The Digital Signage Technology (DST) & The Waiting Experience:

A Case Study of an Alberta Health Services' Clinic

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ABSTRACT

Digital Signage Technology (DST) is a platform used by a variety of waiting environments, including healthcare settings. The waiting experience in any setting is influenced by the physical attributes of its waiting environment. In the healthcare context, little is known about the specific application of DST as a communications and technology platform for providing 'the waiting experience'. This case study explored a real-life waiting situation and discovered the waiting experience in a setting with DST. I conducted a field observation and a survey questionnaire to gather information from visitors to know their involvement in, attention to, and perception on 'the experience' and 'the DST' of a clinic's waiting area in Edmonton. Using qualitative description, findings and analysis implied that DST enhances visitors' waiting experience, reduces visitors' waiting anxiety, and influences visitors' education. It was further inferred that: (1) adding digital technology in a healthcare environment makes it 'comfortable' and 'friendly'; (2) the waiting experience is linked to cognitive and emotional experience; and (3) visitor experience demands 'interactivity' of DST. Limited data was gathered; this research provided initial insights into the role of DST in healthcare settings, and more work will need to be done. Meanwhile, variables like visitor traffic, communication content, and audience engagement may be considered for future research. This study did not aim to produce generalizable results for the overall healthcare field but its research design, strategy, and framework may be used to guide future case studies and future research with larger sample size.

Keywords: *DST, waiting experience, DST in healthcare, healthcare communications, healthcare technology, healthcare waiting environment, waiting anxiety, experiential dimensions*

DISCLAIMER

The views expressed in this capstone project are those of the author and have no reflection on the official policy or position of Alberta Health Services, the University of Alberta, the Faculty of Arts, or the Master of Arts in Communications and Technology program.

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CHAPTER ONE: INTRODUCTION

The act of waiting is becoming common to the daily lifestyle of individuals and to their

human experience — anticipating your ordered food to arrive on your table, hanging around a

transport terminal for your next destination, standing in line for payment in the cashier of a

grocery store — those of which imply that a person's waiting experience is influenced by how

the environment looks and feels. With regard to waiting in a healthcare environment, it has no

different story. However, this setting has areas wherein 'the experience' tends to vary depending

on the nature of a certain facility since it can be an emergency room, a clinic, or a consultation

lounge, to name a few.

Deciding on which physical attributes fit the environmental design of a specific waiting

area in a healthcare facility is crucial for the overall healthcare experience (Gabutti & Cicchetti,

2017; Underwood & Rhodes, 2018). In other words, it is essential for healthcare organizations to

provide better visitor experience (Lang, 2012) through their waiting areas. Having said that, the

challenge for a healthcare environment to enhance the 'experiential consumption' (Argenton,

2015) of its audience relies heavily on determining the appropriate communication strategies.

That means, to address this experience-communication challenge, there has to be a complete

understanding of how to communicate the 'healthcare experience' for a complex and diverse set

of healthcare waiting audiences.

The field of communications and technology is now being used to fill healthcare

communication gaps (Lupton, 2014); as waiting activities are usual in a healthcare setting, a

communication strategy used is the installation of Digital Signage Technology (DST) in the form

of digital signage screens. Waiting environments such as in healthcare facilities currently use

DST for customer/ visitor communications. However, little is known about how implementation of DST should be done in different ways. In other words, the context of healthcare waiting experience should acknowledge that there is a variety of communication needs to be addressed since a healthcare facility may have multiple waiting areas with different audiences.

In this chapter, I explain the purpose of conducting a case study of a healthcare facility, and articulate an informed research question based on a review of the literature in this field. A preview of the key areas discovered from the literature review, as well as research limitations, is also discussed in this chapter. An overview of the research methods together with the significance of the study is also included in this chapter.

1.1 Purpose of the Study

The purpose of this study is to explore two key concepts: Digital Signage Technology (DST) and the waiting experience. In particular, the objective is to put the two aforementioned concepts into context of a case study. The research question for the case study aims to discover the digital signage experience of visitors inside the waiting area of a chosen healthcare facility. I want to know the level of attention paid by the visitors, the kind of involvement they share, and their general perception of the digital signage experience while waiting.

Existing literature points out that healthcare settings have varying waiting experiences; there is an opportunity to determine and examine an existing healthcare facility's strategies of using digital signage technology for covering communications and experience as attributes for a healthcare waiting environment. Little is known about the specific use of DST in healthcare; my study adds a modest contribution to the literature that talks about DST in healthcare context.

This case study, however, has limitations with regard to the scope, the analysis, and the data collection method. Moreover, visitor traffic, communication content, and audience engagement are just some of the other variables that may be considered for future research.

This case study is exploratory in its approach. As such, it makes no attempt to generalize results to healthcare as a general field. However, the research design, strategy, and framework may be used as templates for further case studies of facilities internal to the chosen healthcare organization, and for future research efforts in a larger-scale sampling.

1.2 Preview of the Literature

The fields of healthcare and technology are weaved together; the former uses the latter as a tool for many functions including environmental experience. Specifically, existing theoretical concepts explain that waiting experience inside a healthcare setting is influenced by many factors, including technology as a vital part of its environmental design.

I review literature covering the two fields mentioned by locating articles under five particular areas: (1) overview of using digital technology for customer experience; (2) digital technology and its strategies in various settings; (3) the 'experience economy' and healthcare customer communications; (4) the waiting experience and the psychology of waiting behavior in healthcare settings; and (5) the science behind digital technology.

In retrospect, findings in the literature review imply that 'communications' and 'experience' are components in the healthcare-technology fields that function together; this contributes to the growing literature of applied communications technology in healthcare. Meanwhile, this case study unpacks a discovery that features the connection of

'communications' and 'experience' in the areas of behavioral and applied science where communications technology is involved in a healthcare evaluation.

1.3 Preview of the Research Methodology

The research design for this study involves theoretical and operational frameworks. Theories and concepts in the 'Experiential Dimensions' or the experience economy, the concepts in phenomenology, and the concepts in grounded theory are combined to inform the study's operational framework. The operational framework expands the research question into three categories: (a) knowing the kind of involvement healthcare visitors are doing while viewing the digital signage; (b) identifying the level of attention paid by healthcare visitors in viewing the digital signage while waiting, and; (c) determining healthcare visitors' perception about their digital signage experience.

As for research strategy, this is an exploratory study that uses qualitative description to examine the above categories and build on the 'case'; using case study method, purposive sampling is facilitated and data gathering includes field observation and survey questionnaire. Research procedures and ethical considerations include an approved ethics application from University of Alberta's Research Ethics Board, and an administrative approval from the chosen healthcare facility.

To interpret and analyze the data, I use qualitative analysis in an inductive reasoning approach. I use this approach in order to unitize, categorize, and theme the data for establishing key results areas. The scope of the project and the data collection method are limited, thus, quantitative analysis and statistical procedures are not employed for the case study.

1.4 Summary

This study explores the experience of the healthcare visitors in terms of their attention to, involvement in, and perception of DST in the healthcare waiting setting.. The concepts of 'waiting experience' and 'Digital Signage Technology (DST)' are put into context using the case study approach. As the literature suggests, the application of digital technology in the environmental design of a healthcare setting is important to a visitor's waiting experience.

In order to contribute to the existing literature in the fields of healthcare, communications, and technology, I conduct a case study of a healthcare facility in Edmonton, Alberta. I use qualitative description for my research design and facilitate field observation and survey questionnaires for data collection. Data interpretation and analysis are done in an inductive approach.

The overall report on this case study includes the literature review that discusses five different topics in the healthcare, communications, and technology field, the research design and methodology explaining the procedures done for the study, the discussion of the findings gathered from data collection, and the conclusion that explains research limitations and future direction.

The next chapter features the set of literature that broadly explains the waiting experience and the Digital Signage Technology, and how analyzing the literature informs the research question of my case study.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

My capstone research topic explores two concepts: the Digital Signage Technology (DST) and the waiting room experience. This chapter aims to provide a literature review that supports my research topic highlighting digital signage communications in healthcare.

In order to provide context on my research topic, I gathered existing literature that covers the DST as a general concept and the waiting experience in healthcare and non-healthcare settings. The next few sections will explain the search strategy I used in terms of organizing the literature I collected, the review of the literature categorized into five different topics related to my research topic, an analysis of the information from each of the topics from the literature review, and a summary discussion of the literature review and how it informs my research question.

2.1 Methodology of Literature Search Process

Most of the existing literature I collected for my research topic involved three specific fields: psychology, digital technology, and communications. Focusing on these fields, I used a strategy in which I narrowed down the search process into five particular categories: (1) an overview of using digital technology for customer experience; (2) DST and its strategies in various settings; (3) the 'experience economy' and healthcare customer communications; (4) the waiting experience and the psychology of waiting behavior in healthcare settings; and (5) the science behind digital signage screens and the visual, cognitive, and emotional experience.

These five different categories build on exploring why a healthcare setting is taking advantage of the use of digital technology for its communications. The intention is to elaborate and to locate varying perspectives on the application of DST in healthcare and non-healthcare

contexts.

I limited my literature search into a maximum of 50 sources, which are academic or scholarly articles published in online-offline journals, scientific and business papers databases, and academic libraries. I gathered sources dated from the year 2000 until 2019; the majority of the papers I collected range between the year 2010 and year 2019 and the rest were only included for historical and theoretical context of the research topic.

There is an equal balance in terms of the number of gathered literature that use case studies, literature review, and exploratory studies as study approaches. In general, most of the articles used deductive reasoning in placing the arguments they use, and a mix of descriptive and analytical in terms of academic writing. The next few sections of this chapter detail the five categories each with my evaluation of the literature text.

2.2 Literature Review

2.2.1 Overview of Using Digital Technology for Customer Experience

This first section of my literature review provides a general overview of how digital media is being used as a tool for providing customer experience in various settings. I aim to determine the advantages and the disadvantages of using this tool to identify the positive and/ or negative impact of digital media technology into customer experience.

Dey et., al (2015) write a paper about how digital technology shapes the way government services implement strategies for customer experience; by conducting a case study, the researchers found that using digital technology for facilitating government initiatives have positive outcomes for customer relationships such as reduced service requests, more proactive work, and quicker response times. Their case study was focused on determining perception gaps in line with providing better government service; however, the paper lacks evidence on the cons of using

digital technology especially in terms of user experience (government employees/ staff). Despite this, the study still covered digital customer management as an effective way to improve customer service and experience.

Resonating the above study is the communications principle of a scholar who writes a paper about the evolution of media consumption through the digital age. Sparviero (2019) is a scholar that claims digitalization of both media production and distribution has changed the relationship between producers and consumers by making the former able to recognize media engagement and involvement of the latter. As Sparviero (2019) points out, the advent of business models integrating new media environments (digitalization) has increased the interest in the value of co-creation, interactivity, and brand experience. One of the key arguments in the paper states that consumers create value for themselves by building a relationship or personal perception towards a brand experience/ or a product and service.

