The size, and the rim is metallic black, blended with the wall, suit the others [physical atmospherics] really well. It's cool and hi tech […]
Other elements within the scope affect the interactions	[…] I can proceed here. Or should I pay there? [at the til] […]
	[…] is it raining? Good thing it's bright [hard lighting] inside […]
	[…] maybe connecting it [IIT] with the social media wall over there can be fun […]
Other people affect the interactions	[…] I hope I'm not blocking the way […]
	[…] people are busy looking around. Some were looking at me. Curious? […]
	[…] that guy [staff] keeps looking at us […]

THEME 2

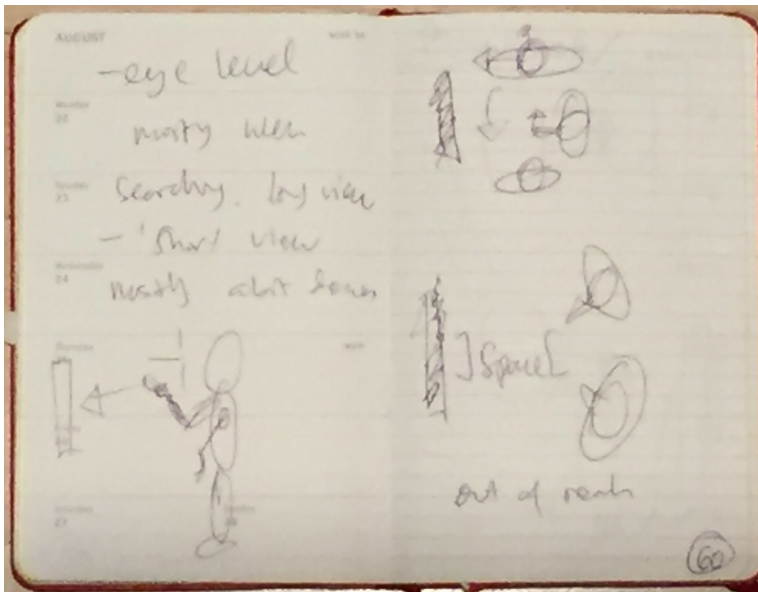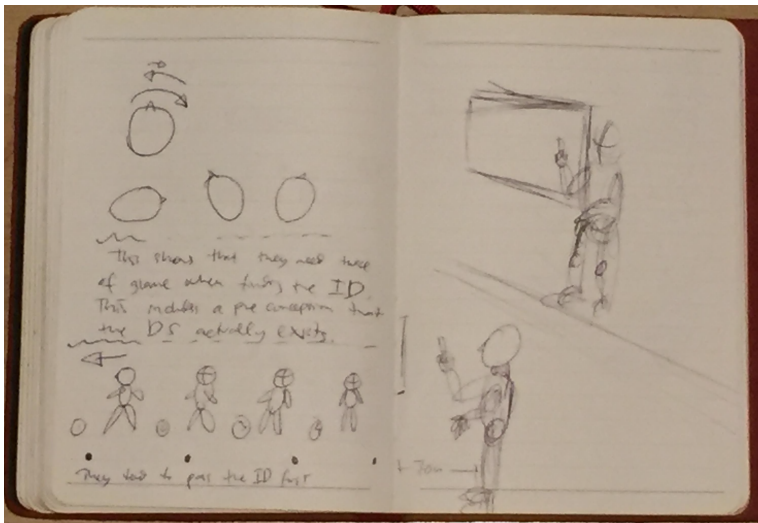| DIGITAL DOMAIN MERCHANDISE	
Units of meaning	Excerpts sample
Merchandise is always prominent	[…] the quality of the pictures, they are amazing. The colour of the outfit is bold…stand out […]
	[…] quite creative logos. But are the t-shirts come only in white? […]
	[…] the design is a bit dark…oh this is nice [stopping and looking at a shoe on one large window menu][…]
Featured merchandise is more intriguing	[…] from the very beginning this customising thing is already shown […]
	[…] I'm confused [with the logo options] maybe I can find the one that looks like this [stopping and looking at a floating logo design]. Let's see where it is […]
	…] not complicated, not too many choices. Just about it so I can just look at these more […]
Want to see merchandise in detail	[…] it's just a short film. I couldn't find the product anywhere […]
	[…] looking at the fabric composition. I don't like cotton poly. Ok it's pure cotton […]
	[…] just swiping back and forth. I want to see the… right, shape is cool […]