In other words, this expands on how content strategies implemented through digital media could be the main factor in developing better customer experience. This relates to my research as to how a digital environment adapted by stakeholders could reflect digital and/ or customer experience in a healthcare setting.

For example, business marketers Foroudi et., al (2018) explore the effects of smart (digital) technology on customer dynamics and experience— the authors explain that the increase in digital technology usage supports behavioral effects on individuals through the lens of customer dynamics and experience. With a mixed-method research of an explanatory and convenience sampling, the researchers found that customer behavior is influenced by the technological environment with the result of improved participation such as human learning. The study concluded with an implication that it reflects the mixture of innovative technologies and customer experience and dynamics. This makes a good evidence that customer experience (in context of

human behavior) could be enhanced when environmental design has a feature of digital technology.

Technology innovations such as augmented reality, smart service technology, and virtual reality are starting to surface in the field of digital communications particularly to be visible in customer experience context. According to Kabadayi et., al. (2018), the key characteristics of engagement between a person and digital technology (intelligence, anticipatory, and adaptability) affect perception on a positive customer service, and thus enhance participation of individuals in acquiring "experience".

The former gives a concrete concept of digital experience and how this concept relates to influencing a positive customer experience. However, the paper could have expanded on the specific use of service technologies (i.e giving examples of devices used) in order to detail an actual application of the digital experience. Meanwhile, it made a good point about revolutionizing digital experience through service technologies; it could be one of the directions to providing better customer experience in other environments/ settings.

Meanwhile, I found a study written by Majra et., al. (2016); they discuss in their paper the importance of using self-service technology (SST) to support customer experience in the airline setting. SST is a digital technology that is an automated-device; some examples of SSTs are digital screen kiosks, payment machines, and ticketing booths. The researchers measured traveller experience into dimensions (sense, feel, think, act, and relate) and evaluated SST based on its effect on customer experience. They found that 'customer experience' is highly influenced by the use of SST, in such that perceptions of better customer service is affected by environmental reinforcements like SST. The study relies on predetermined evaluation measures, hence the data analysis highlights empirical evidence; however, this study does not include qualitative considerations. Nonetheless, this provides a good foundation to my research topic touching on

(digital) customer service as a main factor for better customer experience.

On the other hand, Lupton (2014) explains that digital media is being used by the healthcare industry to measure and evaluate patients' experience, particularly patients using digital platforms and devices to inform their opinions of a healthcare experience. The paper suggests that 'digitally engaged patients' create a new phenomenon that is 'digital patient experience': patients' experiences of illness and medical treatments and their opinions on healthcare are becoming digitized and thus being monetized for service improvement. For example, the healthcare industry uses digital platforms to involve their patients with medical research, clinical consultations, and preliminary online medical examinations. Lupton's paper has an implicit argument about how digital media tends to capitalize on human experience; however, the paper fails to include whether this directly affects the healthcare experience of the patients themselves.

All these sets of literature boils down into how digital technology, it being a platform for communication, can influence the implementation for customer experience strategies. I found that the above papers discussing digital media for customer communication highlighted customer experience as a key component for measuring media advantages. However, there is a lack of information about the specific strategies and functions of digital technology across various settings.

In the next section of my literature I explore DST as a core digital technology platform in different settings, including healthcare.

2.2.2. DST and its Strategies in Various Settings

This section introduces a set of literature that discusses a general overview of DST and how it is applied in different environmental settings. I found that DST is a digital platform that serves as a communication medium for organizations to connect with their customers. The next few parts of this section expound on the specific functions of DST in its three application points, and how each

of them use DST to provide an improved customer experience.

Various settings require different communication strategies as these are envisioned to strengthen the relationship between a brand or a product and its target market. Kelsen (2010) suggests that DST is typically deployed in three situations: (1) Point of Sale (POS) or where a call-to-action (i.e. buying decision) is expected from an audience which is seen inside a mall or a shopping environment; (2) Point of Transit (POT) or where screens display active and valuable short-burst contents in fast-paced environments like airport terminals and train stations; and (3) Point of Wait (POW) or where people spend time long enough to view content flashed on the screen such as in reception desks or waiting areas.

First, for DST screens visible in a Point-of-Sale (POS) situation, the strategic placement and the content of digital signage are both expected to result in profit or sales. For instance, research and psychology academicians Dennis, Newman, Brakus, and Tiu (2010) draw on hypothesis testing using a quantitative approach to measure the positive effects of DST screens in the shopping behaviors of mall goers. These scholars rely on Environmental Psychology[1] and Elaboration Likelihood Model (ELM) of Persuasion[2] theories— DST screens are used to manipulate shoppers' behaviors by stimulating a positive atmospheric stimulus; DST relays content or information that triggers a person's mood to shop (central route of ELM) and indicates a positive or an entertaining shopping environment to let people spend more money (peripheral route of ELM).

In line with the above study, I found another quantitative research that explores the effects of DST content flashed on screens in a customer's perceived experience. Dennis et., al (2014) discovered that customers acquire digital images or videos through their affective experience

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[1] theory introduced by Willy Hellpach in one of his books titled 'Geopysche'; this theory explains how extreme environment affect change in human behavior and attitudes (Pol, E., 2006)
[2] theory introduced by Petty & Cacioppo in 1986 explaining that human beings process persuasion stimuli into two ways (central and peripheral routes)

(entertainment and pleasure) as compared to customers acquiring text-based digital content through cognitive experience (intellect and knowledge learning). The said research leans towards justifying that DST evoke specific experiences— aesthetically pleasing graphics influence customers' "entertained" behavior and informative text-based messages influence customers' "learning" behavior.

Moreover, the studies I mentioned above resonate with the literature review and case study conducted by Zolkifly and Hussin (2017) claiming that a DST screen's content, placement, size, and interactivity are vital factors for a customer's purchase decision; digital displays influence a positive environmental experience for customers and thus resulting to individuals embracing emotional and/ or affective behavior response.

In other words, DST screens in a POS situation explains that the platform influences positive behavior to individuals, and human digital exposure has an implied effect on cognitive, affective, and emotional experiences. Meanwhile, Dennis et., al (2010), Dennis et., al (2014), and Zolkiifly and Hussin (2017) lacked in clear explanation and evidence as to whether the positive influence of DST screen directly results to individuals to 'purchase' something, and which digital signage experience (emotional, affective, or cognitive) triggers an individual to decide for purchase.

Despite this, however, all their research provides a good context on how DST in a POS situation can influence direct and indirect environmental experience, that of which is pivotal to my research topic.

On the other hand, the second DST point— Point-of-Transit (POT)— explains how the platform is used to communicate and engage with a moving audience or target; the primary audience of these locations are considered as people-on-the-go[3] (Kelsen, 2010), and are individuals

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[3] people who are moving (i.e. walking, jogging, etc), riding a public transportation or any moving vehicle

who have little to no time in spending watching a DST screen.

Some studies look at DST and its use in busy and fast-paced transportation environments such as in the airports; they attempt to understand how digital displays are used to improve customer service quality and better customer engagement for travellers. For example, according to Jaffer and Timbrell (2014), DST is used to intervene with customers' tasks inside an airport setting: wayfinding, flight scheduling, or passenger's information processing. Three themes of how DST improves customer experience were concluded: enhancing airport's service quality, enhancing airport's brand reception, and enhancing the airport's customer transactions (Jaffer & Timbrell, 2014). As airports are in a setting with a fast-paced environment, the application of DST in this paper resonates Kelsen's (2010) concept that displaying content in a POT has to be short-burst and has to be focused on flashing a valuable content easily captured by passers-by.

In addition, Ryan (2015) used survey questionnaires as data gathering instruments to discover digital signage as a means to promote internal corporate communications for a railway setting. In her findings, she states that the focus of using digital signage is for employee communications rather than for customer communications; she suggests that DST's content relevance is based on the role of an employee whether he is a field worker (task-based employee) or an office worker (knowledge-based employee). Relying on this implication, DST as a knowledge-management tool requires a specific content strategy in order to match an individual's information needs. However, although the context of her research is internal communications, it still grasps the idea that DST triggers a better (or worse) experience for a person such as knowledge learning.

Simply put, these studies suggest that to catch the attention of customers or an audience who move from one place to another, digital signage screens have to induce short-burst content to establish quick connection with them. Meanwhile, the aforementioned cases could have explained

how installing DST in POT locations can establish customer engagement by letting viewers

beware of the screen. A study by Holler et., al (2009) suggests that mounting digital displays show

no correlation between a passenger's high awareness of the information on the screens and their

fixation time[4]. This field-study has installed mobile eye-tracking devices to determine whether a

customer focuses on the information screen; the results reveal that content on the displays has no

influence on the length of consumers' fixation time.

Yet, it is also pointed out by the same researchers that an eye-tracker can only track

whether a person looks at the digital signage and not track what the person is actually doing to

suggest content recall or recognition (Holler et. al, 2009). In other words, I observe that

identifying whether consumers would actually pay attention and focus to digital signage content is

still undetermined. Thus, there is no correlation between how long someone looks at a DST and

what content he or she might remember from the screen. This matches a good conceptual

direction of my research— this gap may discover whether there is a room for studying what

information or digital content are being retained in human cognition (or emotion) in other settings

such as in a busy healthcare environment.

The environmental design in most healthcare settings is considered as a Point-of-Wait

(POW); this point maximizes the potential of a brand, a product, or a service to engage with an

audience for a longer period of time. DST screens placed in POW settings can be normally seen in

waiting areas such as building lobbies and reception desks— people can dwell much of their time

viewing the digital signage content, that of which contents have lengthy screen time to promote

education and information (Kelsen, 2010).

In reviewing the literature, it appears that research studies concerned with DST in POW

settings focus heavily on health-information management efficiency and customer adaptation. For

instance, Larsson (2015) writes a paper discussing DST as a health-messaging device and as a

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[4] as defined in Holler et. Al (2009), 'fixation time' refers to the amount of time a person spent viewing a digital screen or a monitor

social marketing intervention tool to increase health participation of consumers. She explains in her research that using digital devices to translate a marketing message is an effective way to provide health consumers an informative means to participate in a health program.

Larsson's study is a three-year data gathering effort that concludes DST is effective for delivering health information and influencing people's waiting behavior into joining health programs. In this sense, her work envisions DST as a tool to provide a variety of health promotion messages divided into sub-groups targeted to particular or a specific set of audience. This supports the view that although DST is commonly used to inform the general public, there is an opportunity to explore how to tailor-fit DST content or message based on a specific waiting experience of a target audience.

On the other hand, aside from the use of DST as a health information system, some healthcare environments such as nursing homes and distressed facilities also include DST for patients' positive adaptation to a healthcare environment. For example, utilizing ambient displays[5] that flashes health information usually projected on walls can mitigate a perceived negative or gloomy environment. In a setting such as distressed facilities, DST is used to reinforce community information for certain causes. Mixson et., al (2016) suggest that the feeling of distress in nursing homes could be intervened through digital signage. The deployment of DST was perceived as an important tool to alleviate the negative atmosphere experienced within the environment; this envisions affecting positive change in the environmental behavior of the distressed community by letting the people adapt into a new means of receiving information.

Moreover, Thomas (2018) expands on both Larsson and Mixson et., al works on the use of DST for information dissemination about health. The author claims that the use of DST, along with management in nursing facilities and centers, creates an "environment of learning" for patients. The

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[5] "technologies in order to augment a typical hospital room with smart features that assist both patients and medical staff; allowing the patient to control the environment and interact with the hospital facilities" (Kartakis et.,al, 2012)

author furthers the idea of a health education system in a healthcare setting through which DST enables access to information for the public's benefits. She also highlights that installing DST in a healthcare setting makes health information credible as it translates valuable content to patients and/or visitors.

In exploring DST in POW situations like in a healthcare environment, the previous literature lacked clear explanation on the kind of communication intervention they employed (i.e messaging content that was displayed, period of time, and the like). Also, the arguments could have been stronger if specific examples were cited with regard to the kind of health-messaging content flashed on the DST.

There are similarities and differences among these three DST points that are important to note: POS and POW share the same interest in using DST as a platform to influence an environment with positive atmospherics[6]. On the other hand, both POS and POT use DST as a platform for effective transactional purposes. Lastly, both POT and POW converge in using DST as a tool for customer information and environmental mitigation.

All the three major points of DST have varying implementation strategies; meanwhile, I discovered all of the DST points meet at a core idea: enhancing customer experience through digital tech in place. Given the centrality of customer experience to the study of DST, the next topic of my literature review examines theoretical perspectives on the concept of 'the experience'; in particular, the notion of an "experience economy" and how this phenomenon is visible in customer communications context.

2.2.3. The Experience Economy: Where is Healthcare Customer Communications?

The term 'experience economy' was first coined in 1998 by scholars Pine and Gilmore;

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[6] as defined in Kotler (1973), 'atmospherics' is the term used in business marketing to represent a customer-service- oriented environment; it includes perceived visual, aural, olfactory, and tactile factors in a certain consumer setting

they have written multiple editions of the 'experience economy' and in their most recent paper they explained that the concept has been evolving through time merely because of the ever changing landscape in organizations. Simply put, the "experience economy" emphasizes people's needs to accumulate personal experiences rather than having services or goods provided for them.

Using a thorough review of existing and previous works about the concept, the authors discuss that 'experience' has been demanding major outcomes such as customizing goods, enhancing operational services, monetizing experience, converging digital technology into reality, and transforming human experience (Pine & Gilmore, 2014).

Pine and Gilmore's focus on how 'experience economy' is both supporting organizations to provide better customer service and transforming organizational evaluation measures of customer experience plays a vital role in the context of my research; a key principle organizations should start to look at is the shifting experiential values they engage with their publics, particularly for a healthcare environment. The scholars' work is a great backgrounder on 'experience economy' bringing a strong argument that experience, although an intangible product and/ or service, should be enhanced for better healthcare experience outcomes.

Resonating the above scholars is a philosophical and theoretical analysis of the 'experience'; Argenton (2015) claims that 'experience' branches out to "experiential consumption" wherein individuals are exposed to commodifying their experiences influenced by pleasure and by the hunger for leisure and entertainment. It further suggests that consumer behavior is directly changed through better "experiential consumption" which then dictates contemporary values of experience are measured by contemporary means of doing things[7].

Argenton's discussion of the 'experience' and its existence in a contemporary context introduces the concept of experiential values and the importance of them to be enhanced to attain positive consumer behavior.

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[7] (i.e. environments with recreational activities, social purposes, and knowledge learning)

In a much broader application of the 'experience economy', Zmyslony et., al (2019) share in their paper the concept of the experience economy through the lens of 'urban leisure format' (ULF); by making a thorough literature review of the said concept, they explain that experiences is malleable depending on the structure of an environment. Their paper suggests that the scientific basis of providing ULF is to promote leisure activities that would complement the experiential needs of a certain market/ group of people sharing the same environment.

The former conclusion goes well in line with Boo & Busser (2018). Their affiliations in business and hospitality management gave an opportunity for the authors to write a paper that tackles the concept of the experience economy in the tourism industry. They discuss the application of expectation-confirmation theory (ECT)[8] in a hotel setting which confirms that pleasurable events can influence a positive perception to visitors. The paper argues that the concept of 'pleasure' rooted from the environmental experience is driven by the cognitive- affective satisfaction of the visitors. That being said, Boo & Busser made a good point on how ECT can contribute in other hospitality settings such as healthcare facilities where visitors and patients/ clients are the main types of individuals staying inside the setting. Since my research will be touching upon the effects of digital experience to customer experience in healthcare, the theory could be of great use for methodological purposes.

On the other hand, Underwood et., al. (2018) provides a contextual review of the difference between the problematic and satisfying experiences of healthcare visitors during their stay in a facility; the researchers explained that one solution to resolve visitor dissatisfaction is a good structural environment of a hospital that focuses on friendliness and hospitality. This argument holds a good point about how perceived positive environmental design coincides with the good experience of hospital visitors.

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[8] a cognitive theory which explains post-purchase or post-adoption satisfaction as a function of expectations, perceived performance, and disconfirmation of beliefs. (Oliver R. L, 1977, "Effect of Expectation and Disconfirmation on Postexposure Product Evaluations - an Alternative Interpretation," Journal of Applied Psychology, 62(4), p. 480.; Oliver sauce R. L, 1980, "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions," Journal of Marketing Research, 17(4), p. 460.)

Changing the environmental design of a healthcare facility is crucial to 'friendliness and hospitality' outcomes as noted by Underwood et., al. (2018). According to Gabutti et., al (2017), one of the pillars of the change in the healthcare environment is a patient-centered model emerging as a strategy for customer engagement. It suggests that a patient-centered model works through an effective management communication system that empower internal and external communications; the authors found the use of Information-Communication Tools (ICTs) is able to enhance workflow in a healthcare organization such as providing health information records to identify patients easily. Their literature review provides a good existing strategy that focused on the convergence between digital technology communications and healthcare experience.

However, this collection of studies seems to be lacking in clear explanation as to how this environmental change or model directly affects patient or visitor engagement in healthcare, particularly describing a general picture of what a 'healthcare experience' is all about. The gap is also visible in terms of determining which healthcare activity should be examined as an experiential behavior in the healthcare environment. In this sense, the next few parts of my literature review aims to describe a general perspective on the healthcare customer experience, focusing on a specific activity/ behavior which is 'waiting'.

The next section of my literature review covers customer experience discussing the 'waiting experience' of healthcare customers. This describes what individuals perceive and experience during their waiting activity inside a healthcare setting, and how the healthcare environment influences their waiting behavior.

2.2.4. The Waiting Experience & The Psychology of Waiting Behavior in Healthcare Settings

The objective of this section is to be able to picture what it feels and looks like waiting in a healthcare environment, and how a healthcare facility's environmental design affects the waiting

behavior of individuals. The set of literature I gathered in this section talks about the waiting

experience that coincides with customer communications in a healthcare context.

In her literature review, Lang (2012) states that a key factor to ensuring better patient

satisfaction outcomes is to invest in (1) healthcare facility's structure, (2) staff-patient

communications, and (3) patient-centered talking styles. Improving a healthcare facility's structure,

as stated in Lang (2012), resonates Saffarania et., al. (2012)— the study talks about the effects of

environmental design to enhance psychological and physiological responses of healthcare

stakeholders; individuals in the waiting area are tested with their anxiety levels, blood pressure,

and pulse rates. The researchers discovered that those immersed in a tech-enabled waiting

environment have reduced anxiety levels, lower blood pressure, and pulse rates.

Moreover, scholars in the design and health & wellness fields Douglas et. al (2018) explain

in their research the importance of spatial design[9] in the public waiting area of an intensive care

unit; they explain that a healthcare environment with high levels of stress and anxiety is perceived

as 'impersonal', 'unfriendly', and 'uncomfortable'. Saffarania et. al (2012) and Douglas et.al

(2018) provide pieces of evidence that environmental design in waiting situations supports and

enhances healthcare experience, and is important to the public's perception of a healthcare service.

As Rogers et., al (2016) suggests, the relationship between the physical environment of a

healthcare facility and the environmental experience it attributes is significant; the researchers

analyzed the evaluation of a visitor's experience while they are inside the waiting and therapy

rooms. They discovered participants' perception of the physical environment is linked to their

emotional experience— it was found that the support for emotional experience should be included

in the environmental experience of a healthcare setting.

In addition, going back to Lang (2012), communications between the healthcare

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[9] a relatively new conceptual design discipline that crosses the boundaries of traditional design specialisms such as architecture, landscape architecture, landscape design, interior design and service design as well as certain areas of public art

organization and its stakeholders is vital to providing better customer experience. Medical experts Wright et., al (2017) describe in their paper the roles of patient experience and real-time feedback (RTF) for healthcare service improvement; the researchers discovered that patient's RTF through using digital touch screen kiosks has received positive views with regard to providing immediate response/ survey to a specific service.

As Umar et. al (2011) suggests, patient satisfaction is a key indicator for perceived good quality healthcare; the researchers conducted a cross-sectional descriptive study involving 384 new patients who were randomly picked and assessed with pre-tested questionnaires. They found that 31% of the total participants waited less than an hour inside the waiting room, and 96.6% of the total participants spent less than half an hour in their doctor's appointment. The researchers concluded that there is a need for healthcare institutions to provide policy strategies to reduce waiting times and to ensure patient satisfaction through better communication service delivery. Umar et. al's concept of healthcare satisfaction through reduced waiting time introduces an opportunity to create a resounding argument stating that "better customer communication equals better healthcare service".

The above findings support the notion that waiting experience, standing as a significant variable to a healthcare's brand of customer service, should be reinforced by strategies like using DST as a solution for providing better waiting responses. For instance, Chu et. al (2019) claims patient waiting time as a quality metric in measuring healthcare experience; the authors examined factors that shape a patient's response to waiting time, including the promotion of positive wait experiences and the mitigation of negative waiting experiences. Using both quantitative and qualitative study, they discovered 'willingness to wait' depends on the patient's value of visit and his cost of a long wait; these influences can be reinforced by providing customer communication solutions such as opportunities to divert a patient's attention for him not to think about waiting.