DIGITAL MERCHANDISE DETAIL – digital domain merchandise's subtheme	
Units of meaning	Excerpts sample
Details of the merch are important for many things	[…] design is just design sometimes but what makes it different is the small things […]
	[…] you can see the detail of the shoe here… very detailed, as if it's the real texture […]
	[…] now I know the specifics, I might buy it […]
Some details of the merch should be shown/provided	[…] good it's provided, won't know otherwise […]
	[…] another image is showing the fabric's technology […]
	[…] maybe some shots of it without zooming? […]

DIGITAL MERCHANDISE MOTION – digital domain merchandise's subtheme	
Units of meaning	Excerpts sample
Interacting with the merch is important	[…] I'm zooming this [shoe]…right, I can also rotate it. This is good so I can see every angle […]
	[…] gonna click the t-shirt [image] now… to see the shape…maybe it's slim fit […]
	[…] besides the video maybe showing the details [tapping] no not working […]
Some motions of the merch should be shown/provided	[…] next…oops ok it's playing [intrigued] […]
	[…] I think the slow mo(tion) [autoplay video] is fantastic… because it's very smooth and not clanky […]
	[…] I'm expecting a demonstration, you know like [naming a brand's website] […]
Simple motions are associated with ease of use	[…] just going to do something, [double] tapping like on my phone. Zoomed now […]
	[…] whoops how to do this? [rotating] Sorry a bit stuck here […]
	[…] just zooming and moving I guess. It's not like playing a game or something […]

APPENDIX 2
Samples of data

APPENDIX 2 – Samples of data
(observation sketches & notes)
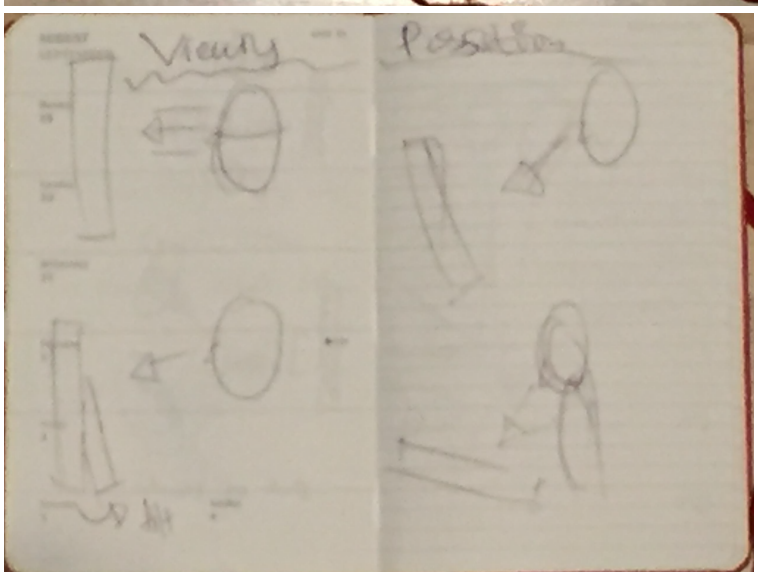
APPENDIX 2 – Samples of data
(protocol analysis & interview)

Participant 27

Ok we're in NikeTown now. And I'm asked to express my feelings …and thinking about the technology and store.

So…I can do anything I like can't I?

Quite busy as you can see…People are going around. I can see mostly are just browsing. It's a bit dark but with many ambient lights.