Chu et. al's findings, together with Umar et. al's conclusion, suggests that people equate their healthcare experience with their waiting experience, and thus implies waiting responses or behavior reflects a healthcare organization's care for their customer's experience.

Locatelli (2015) found that the healthcare environment could be enhanced by examining the architectural design of a specific healthcare setting; through qualitative study, it examines patient-centered healthcare environments discovering environmental factors (attractiveness and function) that influence a patient's care perception of a given setting. For instance, Stevens et. al (2019) talk about in their paper the experiences of people with hearing loss inside a healthcare environment— the authors discovered that there is a necessity in revisiting the environmental design of a healthcare waiting area to meet the needs of specific audiences in order to avoid miscommunication. Thus, this is only one of the many circumstances where visual experience— as a customer communication function— is also crucial in a healthcare setting.

For example, the challenges faced by people with hearing loss (i.e hearing one's name or number when called) clearly reports waiting experience is directly affected by something beyond the control of a healthcare organization. These difficulties can be resolved by using an appropriate tool for communication; it implies using visual and tactile[10] materials to provide better communication for people with hearing loss, together with translating text-based health information (Stevens et. al, 2019). The findings, conclusion, and the implications of the former articles suggest that better waiting experience is supported by better customer communication.

Furthermore, Dempsey (2019) is a review of related literature discussing strategies for messaging intervention related to increasing vaccination rates. The author explained how digital technology (in the form of videos as a messaging tool), supports and improves adult vaccination rates in healthcare waiting areas. Her review was an informative way on how digital-based intervention increases vaccine participation and improves clinic's workflow and resources

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[10] in context of a digital environment, it describes something perceivable by touch or something tangible, and sometimes demands for interactivity

management. Despite limitations of the author's review on conducting an actual scientific experimentation (primarily due to lack of other available examples to be cited), her writing still provided a strong manifestation on how technology can influence people into participating programs particularly in a healthcare setting.

In other words, the influence brought by technology has an impact towards positive customer communication outcomes including better customer experience. Meanwhile, behind all these existing studies about the waiting experience in healthcare, there is seemingly lacking in discussion with regard to what characteristics or components of digital technology (digital screens in particular) are the ones that trigger and are responsible for psychological and physiological influence on human behavior. This is where the objective of the next section of my literature review comes in— I intend to review existing studies about the scientific basis of digital signage screens, and how they contribute to manipulating human perception and waiting behavior.

2.2.5. The Science Behind Digital Signage & The Visual, Cognitive, and Emotional Experience

Previous sections of my literature review covered a general overview of the digital signage as a tool for communication, and how this tool affects the waiting experience of a person in a healthcare setting. To complement these sections, this last set of literature intends to explore the scientific explanation on why a digital screen influences human experience, particularly targeting human cognition to manipulate waiting behavior.

Petersen et., al (2018) discusses the effects of visual technology on systems thinking[11]; they conducted a two-part study in which the first one's data analysis was through quantitative analysis discovering that a second study has to explore its weaknesses and limitations further. The

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[11] an analysis approach focusing on the way a system and its parts are connected or interrelated among each other, with the intention of balancing and reinforcing thinking processes

second study, still in quantitative approach, concludes that specific aspects of systems thinking are influenced, shaped, and enhanced through exposure to visual manipulations of digital technology; it was implied in the study that communication technology could be used to promote control on cognitive experience.

The above research shows cognitive experience is directly affected by how an individual uses and perceives technology. Meanwhile, it lacks explanation on what kind of changes does digital communication affect cognitive experience (i.e. to make a decision or to retain information). Despite this, however, it still holds a strong argument on how technologies are able to manipulate human cognition in order to adapt in a digital environment.

Meanwhile, a hypothesis describing that interactive digital signage has a cognitive effect on individuals' experience was formulated in Alt et., al (2013); the research hypothesis is tested in a quantitative approach to examine the ability of digital signage viewers to remember what they have seen on the screen. The results suggest that digital signage involved three areas of recall and recognition: an increased awareness of the viewers about the content they interacted with, a positive experience for the viewers to engage with the display screens, and a perception that the display screens improved information dissemination.

In other words, the above conclusion fills in the gap in Petersen et., al (2018)— while viewing a digital signage screen, the kind of change in cognitive experience involves increased awareness and improved perception. However, the Alt et., al (2013) paper only focused on the playful or interactivity element of digital signage and has no focus on the informative side of the screens. Despite this, the above study provides a strong argument relevant to my research: digital signage, specifically the interactive ones, could be a strategic tool for healthcare waiting room visitors to retain information or improve perception, to increase awareness or cognitive experience, and to make an informed decision.

I found a study that resonates the above conclusions; Mazor et., al (2016) wrote a literature review and conducted an actual simulation of an installed digital signage dashboard to determine its impact inside an emergency department's patient waiting area. The results of the simulation claim to produce a decrease in patient's length of stay up to almost 50% of an average waiting time. It indicates that when patients look at the screen to view their waiting time, it helps them decide whether to stay longer or leave; this proves that such reinforcement to waiting behavior resolves challenges in emergency waiting areas such as overcrowding. Mazor et., al. (2016) made a good point about how the shift in environmental design in the waiting area enhances reinforcement in the waiting responses of individuals, which also eventually reflects environmental change in the healthcare setting itself.

While the former set of studies indicates a good foundation for the context of my research, there is still an opportunity to look at the components of digital displays and which of these trigger physiological and psychological effects to individuals. In other words, looking at this principle may prove whether the message or the content a digital signage flashes on the screen is the one responsible for change in waiting behaviors.

For instance, Iwanami et. al (2011) discuss the psychological effects of ambient displays in enhancing the visual experience; they discovered that controlling the digital content on a display affects human sensation and comfort. Their research shows that whenever an LCD screen is flashed with a digital video image, the feeling of "activity" and "evaluating" is experienced by individuals who also have the feeling of "comfort". Their argument shows strong evidence in terms of showing the specific benefits of ambient controlling with respect to visual experience; however this only involves a generalized explanation on the results solely based on displays with added features (LCD). Nonetheless, the research provides good evidence on the psychological benefits of displays.

On the other hand, Shishikui et. al (2018) claims the psychological effects of viewing high-resolution images; using a subjective evaluation experiment as a research approach, the paper investigated non-standard viewing conditions of the participants in which results showed higher image resolution flashed on digital screens affects the sense of realness of the image object. The study concludes that increasing the resolution of the images displayed on the screens increased and enhanced the perception of "beauty" of an image. This evidence proves that there is an opportunity to utilize digital screens as tools to feature high resolution images in order to provide a better visual experience. Despite the fact that the study was conducted in a conventional subjective approach, there is still room for further study whether outcomes on visual experience could also be justified through a healthcare communications approach.

Stalder (2010) explains that pervasive communication tools like digital media capitalize on three effects: illumination, spatiality, and temporality. The research suggests that digital screens' light, graphics, and luminosity act as stimuli to influence positive perception; meanwhile, movement of images and/ or videos on the screen helps viewers to easily adapt in a digital environment and then transforms this environment into a dimension of emotional attachment due to disrupting a physical experience into a digital experience. Stalder's work shows how digital media is a catalyst for people's perception on what a digital environment and a digital experience are; this argument works on the notion that environmental experience in distressed and anxious settings could be mitigated through digital technology.

In other words, and to also reiterate Iwanami et. al (2011), the human experience (through visual manipulation) is affected not only by the content flashed on the digital screens but also by the characteristics a screen attributes. Meanwhile, the transition from physical experience to digital experience as suggested by Stalder (2010) resonates with Ijaz et. al (2016)— the use of digital signage (touch screen, for example) and its usability outcomes such as usefulness and better

customer-store relationship concludes that the interactivity design of an environmental experience largely enhanced the digital experience and thus reports positive customer engagement through physical sense. Thus, this supports the argument that user experience is directly proportional with device usability; despite focus in a more common setting that is a retail setting, the study still shared a valuable knowledge about the potential use of digital signage for customer engagement. Thus, this possibility brings opportunities for further study in settings where customer (and even brand of service) experience matters most such as in healthcare.

I discovered a paper that talks about digital signage advertising and its effects on brand experience and attitudes; through hypothesis testing and statistical analysis of data, Han (2016) differentiated advertising attitude and brand attitude according to digital signage experience. The research concludes that the low interactivity level of digital signage has a positive effect on brand and advertising attitudes as compared to high interactivity level; the brand experience is related to that of advertising attitude which has a positive effect on the cognitive experience of an individual. Meanwhile, the brand attitude has more effects on the sensible experience of an individual. This evidence suggests that digital signage can have direct psychological effects on individuals in relation to their brand experience; this also stands as a good foundation on how brand experience is related to the experience of the brand of service a healthcare company or organization provides customers (i.e. patients, visitors, and other stakeholders).

To summarize, I found that human experience branches out into different attributes: visual, emotional, and cognitive to name a few. The 'waiting' activity of human behavior is influenced by the effects (physiological and psychological) induced by the digital signage screens as seen by an individual in a particular setting. The three experience attributes mentioned above are the results of the overall environmental experience; these outcomes are the ones responsible for stimulating positive effects on human experience.

2.3. Analysis of Findings from the Literature Review

My approach for analyzing the findings I gathered from the literature review consists of a roadmap and a summary; the former represents a diagram representation of all data collected and the gaps for each sub-topic, and the latter assesses the overall outcomes of the literature review and how it informs the design of my research topic. A simplified version of the roadmap is included below while a detailed version is attached in Appendix A.

Literature Review: Road Map

| using digital technology for customer experience | Digital Signage Technology (DST) strategies in various settings | the 'Experience Economy' & healthcare customer communications | the waiting experience & the psychology of waiting behavior in healthcare settings | the science behind digital screens |

- convenience
- transaction cost
- media production & distribution
- customer dynamics
- participatory & engaging
- brand/ service loyalty

- POS, POT, POW
- influence to purchase
- communication effectiveness
- information awareness and digital environment adaptation
- digital experience particular to customer experience

- Pine & Gilmore
- experiential consumption
- urban leisure format (ULF); expectation-confirmation theory (ECT);
- environmental design in healthcare for positive experiential values

- customer communications for patient satisfaction
- 'friendly' environmental-spatial design
- emotional experience = physical environment
- patient satisfaction = positive perception on healthcare service
- 'efficient patient waiting time' metric
- patient-centered
- visual communications
- communication intervention increases participation

- communication technology controls cognitive experience
- recall and recognition
- interactivity
- decision making
- the feeling of 'comfort'
- 'realness' and 'beauty'
- illumination, spatiality, temporality
- visual experience
- brand service and customer experience

Gap: *"What is/ are the specific strategies used to provide better digital experience?"*

Gap: *"What is 'experience' and where is healthcare communications?"*

Gap: *"What is the (waiting) experience in a general healthcare context?"*

Gap: *"What characteristics/ components of digital technology (digital screens to be specific) are the ones responsible for influence waiting behavior?"*

Gap: *"What is the implication of this in an existing healthcare environment?"*

Fig. 1: Literature Review Road Map (Cordero, 2019)

The results from my literature review informs my research topic that aims to answer the question: *"What is the digital signage experience of visitors inside the waiting area of a healthcare facility?"*. The formation of my research question relies heavily on applying the concepts gathered in the literature review for an identified research setting. My research question fills the gap in the literature review: to explore why an existing healthcare waiting area uses DST to reinforce the waiting experience of its customers and to supplement waiting behaviors. The communications aspect of DST has been the core of all the literature I have found, yet another variable— the experience— had little to no recognition about its significance in a healthcare context.

Based on the gaps for each sub-topics of my literature review, I discovered that there is an

opportunity to examine an existing healthcare facility's specific strategies and functions of using DST in order to cover both communications and experience variables of its healthcare 'environment'. The findings from the literature review suggest that the waiting behavior of a specific group of individuals can be determined through exploring an existing healthcare facility; thus this implication claims that while I may have presented a generalized conclusion taken from the literature, there is still a gap in applying the research concepts through a case study approach to further the qualitative/ descriptive methods used within the existing literature gathered.

2.4. Literature Review Chapter Summary

The purpose of this chapter is to provide a framework I can use to conceptualize my own research. Through gathering existing literature and reviewing academic and scholarly sources, I determined the design of my research topic that focuses on the use of digital communications in a healthcare context. Findings in the literature review suggest that 'communications' is only a small piece of the wide ecosystem of DST usage in healthcare communications— 'experience' is another component/ attribute which I am centering to structurize my research context.

In theory, it is explained that waiting experience inside a healthcare setting is influenced by many factors, including its digital-environmental design. That being said, my research question aims to discover the digital signage experience of visitors inside the waiting area of a chosen healthcare facility. In the next chapter, I will explain the research design and methodology for my capstone project. The next chapter includes the theoretical and operational frameworks I will be using, the overall data gathering process for my capstone project, and the analysis and other research considerations culminating the project

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CHAPTER THREE: RESEARCH DESIGN & METHODOLOGY

My research question aims to discover the digital signage experience of visitors inside the waiting area of a chosen healthcare facility. Literature review's analysis suggested that there is an opportunity to examine an existing healthcare facility's strategies of using DST for covering communications and experience as attributes for a healthcare waiting environment.

The goal for this chapter is to explain how theories and concepts— Pine & Gilmore theory, and Denscombe's explanations on grounded theory and phenomenology approach— are integrated and applied to my capstone project's framework. My objectives are particular to explaining and describing the waiting experience of the chosen research setting.

In this chapter, I will explain the research design, research strategy, data collection and procedures, and analysis methods of my capstone project. The research design covers theoretical and operational frameworks I used as fundamental concepts for the research strategy; the research strategy tackles the case study approach of my research including the sampling and the recruitment components. The strategy for data collection, as well as ethical considerations and other research analysis procedures are also included in this chapter.

3.1. Research Design

3.1.1. Theoretical Framework

My research framework is composed of different theories and approaches in which pieces are put together to form the concept of 'the experience' I am exploring. First, I reiterate the concept found in the literature by incorporating Pine and Gilmore's Experience Economy (or the concept of Experiential Dimensions). This will be supported by two other concepts— phenomenology and grounded theory— that are explained by Denscombe

(2010) as the key components in identifying the phenomenon (experience) to be described in my research.

The Pine and Gilmore theory suggested that experience is both participated and acquired through four key human activities: active or passive participation and absorbed or immersed acquisition (Pine & Gilmore, 1999; Pine & Gilmore, 2014). Active or passive participation explains the kind of involvement a person exerts to participate in the experience; meanwhile, absorbed or immersed acquisition determines the level of attention paid by a person to be involved in the experience.
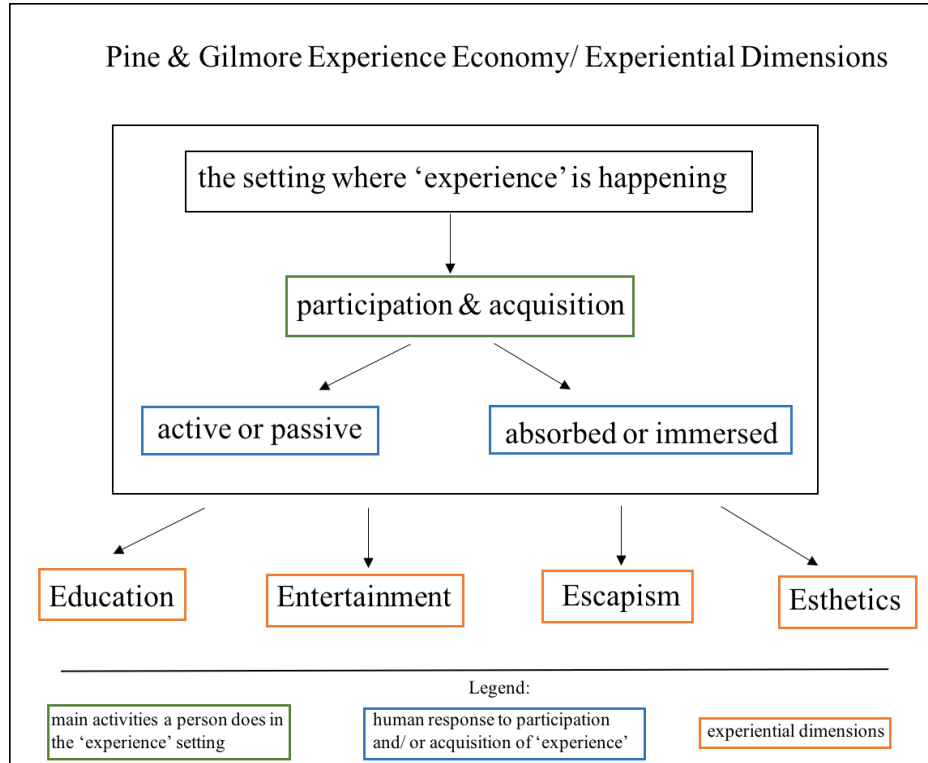
Fig. 2: Theoretical Framework inspired by Pine & Gilmore's Theory (Cordero, 2020)

The above theory is expanded into dimensions: education, entertainment, esthetics, and escapism. Education dimension explains the desire of a person to learn new things during experience participation and acquisition. Entertainment dimension identifies the pleasure a person is willing to experience during participation and acquisition. Esthetics dimension relates to the person's interpretation of the physical environment of the

'experience' setting. Escapism dimension describes the ability of experience to divert the person's attention into the feeling of relaxation (Pine & Gilmore, 1999; Pine & Gilmore, 2014).

Meanwhile, Denscombe (2010) introduces phenomenology and grounded theory that relate Pine and Gilmore's theory. These support my research framework by leading me into strategies and approaches I use for operationalizing my research. Phenomenology as an approach focuses on investigating human experience by analyzing the reality of a given setting. This relies on descriptive analysis of a person's narrative of his experience (Denscombe, 2010).

On the other hand, grounded theory is dedicated to emphasizing the investigation of human experience by using field observation (Denscombe, 2010); this generates relevant sub-theories and principles that help me link the descriptive analysis mentioned above to the specific explanations of the phenomenon (experience).

All of the above theory and concepts were used to develop my research design; I considered them as guidelines informing the concept of the 'waiting experience' highlighted in my research. The below diagram is a conceptual framework:

Conceptual Framework

Phenomenology

qualitative approach in social research

making sense of reality

small-scale research through in-depth data gathering

descriptive and uses narration from field observation

interpretative and exploratory

Grounded Theory

qualitative approach in social research

dedicated to generate theories

uses empirical fieldwork to study human interaction

desired to generate explanations from the study of particular instances

data gathering would be semi-structured & analysis of data could be through coding and themes recognition

field observation & small-scale

4

1

3

2

to know the person's level of participation & acquisition of an 'experience' of a given setting

'experience' is acquired & participated through (1) active or passive participation, and; (2) absorbed or immersed acquisition

experiential dimensions: education, entertainment, escapism, esthetics

Pine & Gilmore's Experience Economy

1. **Research Question:**
What is the digital signage experience of the *stakeholders inside the waiting area of a certain Alberta Health Services (AHS) facility? (*visitors, patients, and staff/ employees)

2 and 3. Data Gathering Strategies & Analysis:
small-scale, field observation, semi-structured survey, coding and categorizing data for analysis (inc. themes recognition)

4. **Research Method/ Approach:**
qualitative, descriptive, exploratory, interpretative

Fig. 3: Conceptual Framework (Cordero, 2020)

I came up with the above conceptual framework to help me operationalize and organize my research questions. In its core is my main research question asking about the digital signage experience of individuals inside a waiting area. The research question is then expanded into different sub-questions to form the content of my research instrument; the content will be discussed in the next few parts of this chapter.