Ok so I need to find the technology!? *(interactive display)*

yes interactive display sorry [looking around and missed the display on the first look]. Hmm I think it's that one?

(what do you think? Is it that?)

Yeah so let's just go there. [walking towards the display]

[from about 5 meters] yeah that's it. I can see that kid touched it [a teenage boy about 12 touched the display, swipe it, looked for about 5 seconds, left before we are there]

Alright…Let's do this. Umm…*(just report everything you feel and think and do)*

Right…I'm touching the display now and it shows a bunch of guy with athletic outfits. Touching it…oh [not clickable then click another area which was also not, stopped clicking and then started swiping the page] Ok I'm moving on…I can see a pair of shoes, nike obviously. It shows the product in detail

(what detail?)

it actually micro zooms some parts of the shoe… like this the heel with an air system [reading the copy] oh new technology I think. It covers the whole part of your feet…[brief silence, seemed interested, reading and clicking]

(what do you think and feel?)

Yeah so it's…just like I said before…it shows the detail of the shoe…umm I think it's informative…nice visual ..I think it's super HD [High definition] They [Nike] are always amazing with visuals, I've seen some adverts online and they were amazing. *(do you think the adverts you saw look similar to these?)*

yeah…yeah…I can't explain it but It's like they've got the same feeling? Tone? I don't know I'm not an art guy…

(it's ok, you explained it really well, so what sort of tone?)

it seems a bit …you know like great lighting and texture…great photography…like …[because we were just talking near the display, all of a sudden someone stepped in and used it, we move aside to discuss further]

(So you were saying? Great photography and?)

yeah …umm what was that [laughing a bit] yeah fantastic…so real I think. And…yeah just amazing I don't think I can describe it technically

(that's fine, any other things that attracted you visually?)

yeah the whole package is amazing. Oh that guy is leaving…should I use it again? *(yeah let's)* [he started touching again] [swiping 2 cycles before stopping]

there's also video here…not sure about the story but again visually it's amazing. *(what is it about?)*

[he watched the short video for about 30 seconds] it's more to some athletic moves…but looks artistic *(why do you think so?)*

maybe because it's going slowly and quite dramatic like those … yeah artistic…

umm let's see. I think…yeah I think these are all promotion and information

I think it's ok

(if you can expect something, what would it be?)

you mean from the adverts? [using the word adverts rather than display] I think it's just about right…but maybe it could provide a different story about nike

(what do you mean by that please?)

so maybe longer video…showing things that aren't here [in the store]

(would you like it even better ?)

yeah I suppose so.

(ok so how do you feel now?)

what you mean in general? Yeah ok.

(you don't mind using it ?)

No

(being here in the store and everyone can see you using it)

It's ok…that's the point of having it here isn't it? It's adding the feeling of the store

(feeling?)

yeah you know looking hi tech and all that.

(is the display ok? Size, positioning etc.)

yeah it's massive and visually attractive. Umm in roomy space should be better

(you mean it's not convenient here?)

it's strategic but look very tight…people can barely pass. And some are trying shoes here [pointing to the sitting area]

(but apart from that, you're ok?)

yeah I don't mind…if I'm interested I would just use it. Don't care about people. Don't know If I will keep using it though [laughing]

(ok so what would make you using it longer?)

umm if it shows more interesting adverts I suppose. More films…or if I need something I can find it there…or pointing out to where a product is located. *(anything else?)*

No, I prefer going to the till…if something happened it can be sorted quickly [laughing]

(ok what do you think about the interactivity?)

it's ok…not bad.. just used it like whenever I'm using my phone

(can you tell me more please?)

[we moved again because it got busy in the area, moving to the foyer area] ah better.

(so you were explaining about the display being the same like your phone?)

yeah yeah…well not the same, but they way I use it. Click…scroll..

(so in terms of the navigation yes?)

yeah

(and do you think it feels the same?)