3.1.2. Operational Framework

My research question is operationalized into three sub-questions: (a) knowing what is the kind of involvement healthcare visitors were doing while viewing the digital signage in the waiting area; (b) identifying what is the level of attention paid by healthcare visitors in viewing the digital signage while waiting in the area, and; (c) determining healthcare

visitors' general perception about their digital signage experience. The diagram below

shows my research operational framework:
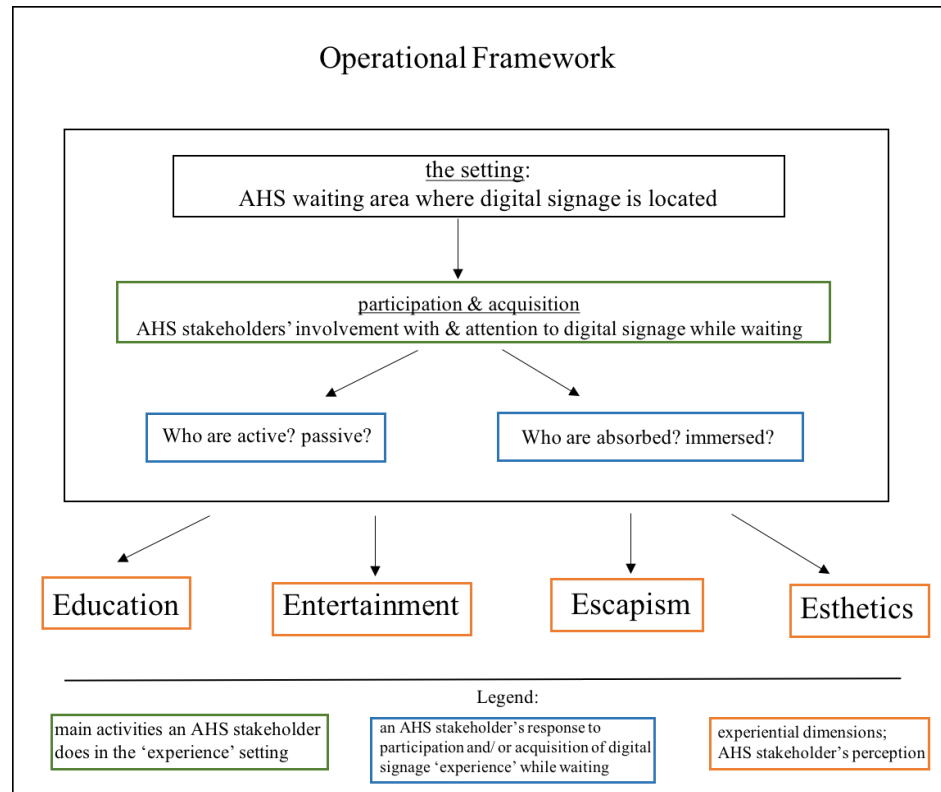
Fig. 4: Operational Framework (Cordero, 2020)

I relied on Pine & Gilmore's theoretical account and contextualized it into the above

operational framework. While my main research question seeks an answer about the overall

digital signage experience of a healthcare visitor inside the waiting area, there were still

sub-questions that were underlying such as the three areas I mentioned in the former. This

framework above is also used for data interpretation which will be discussed in the

following chapter.

3.2. Research Strategy

I chose qualitative description as my research strategy to have a deeper understanding of the

waiting experience phenomenon happening in my chosen research setting. Resonating one of the

qualitative research approaches introduced in Yin (2012), I used a case study approach to be able to present the "case" of the waiting area experience in an AHS facility.

3.2.1. Case Study Method

The case study method as a qualitative research approach involves explanatory and descriptive procedures (Yin 2012). I chose a case study method in order to provide an in-depth description of the social events happening in my chosen real-life waiting situation and to illustrate key issues on the digital signage and waiting experience (Denscombe, 2010).

In other words, the case study method was appropriate for my research and setting to examine and to test the theoretical and conceptual frameworks mentioned in the former. The data from the 'case' was incorporated with the operational framework to be able to integrate and analyze the collected information from a real-life setting.

The "case" of my study was to explain and describe the waiting experience in a healthcare setting, and to discover the experiential dimensions existing in the said waiting area by using theoretical and conceptual frameworks mentioned above.

3.2.2. Participants, Sampling, and Recruitment

Edwards and Holland (2013), as cited in Brinkmann (2013), claims that one of the foundations in selecting the research participants for a qualitative study is to ensure that the target population fits the context of the research and matches the criteria implied by the research question.

The type of participants chosen for my research were healthcare visitors or clients/ patients who watch the digital signage installed in the waiting setting. Employees or staff

who also visited in the area were excluded from sampling and recruitment; purposive sampling was used to select a specific group of people who waited in the area and were participants of the naturally occurring waiting experience (Denscombe, 2010).

That being said, through purposive sampling, I gathered research data among people who are staying in the waiting area of Alberta Health Services (AHS) facility. I purposefully sampled at least 15 visitors. Research participants included in the selection and recruitment were only those individuals who are in the waiting area where the digital signage screens are located. I decided to focus on visitors or clients/ patients as research participants since the waiting activities and the function of the digital signage in the waiting area were meant for their viewer consumption.

3.2.3. Setting

The research setting selected for this study was a waiting area in the Kaye Edmonton Clinic- Urology Clinic (KEC-NAUC), an AHS facility located in Edmonton, Alberta. Individuals in this setting come here to visit the area and wait for their scheduled appointment. The selected waiting setting was chosen primarily because there is enough viewer traffic of the digital signage installed in the area, and the visitors wait on the seats where the digital signage was seen.

I initially looked at a nursing facility to be my research setting; however, this type of setting has to be rejected due to its environmental design (low traffic i.e. viewers of digital signage screens) and the people involved in the waiting experience (most people are residents with dementia). This decision was made on the basis of certain factors which include contradiction to the theoretical and conceptual frameworks of my research, and the feasibility and ethical considerations such as research participants with limited ability to

give in-depth information (Edwards & Holland, 2013, as cited in Brinkmann, 2013; Miles et.al., 2014).

3.3. Data Gathering Strategy

Data were gathered using field observation and semi-structured survey questionnaires to get a general sense of the physical setting and interactions in the KEC-NAUC. These strategies were also used to account for the respondent descriptions of the waiting experience in that facility.

3.3.1. Observation

I chose field observation as the first phase of my data gathering to generate notes on the physical setting and interactions. I set approximately 45-60 minutes for the observation. I conducted the observation on a weekday during lunchtime; weekdays during this time was chosen to observe a busier and larger traffic of visitors. I took field notes while doing the data gathering activity; field notes were essential for not only taking down first-hand observation of a given setting but also were crucial to reviewing and discovering points that may be used in writing the qualitative data analysis (Check & Schutt, 2012, as cited in Cohen et. al, 2017). That being said, I directed my observations and took notes on three areas: the waiting environment, the digital screens, and the visitors.

The field notes were meant to account for the atmosphere and the ambiance of the waiting area, and the overall infrastructural design of the space. This was also used to observe the physical attributes of the digital signage screens installed in the waiting including the content flashed on the screens. The waiting behavior of the people was observed during their stay in the waiting area; field notes were taken to acknowledge the actual activities done by the people observed, and to see their waiting experience first-hand.

3.3.2. Survey

In order to get more detailed data about the waiting experience of a specific research respondent, I employed a semi-structured survey questionnaire. Denscombe (2010) and Saldaña (2013) were consulted to ensure that the questions were strategic and well-aligned with the goal and objectives of the research design. These sources were tapped to measure the cohesiveness of the questions in the survey instrument, to evaluate the length and wording of the survey questions, and to develop the structure of the overall content of the survey questionnaire.

3.3.2.1. Developing the instrument

I constructed a 13-item-question paper survey. The survey was composed of questions that required the respondents to choose an answer from and questions that required the respondents to answer in text-form. The questions were based on the theoretical, conceptual, and operational frameworks mentioned in the previous part of this chapter. A copy of the research instrument is attached in Appendix B.

Meanwhile, I found that administering the survey in paper format would be the better option rather than conducting it in digital means; there were limited digital resources and the research setting restricts the respondents to answer questions online.

Moreover, the choice of words used in the questions of the survey is developed by using Grade 9/10 reading level. This decision was made so respondents could easily understand the questions and the purpose of the study being conducted.

3.3.2.2. *Questionnaire content*

To reiterate my operational framework, the content of the questions revolved around three areas: knowing the respondent's kind of involvement in the digital signage experience, identifying his or her level of attention towards viewing the digital signage, and determining his or her general perception of viewing the digital signage while waiting.

At the very start of the survey, a picture of a digital signage was presented to the respondent so that he or she had an idea of what was being asked in the questionnaire. Providing the respondent a photo of what a digital signage looks like helped them better understand the following questions.

The first few questions of the survey asked about the respondent's waiting activity. These included the number of hours spent while waiting in the area, the number of times he visited the waiting area, his awareness of the digital signage located in the waiting area, and the time spent in viewing the digital signage.

The following questions directed the respondents to share their thoughts about the waiting area, the digital signage, and the overall physical components of the two. These questions included rating the general atmosphere of the waiting area and if digital signage enhances the atmosphere of the area, the level of noise in the waiting area and the preference whether a digital signage should have an audio, and the appearance or the physical environment of the waiting and if the digital signage adds attractiveness to the waiting area.

The latter part of the survey focused on the perception of the respondents in regards to the digital signage experience. The questions were meant to gather

in-depth information about how he or she looks at the waiting experience in the lens

of viewing the digital signage. The questions included his or her preference on the

content flashed on the digital signage screen and whether he or she sees it relevant,

his thoughts on the benefits of digital signage in the waiting area and why does he

think digital signage fits the waiting area experience, and the things digital signage

could or could not provide to him or her while waiting.

The survey ended with asking the respondent of his or her general digital

signage and waiting experience. The survey concluded into asking the respondent,

too, whether there is something he or she wants to add. The purpose of concluding

the survey like this was meant for me to gather feedback on the content of the survey

itself and for future research purposes.

3.4. Procedures and Ethical Considerations

My capstone project was a collaborative effort between me and the Alberta Health Services'

Unified Communications Services- Digital Media Services. In this regard, the approval processes

for both the Ethics Application (under the Research Ethics Board of the University of Alberta) and

the AHS administrative bodies were done in consideration of having two separate timelines.

First, I crafted a research brief and a letter of intent (for conducting the observation and

survey), and answered the online approval form provided by the Research Ethics Board. After

getting approved of the ethics application, I then requested another approval from AHS Research

Office to confirm the beginning of my project.

After getting the confirmation from AHS, I carried out the observation followed by

conducting the survey. The data gathering strategies required me with supervision of a healthcare

site administrator. These strategies were done by appointment due to some factors including

availability of a site administrator, visitor traffic on the waiting area, and scheduled visitation procedures.

It is recommended to anticipate challenges in the process of research approvals. I found that working on a project for a particular organization involves strict time and process management. It is expected to have revisions from time to time, thus it is advised to work on the Ethics Application as soon as possible especially if the research involves a potential research setting and participants that may or may not fit the goal and objective of the research, and if there will be unforeseen circumstances.

Meanwhile, there were considerations in the ethical procedures that were adjusted especially in the delivery of data gathering for my research. Data collection was cut short due to COVID-19 Pandemic declaration of the World Health Organization, and conducting in-person data gathering was prohibited.

3.5. Analysis

Denscombe (2010) suggests that in qualitative research approach, the best practice for data organization and analysis is to catalogue the text and look for recurrent themes or concepts, and categorize them based on the set operational framework. This process is followed by writing the interpreted data in either text or visual form depending on the findings to be illustrated.

A limitation of my analysis is that I had not met the target number of survey respondents to get the data from. Data triangulation and coding were not used due to data insufficiency. However, as suggested by Denscombe (2010) and Campbell et. al, (2013), I instead used an inductive approach for analysis; each data from respondents were examined, and recurrent answers were classified according to specific themes and concepts.

Moreover, Golafshani (2003) broadly explained that using flexible methods in qualitative research controls bias in data analysis and strengthens data transparency. In order to promote validity and credibility for the research design, three methods were done in this aspect: (1) pre-testing of the survey instruments was done to improve clarity and relevance before data collection; (2) researcher bias was minimized in order to comply with an objective research analysis; and (3) accounted data from the limited number of respondents was summarized and interpreted using categorization and theming methods instead of triangulation and coding.

3.6. Chapter Summary

Existing literature points out an opportunity to examine an existing healthcare facility's strategies of using DST for covering communications and experience as attributes for a healthcare waiting environment. This chapter explained how the research design was informed by theories and concepts— Pine & Gilmore theory, and Denscombe's explanations on grounded theory and phenomenology approach— that were integrated and applied to explain and describe the waiting experience of my research setting.

In this chapter, I also explained that the research and data gathering strategies primarily focused on conducting a case study approach for healthcare visitors as research participants. Sampling, research procedures, and other ethical considerations were included in this chapter to explain how the capstone project was carried out. My research used qualitative description in an inductive research approach for data analysis.

The next chapter presents the findings, the discussion of data collection, and the analysis and interpretation of the data gathered for the research.

CHAPTER FOUR: FINDINGS & DISCUSSION

This chapter exhibits the collection of data that provided answers to the question "*What is the digital signage experience of visitors inside the waiting area of a healthcare facility?*". This main research question was divided into three areas: (a) knowing what was the kind of involvement healthcare visitors were doing while viewing the digital signage in the waiting area; (b) identifying what was the level of attention paid by healthcare visitors in viewing the digital signage while waiting in the area, and; (c) determining healthcare visitors' general perception about their digital signage experience.

I examined the case of my research through discovering the digital signage and waiting experience of my chosen setting. In this chapter, I present the data gathered from two strategies: field observation and survey. The research design and methodology for my qualitative case study was to explore and describe the experience phenomenon happening in a healthcare facility, and to organize and analyze the data collected based on the theoretical, conceptual, and operational frameworks discussed in the previous chapter.

First, data are presented in this chapter according to the field observation notes and the survey findings. Second, these data are unitized, organized, and analyzed in the lens of categorization and theming methods for data interpretation and discussion. And lastly, recommendations and limitations of research are presented to summarize the findings and discussion chapter.

4.1. Data Presentation

This section of the chapter presents the observational and survey questionnaire findings. Notes were taken down from the field observation through a document in a Microsoft Word format, and answers from the paper survey questionnaire were organized through a document in a

Microsoft Excel format. As previously stated in the former chapter, I had a random visit in my chosen setting and conducted an observation as the first step for data collection. The survey questionnaires were then given to the respondents as the next and final step for data collection. The next few parts of this section of the chapter present the data for observational and survey findings, respectively.

4.1.1. Field Observation

In order to gain an initial picture of how the digital signage and waiting experience occurs in Kaye Edmonton Clinic- NAUC waiting area, I conducted a random observation that lasted for an hour.

I observed the overall waiting environment and took notes of the observation. I organized my observation field notes into three: the physical environment, the digital signage screens, and the waiting behavior of the participants.

4.1.1.1. The physical environment
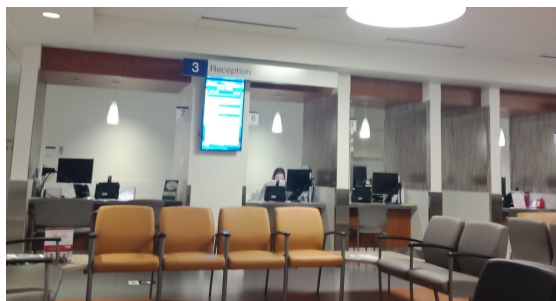
Fig. 5: The physical waiting setting

The general atmosphere of the waiting area is cozy, quiet, and well-lit. The area was not crowded and there were enough spaces and chairs for people who were visiting and waiting. The overall infrastructural design has digital boards, reception booths, and the digital screens all installed where people can easily look at them.

There were six booths for reception, two for support staff, and one for other

consultations. The seats were arranged in vertical alignment, each line not facing the

respective reception booth.

4.1.1.2. The digital signage screens
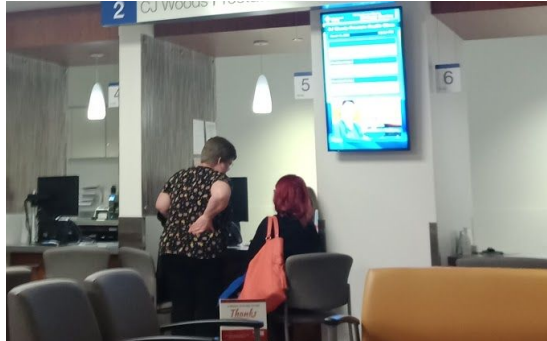
Fig. 6: Digital Signage Screen

The total number of screens is four. The physical attributes of the screen

were TV-like but pinned on the walls vertically. The ratio of the screens were

sufficient in terms of viewer traffic. The screens provided no sounds/ audio, and

multiple content were being flashed on the screens (i.e. health tips, safety guidelines,

waiting number, and doctor's details). Format of the content varies: text, video, and

image.

4.1.1.3. The waiting behavior of the participants
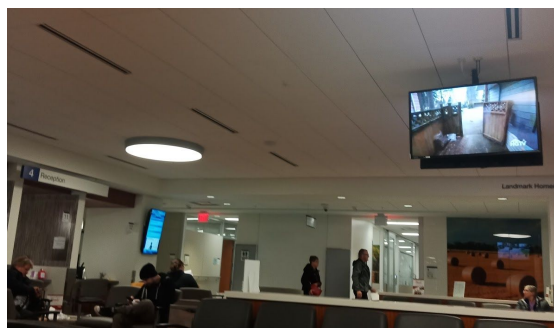
Fig. 7: A picture of the waiting participants

For staff and employees, most of them do not appear to watch or view the screens as the screens are meant for the visitors. Some employees, however, tend to stop on what they are doing and look at the screen to check the date, time, and waiting capacity only.

The waiting area and the function of the digital signage is designed for visitors and patients. It also appears that whenever the digital signage screen shows a text-based content, a viewer looks away. Most of them seemed to pay attention when the content is a video or an image of infographic. Meanwhile, other people brought newspapers and magazines especially those who are in the priority section of the waiting area.

4.1.2. Survey

Out of the 15 targeted participants, seven people were able to participate in the paper survey, all of which are either visitors or patients. Data collection for the survey was cut short due to COVID-19 that resulted in the World Health Organization's pandemic declaration.

The survey questions were intended to cover the three sub-questions of my main research question: (a) knowing what is the kind of involvement AHS stakeholders are doing while viewing the digital signage in the waiting area; (b) identifying what is the level of attention paid by AHS stakeholders in viewing the digital signage while waiting in the area, and; (c) determining AHS stakeholders' general perception about their digital signage experience.

Introductory questions were asked about the respondent's age as a basic demographic identification of who the 'viewers' of the digital signage screens in Kaye

Edmonton Clinic- NAUC are. All respondents were male, two respondents of which

belonged to the 30-39 age range, two respondents who belonged to the 50-59 age range, two

respondents who were 60 - older, and one respondent who was under the 21-29 age range.

4.1.2.1. Involvement

The survey questions in this section asked about the respondents' number of

visits in the waiting area and how long it usually takes for them to stay in the area.

They were also asked about their awareness of the digital signage screen located in

the area, and their participation in the digital signage experience while waiting.

The responses indicated in Appendix C present the consolidation of all

respondents' involvement in the digital signage and waiting experience.

Based on the consolidated data, a majority of the respondents visits the

waiting area twice a month with an average stay of less than an hour of waiting.

Their purpose of staying in the waiting area was usually due to a regular visit

(doctor's appointment), to sit and relax while waiting, and watch health news.

Almost all of them reported that the atmosphere of the waiting area was

relaxing and they felt that the waiting environment was quiet or calm. Meanwhile,

all were aware that there are digital signage screens located in the area. All

respondents reported that the digital signage screens enhanced the atmosphere of the

waiting area and preferred the screens without audio.

4.1.2.2. Attention

On the other hand, the survey questions in this section asked about the

respondents' level of attention paid in viewing the digital signage screen while

waiting in the area. They were asked about how much of their waiting time is spent in looking at the screens and their views on the appearance of both the waiting environment and the digital signage screens.

Further questions were asked to the respondents to know their reasons why they stay in the area and what they do if they are not looking at the digital signage screen. Their feelings towards waiting in the area while watching the screens were also asked; their insights as to whether they get benefits or advantages from viewing the screens while waiting were also gathered. The respondents' views on the type of content flashed on the screen, how they noticed the digital signage screen, and their attention paid to digital signage screens while waiting were also included in this section of the survey.

The responses indicated in Appendix D present the consolidation of all respondents' attention to the digital signage while they were involved in the waiting experience.

The data gathered in the 'Attention' section of the survey shows the collected responses explaining each respondent's answers for determining his paid attention to watching or viewing the screen. In the first few parts of this section of the survey, they were asked about the appearance of the waiting environment and the relevance of the screens in the waiting area.

All of them reported that they spent a significant amount of their waiting time looking at the screens; two out of seven reported that they look at the screen while waiting, while the rest sometimes look at the screen. In relation to this, four out of seven reported that the overall appearance of the waiting area was very good while three respondents reported that the appearance was good. All of the seven

respondents agreed that the digital signage screens enhanced their waiting experience because they added attractiveness to the waiting environment. Moreover, all the respondents reported that putting screens in a waiting area is relevant to their waiting experience.

Meanwhile, further insights were gathered from the respondents in order to compliment the above information they provided. The responses from the survey questions that required text-based answers were summarized below:

"How did you notice the digital signage screen located in the waiting area?":

The respondents reported how the digital signage screens were strategically located as they easily noticed them on the area's walls. Respondent 1 reported that "*[t]hey are everywhere…*" and Respondent 3 reported that *"it is an obvious thing to notice"*, both referring to the screens attached to the walls. Respondents 4 and 6 described the location of the screens as "*they are placed on each pillar/ booth where you wait for your doctor's room"*, and "*they [are located] on the side of the booth so it's easy to notice"*.

One respondent also reported that the physical size of a screen is large enough to get noticed; in fact, Respondent 5 reported that *"...[it is] quite big to notice so you can see it easily"*.

"Why do you stay in the waiting area and what do you do if you are not looking/ watching the digital signage screen?":

Five out of seven respondents reported that the main reasons for staying in the area are related to waiting for their appointment's turn, to sit and relax, and to use their other devices; being able to look at a phone or a laptop was something they were doing if they were not watching the digital screen.

<u>"How do you feel about waiting inside the area while viewing the digital signage screen?":</u>

Three out of seven respondents reported that one of their main reasons for staying in the waiting area is due to watching the digital signage screens; these respondents felt that the screens were meant to get them distracted and lessen their waiting anxiety.