No not really…it's larger obviously…and …not very responsive

(how do you mean?)

you know when you tried scrolling ..it just stuck? [trying to explain how it went with movement] you know…ok let me get my phone here [showing how he moved his thumb and the page scrolled accordingly]

(I see, so the display was a bit unresponsive to your touch?)

yeah yeah…

(ok any other comments? Anything about the display…store…)

I think just keep changing things? You they do have themes…so if you can just get along with it I think it should be fine. People would stay interested.

APPENDIX 3 – Sample of ethical clearance checklist

NOTTINGHAM TRENT UNIVERSITY

<table>
<tr><td colspan="4">

JOINT INTER COLLEGE ETHICS COMMITTEE
ETHICAL CLEARANCE CHECKLIST

College of Art, Architecture, Design and Humanities; College of Science and Technology; and the Centre for Academic Development and Quality (CADQ)

</td></tr>
<tr><td colspan="4">

(TO BE COMPLETED FOR **ALL** INVESTIGATIONS INVOLVING PARTICIPANTS)

All staff and PGR students wishing to conduct an investigation involving participants in order to collect new data in either their research projects or teaching activities are required to complete this checklist before commencement. It may be necessary after completion of this form to submit a full application to the Joint Inter College Ethics Committee (JICEC). Where necessary, official approval from the JICEC must be obtained **before** the research is commenced. This should take no longer than one month.

</td></tr>
<tr><td colspan="4">

IF YOUR RESEARCH IS BEING CONDUCTED OFF CAMPUS AND ETHICAL APPROVAL FOR YOUR STUDY HAS BEEN GRANTED BY AN EXTERNAL ETHICS COMMITTEE, PLEASE SEND DETAILS TO THE PROFESSIONAL SUPPORT RESEARCH TEAM FOR CONSIDERATION BY THE CHAIR. YOU WILL BE EXPECTED TO PROVIDE EVIDENCE OF APPROVAL FROM THE EXTERNAL ETHICS COMMITTEE AND THE TERMS ON WHICH THIS APPROVAL HAS BEEN GRANTED.

IF YOUR RESEARCH IS TRANSFERRING INTO NOTTINGHAM TRENT UNIVERSITY AND APPROVAL WAS OBTAINED FROM YOUR ORIGINATING INSTITUTION, THERE IS A REQUIREMENT ON THE UNIVERSITY TO ENSURE THAT APPROPRIATE APPROVALS ARE IN PLACE.
If you believe either of these statements applies to your research, please contact the Professional Support Research Team adbresearch1@ntu.ac.uk with evidence of former approval and the terms on which this approval has been granted.

IT IS THE RESPONSIBILITY OF INDIVIDUAL INVESTIGATORS AND/OR SUPERVISORS TO ENSURE THAT THERE IS APPROPRIATE INSURANCE COVER FOR THEIR INVESTIGATION.
If you are at all unsure about whether or not your study is covered, please contact the Finance & Planning Manager in your Finance team to check.

</td></tr>
<tr><td colspan="2">**Name of Applicant:**</td><td colspan="2">**YURI SIREGAR**</td></tr>
<tr><td colspan="2">**School:**</td><td colspan="2">**SCHOOL OF ART AND DESIGN**</td></tr>
<tr><td colspan="2">**Title of Investigation:**</td><td colspan="2">**CONSUMERS' EXPERIENCE OF TECHNOLOGICAL INTEGRATION IN FASHION RETAIL STORES**</td></tr>
<tr><td>**STAFF**</td><td>☐</td><td>**STUDENT**</td><td>☐**X** (*if student, please complete)</td></tr>
<tr><td>**RESEARCH**</td><td>☐</td><td>**CONSULTANCY**</td><td>☐</td></tr>
<tr><td colspan="2">**Degree Title and Level*:**</td><td colspan="2">**PHD FASHION MARKETING**</td></tr>
<tr><td colspan="2">**Supervisor**

(List Lead supervisor first)</td><td colspan="2">**1. PROFESSOR ANTHONY KENT**

2. DANIEL EASTERS</td></tr>
</table>

	3.

Briefly outline the objectives of the research. [75 words]
- Collecting consumers' subjective interpretation of their interaction with interactive technology in fashion stores
- Documenting how consumers interact with an interactive technology
- Analysing and constructing the data and insights into themes and meanings
- Designing a feasible integrated user experience (UX) framework

Briefly describe the principal methods, the sources of data or evidence to be used, and the number and type of research participants who will be recruited to the project. [150 words]
- The approach is qualitative, with the combination of protocol analysis (think aloud) and go along methods as the strategy to collect the data.
- 5-10 participants (18-34), more female than male, digitally savvy, fashion consumers.
- The data will be in the form of verbal expression (audio recorded).
- Individually, they will be equipped with a clipped audio recorder, and asked to enter a fashion store and use an interactive display with no time restriction, during which they will be asked to express their feelings and thoughts out loud throughout the process. They will be given a cue card, which contains a guide of what to express.
- Researcher will observe but remain non-instrusive

Do you intend to use published research instruments/resources (e.g., questionnaires, scales, psychometrics, vignettes)?

If YES, complete the next 3 questions
If NO, proceed 4 questions NO

Have you included with this application a full electronic copy or link to each published research instrument/resource?

If you are using published research instruments/resources, do you have permission to use them in the way that you intend to use them?

What steps will be taken to ensure compliance with the requirements of copyright rules for the use of published scale?

Are you developing your own research resources/instruments to collect data?

If YES, complete the questions below.
If NO, proceed to the next section. NO

Briefly describe the research resources/instruments you are developing. [50 words]

If applicable, please include an electronic copy of your own bespoke/self-developed research instrument(s) that you will use to collect data with this application.

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A. Familiarisation with policy - Please answer *as appropriate*			
Please confirm if you are fully acquainted with the policies for guiding ethical research named below:			
NTU research ethics policy, and the procedures for ethical approval	Yes √	No☐	N/A☐
The guidelines for ethical research promulgated by a professional association, as appropriate	Yes √	No☐	N/A☐
NTU Data Management Policy	Yes √	No☐	N/A☐
The Regulations for the Use of Computers (*see* NTU website)	Yes√	No☐	N/A☐
Guidelines for Risk Assessment in Research	Yes√	No☐	N/A☐
If you answered **NO** to any of these questions, please note that you must study these guidelines and regulations before proceeding to complete the remainder of this form.			

B. External Ethical Review – *Please answer as appropriate*			
Has a favourable ethical opinion already been given for this project by any other external research ethics committee[1]? An external research ethics committee means any research committee *other* than those at Nottingham Trent University. Submission of this form is *not* a submission to an external research ethics committee.	Yes☐	No☐ √	N/A☐
Will this project be submitted for ethical approval to any other external research ethics committee[2]? An external research ethics committee means any research committee *other* than those at Nottingham Trent University. Submission of this form is *not* a submission to an external research ethics committee.	Yes☐	No☐ √	N/A☐
If you answered **YES** to either of these two questions, please complete section C sign the declaration at the end of the form and submit it (together with a letter confirming ethical approval from the external committee) before starting any research. If you answered **NO** to both questions, please proceed to the next section.			

---

[1] This includes the research ethics committee of another academic institution.
[2] This includes the research ethics committee of another academic institution.

C. Investigators

Do investigators have previous experience of, and/or adequate training in, the methods employed?		Yes☐✓	No**☐
If involved will junior researchers/students be under the direct supervision of an experienced member of staff?	Yes☐	No**☐	N/A☐ ✓
If involved will junior researchers/students be expected to undertake physically invasive procedures (not covered by a generic protocol) during the course of the research?	Yes**☐	No☐	N/A☐ ✓
Are researchers in a position of direct authority with regard to participants (e.g. academic staff using student participants, sports coaches using his/her athletes in training)?	Yes**☐	No☐✓	N/A☐
** If you select ANY answers marked **, please submit your completed Ethical Clearance Checklist accompanied by a statement covering how you intend to manage the issues (indicated by selecting a ** answer) to the JICEC.			

D. Participants

Vulnerable Groups No

Does your research involve vulnerable participants? If not, go to the next section No

If your research does involve vulnerable participants, will participants be knowingly recruited from one or more of the following vulnerable groups?

Children under 18 years of age (please refer to published guidelines)	Yes*☐	No✓
Pregnant women	Yes*☐	No✓
People with mental illness	Yes*☐	No✓
Prisoners/Detained persons	Yes*☐	No✓
Other vulnerable groups please specify: _____	Yes*☐	No✓
Is a DBS/Overseas Police Check required?	Yes☐	No✓
If required, do you have a DBS/Overseas Police Check? *Please contact NTU Disclosures, details can be found on the address book.*	Yes☐	No✓
To the best of your knowledge, please indicate whether the proposed study:		
Involves procedures likely to cause psychological, social or emotional distress to participants	Yes*☐	No✓

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Is designed to be challenging psychologically in any way		Yes*☐	No√
Exposes participants to risks or distress greater than those encountered in their normal daily life		Yes*☐	No√

Chaperoning Participants

If appropriate, e.g. studies which involve vulnerable participants, taking physical measures or intrusion of participants' privacy:

Will participants be chaperoned by more than one investigator at all times?	Yes☐	No*☐	N/A√
Will at least one investigator of the same sex as the participant(s) be present throughout the investigation?	Yes☐	No*☐	N/A√
Will participants be visited at home?	Yes*☐	No ☐	N/A√

If you have selected N/A please provide a statement in the space below explaining why the chaperoning arrangements are not applicable to your research proposal:

I will not use vulnerable groups

If you have selected any of the * answers for any question in section D please provide details (50-75 words):

Advice to Participants following the investigation

Investigators have a duty of care to participants. When planning research, investigators should consider what, if any, arrangements are needed to inform participants (or those legally responsible for the participants) of any health related (or other) problems previously unrecognised in the participant. This is particularly important if it is believed that by not doing so the participants well-being is endangered. Investigators should consider whether or not it is appropriate to recommend that participants (or those legally responsible for the participants) seek qualified professional advice, but should not offer this advice personally. Investigators should familiarise themselves with the guidelines of professional bodies associated with their research.

E. Observation/Recording - *Please answer: yes or no*		
Does the study involve data collection, or the observation or recording of participants? Note that data collection includes the re-use of material originally collected for a non-research purpose (e.g. client or student data already in your possession) and includes anonymous data	Yes☐ ✓	No☐
Will those contributing to the data collected (_or_ being observed or being recorded), or the appropriate authority, be informed that the data collection, observation or recording will take place?	Yes☐ ✓	No☐
If you have answered **NO** to question to the first question in section E, because you are not undertaking empirical work, proceed to the declaration at the end of this form. If you have answered **NO** to question the second question, an application for ethical approval needs to be made to the JICEC.		

F. Consent and Deception - *Please answer: yes or no*		
Informed Consent & Data Withdrawal Will participants, or the appropriate authority, be fully informed of the objectives, and of all other particulars of the investigation (preferably at the start of the study, but where this would interfere with the study, at the end)?	Yes☐ ✓	No☐
Will participants, or the appropriate authority, be fully informed of the use of the data collected (including, where applicable, ownership of any intellectual property arising from the research)?	Yes☐ ✓	No☐
For detained persons, members of the armed forces, employees, students and other persons who may not be in a position to give fully independent consent, will care be taken over the gaining of freely informed consent?	Yes☐ ✓	No☐
If your research involves children under the age of 18 or participants who have impairment of understanding or communication:		
- will consent be obtained (either in writing or by some other means)?	Yes☐	No*☐
- will consent be obtained from parents or other suitable person?	Yes☐	No*☐
- will they be informed that they have the right to withdraw regardless of parental/ guardian consent?	Yes☐	No*☐
For investigations conducted in schools, will approval be gained in advance from the Head-teacher and/or the Director of Education of the appropriate Local Education Authority?	Yes☐	No*☐
For detained persons, members of the armed forces, employees, students and other persons judged to be under duress, will care be taken over gaining freely informed consent?	Yes☐	No*☐
Will participants, or the appropriate authority, be informed of their right to withdraw from the investigation at any time (or before a specific deadline) and to require their own data to be destroyed?		

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Deception		
Is deception part of the study? If the answer is no, proceed to section G	Yes☐	No*☐✓
If yes, please explain the rationale and nature of deception (50-75 words):		
Will participants be de-briefed and the true object of the research revealed at the earliest stage upon completion of the study?	Yes☐ ✓	No*☐
Has consideration been given on the way that participants will react to the withholding of information or deliberate deception?	Yes☐	No*☐

G. Storage of Data and Confidentiality		
Please see University guidance on https://www.ntu.ac.uk/intranet/policies/legal_services/data_protection/16231gp.html. If you are a member of NTU staff you can obtain direct access to this with your staff username and password. If you are not a member of NTU staff, please request of copy from your supervisor or course leader.		
Does your research need to be compliant with the RCUK Regulations. If yes, please attach your data management plan (please use dmponline.ddc.ac.uk to design your plan based around the funders requirements, if you have any queries please email: ResearchDataManagement@ntu.ac.uk).	Yes☐	No☐ ✓
Will all information on participants be treated as confidential and not identifiable unless agreed otherwise in advance, and subject to the requirements of the law of the relevant jurisdiction?	Yes☐✓	No☐
Will storage of data comply with the Data Protection Act 1998 and the law of any non-UK jurisdiction in which research is carried out?	Yes☐✓	No☐
Will any video/audio recording of participants be kept in a secure place and not released for use by third parties?	Yes☐✓	No☐
Will video/audio recordings be destroyed within six years of the completion of the investigation?	Yes☐✓	No☐

Incentives		
Have incentives (other than those contractually agreed, salaries or basic expenses) been offered to the investigator to conduct the investigation?	Yes**☐	No☐ ✓
Will incentives (other than basic expenses) be offered to potential participants as an inducement to participate in the investigation?	Yes**☐	No☐ ✓
** If you select ANY answers marked **, please submit your completed Ethical Clearance Checklist accompanied by a statement covering how you intend to manage the issues (indicated by selecting a ** answer) to the JICEC.		
The design of the participant information sheet/consent form and of any research instrument (including questionnaires, sampling and interview schedules) that will be used, have been discussed with my supervisor(s). Yes		
Compliance with Ethical Principles		

If you have completed the checklist to the best of your knowledge and selected an answer marked with * or ** your investigation you will need to seek full formal approval from the JICEC.

Please return to completed Ethical Approval Checklist with the following documents as necessary to the Research Team, Arkwright 204, City Campus, or via email adbresearchteam1@ntu.ac.uk:
- A copy of the research tool you are using
- Consent Form (if necessary)
- Data Management Policy (if necessary)
- Risk Assessment (if necessary)

Please note that the ethics form does not abrogate your need to complete a risk assessment

Declaration I have read the Ethics & Governance Statement http://www.ntu.ac.uk/research/research_at_ntu/research_integrity/index.html. I confirm that the above named investigation complies with published codes of conduct, ethical principles and guidelines of professional bodies associated with my research discipline.	
Signature of Applicant (Research Student or Principal Investigator) Date 5 July 2016	Yuri Siregar
Signature of Supervisor/Line Manager (Director of Studies/ATL) Date	
Signature of JICEC Chair Date	