On the other hand, it is also noted that Respondent 6 suggested that he felt that the screens have other functions aside from being a distraction or for relaxation:

> "I think it would be better to use the screen for interaction (like navigation, knowing other hospital facilities) like you know, a big digital board of hospital map (or even edmonton map)"

<u>"What is it about this waiting area that appealed to you the most? What benefit or advantages did you think you get from waiting there?":</u>

Respondent 4 reported that *"[t]he environment looks very modern as compared before when waiting areas look like plain white walls. I think it is really important to provide health-info on the screen while waiting, it's worth my time and reduces anxiety",* and Respondent 5 reported *"...it is the*

atmosphere that appealed to me the most. [I]t makes me think of something else and not worry too much about my appointment with the doctor".

Respondents 1 and 4 found that the waiting environment installed with digital screens was important to get health information which mirrored Respondent 5's report mentioning that the distraction produced by viewing the screens reduces waiting anxiety.

"What do you get from watching/ viewing the digital signage screen while waiting?":

In conjunction with the previous survey question answered, respondents reported of specific functions that best fit the digital screens. Four out of seven respondents reported that the screens helped them identify their appointment details, and six out of seven respondents reported that flashing content about health was also important while waiting.

4.1.2.3. Perception

Lastly, the survey questions that pertain to this section asked about the respondents' general preference and perception on both digital signage and waiting experience. They were asked about their preference on the content flashed on the digital signage screen and the relevance of the content itself; the respondents were also asked about what they think is the purpose of having a digital signage in the waiting area.

The consolidated responses in Appendix E present the respondents overall perception and preference on both waiting and digital signage experience.

Based on the responses, six out of seven respondents reported that they prefer images/ pictures, and four respondents preferred videos without audio as the primary content to be flashed on the digital screen; meanwhile, two out of the seven reported that they wanted text-based content.

In addition to this, six out of the seven respondents rated the relevance of the content flashed on the screen as 'good' and this significantly reflects their answers to the question about the purpose of the digital signage screens located in the waiting area. When asked about what they think is the purpose of the digital signage screen in this waiting area, five of the seven respondents reported that the purpose of the screens is to get them educated about health-information and two other respondents reported that the screens were just there to divert their attention by reducing their waiting anxiety.

On the other hand, the survey asked the respondents to rank their preference in terms of what they think the role of a digital signage screen inside the waiting area is. The majority of them ranked 'for educational purposes' as number one as the purpose of the digital screens in the waiting area, followed by 'for escapism/ distraction purposes'. Others reported that the screens in the waiting area were neither 'for esthetics purposes' nor 'for entertainment purposes'.

Meanwhile, further insights were gathered from the respondents in order to get their overall waiting and digital signage experience. The concluding survey questions in this section served as a follow-through to get a deeper understanding of their survey answers.

The responses from these concluding survey questions that required text-based answers were summarized below:

"Based on the above answers, why did you choose that as your number 1? Number 4?":

In reference with the survey question about choosing which 'purpose' best fits the digital signage screens in a waiting room, the respondents chose 'for educational purposes' because they reported that the function of the screens were for providing health news and other health-related content.

On the other hand, they reiterated that the screens had no relationship to the 'entertainment' nor 'esthetics' purposes since they reported the screens were also used for distraction to influence reduced waiting anxiety.

"Kindly choose your overall waiting experience through digital signage screens and explain why is that your overall experience:":

All of the respondents reported that they were more likely to stay in the waiting area because of the digital signage and its content displayed in the area. Based on their responses, they would rather look or watch the screens on the waiting area instead of not getting distracted due to the anxiety produced by waiting.

It is also noted that Respondent 5 reported in the survey answers that

"The overall experience is great especially at my age that I am happy to see technology around the waiting environment."

This echoed Respondents 6 and 7's views on the digital signage screen, stating that this technology was crucial to changing the experience in the waiting environment that is stressful and giving anxiety:

(1) "My overall experience is fine; the environment is very friendly and easy to navigate. [Technology] really helps patients and visitors to

adapt into a waiting experience and lessen anxiety since technology distracts our attention"

(2) "Overall experience, i would say, would be good. the digital signage screen is helpful for keeping my mind at ease and makes my waiting experience better"

<u>"Is there anything you want to add? What should I have asked you about digital signage and your waiting area experience that I did not ask?"</u>:

Much about the insights in this part of the survey were about the functionality of the digital signage screens and how the function influences its perceived performance in the waiting environment. Respondents 3 and 4 reported the interactivity aspect of the digital screen that may add value to both waiting and digital signage experience:

(1) "The interactivity aspect of the screen should be looked at by the tech department. Or maybe invest [in] an app that could be connected to my appointment, regular health news, and something like using my phone to scan a barcode on the digital screen to see my medical history. But right now i appreciate the informative/ educating component of the digital screen"

(2) "It would have been nice if the screens [were] interactive (like touchscreen of some sort) since they just simply flashed info. I believe this would maximize the usage of the screen plus I think the hospital needs a space for this kind of digital interactive environment"

Meanwhile, Respondent 7 also pointed out that this type of alteration in the waiting environment might be dependent on the demographics of the visitors:

"I think it is important to ask whether patients or visitors feel the waiting experience is better when there are no digital screens at all. some (especially the older ones) might not want too much technology around"

On the contrary, Respondent 2 reported that an environment that is digitally inclined has no effect in his perception of the waiting experience given his age:

> "The screens are informative and for an old guy like me it is important for me to get educated with my health. sometimes it's hard for me to read on the newspaper and I [don't] use my phone very often"

Lastly, Respondents 5 and 6 made comments about how the physical attributes of the digital signage and how the content should fit the waiting area's audience preference on the content:

(1) "Why is it the info flashed on the screen is a bit small and not easily read from afar? I think it would be better to review the visuals of the screen. Anyway, the digital signage overall is perfect for the modern environment of waiting rooms"

(2) "I [don't] see digital signage screens as big as these in other waiting areas I have visited before. Sometimes they look like a TV where I can watch daily shows without sounds, but these ones were pretty unique and looks like it was meant for hospital purposes"

4.2. Data Analysis & Discussion

As previously stated in my study design and methodology, my analysis relies heavily on recognizing categories and themes among the qualitative data I gathered. Using the common practice in qualitative research in a case study approach, I used inductive reasoning to interpret the data together with their respective operational classifications (Saldaña, 2013). In other words, I developed key results areas that summarized both observational and survey findings; meanwhile, statistical analysis was unachievable due to small sample size.

Furthermore, my data interpretation was guided by the operational framework introduced in the previous chapter. I also accounted for the findings I found from the literature and examined these findings to determine relevance on the actual data I acquired for my case study.

4.2.1. Analyzing and discussing the data from the observation (field notes)

The data from the field notes were divided into three areas: the physical environment, the digital signage screens, and the waiting behavior of the participants. Firstly, for the physical environment, most of the information gathered was about the infrastructural design of the waiting area in KEC-NAUC where there was enough space and means for people to spend their waiting time.

This resonates with the concept in the literature that in Point-of-Wait (POW), people within a healthcare setting have the ability to acquire information as much as they want to since most of their time are allotted to doing nothing but wait.

Secondly, the digital signage screens' content flashed on the screen varied from text, video/ images, or videos. There was no consistency on the content format and thus imply different communication effectiveness measures for the viewers. While there was enough number of screens to supply the visitor traffic of the waiting area in KEC-NAUC, this could lead to misunderstanding the overall healthcare communications translated to visitors (Douglas et. al, 2018). In other words, this pertains to inconsistent communication messages and mistargeting the intended or priority audience of a content flashed on the screens.

Lastly, the waiting behavior of the respondents was observed in the lens of their movement within the waiting space. Kelsen (2010) mentioned that in a fast-paced waiting setting, people turn into 'on-the-go' behavior and thus their attention span is not as long as those people who wait in a relaxed setting. I recognized this when I observed that whenever

the screen flashes a text-based content, a viewer looks away and diverts his attention to something else. Most of them pay attention when the content is a video or an image of an infographic. In a setting where assumptions on the POW concepts are seemingly transformed into Point-of-Transit (POT), the content should be adjusted into short-burst (Kelsen, 2010). This means that content should be tailored to the level of attention paid by a specific audience in a specific waiting situation.

Overall, the observation was sufficient enough to grasp a picture of the overall waiting and digital signage experience. The field notes were helpful for both observing the physical waiting area and the screens, however, they had no significant depth in terms of examining the waiting behavior of the respondents. The observation was a great avenue for me to assess the setting, but the 'case' in my study had to be examined thoroughly in order to find the connection between the waiting experience and the digital signage screens.

In this regard, I found that facilitating more than one observation could have given me more insight into the waiting phenomenon without the survey intervention at hindsight.

4.2.2. Analyzing and discussing the data from the survey

To strengthen the analysis from the findings of the observation, I used an inductive approach for categorizing and theming the interpreted data from the survey responses. With the three categories set in my data gathering strategy— involvement, attention, perception— I recognized areas that were similar and opposite among the qualitative data. A limitation of my analysis, however, is that the number of respondents was insufficient as data collection was cut short due to the pandemic. No quantitative analysis was carried out due to the small sample size.

Meanwhile, the results for this small-scale analysis may be useful to guide a larger scale of research efforts in future. That being said, instead of conducting data coding, the information gathered were unitized and analyzed as a collective points-of-view that were intended to discover three key result areas:

4.2.2.1. Visitor's point of view on the relationship between the facility's waiting room environment and the digital signage:

The physical environment of the waiting room and its components created a huge impact on the respondent's perception on the overall healthcare experience. Digital technologies found in the healthcare setting were found beneficial in terms of mitigating a distressed and gloomy healthcare environment (Mixson et. al, 2016). In other words, KEC-NAUC as a primary healthcare setting reinforces healthcare waiting experience by using digital signage screens as tools for alleviating the negative atmosphere brought by waiting anxiety, among others.

Moreover, this aligns with Douglas et. al (2018) and Underwood et. al (2018) suggesting that the concept of a "comfortable" infrastructural design of a waiting setting makes its environment more friendly and more technologically-advanced; the presence of technology-enabled devices (such as the digital signage screens in KEC-NAUC) enhances the atmosphere of the waiting area, hence some respondents reported that (1) the waiting environment was friendly; (2) most answered in the survey that one of the main reasons why they stayed there is for 'relaxation'; and (3) the digital signage screens enhanced the atmosphere of the waiting area.

Meanwhile, it is also important to acknowledge that the respondents' length of stay in the waiting area and the length of their 'viewing time' (a.k.a. watching the

digital content on the screens) are huge factors in analyzing the effectiveness of both digital signage and waiting experiences. Content recall or recognition, as also explained in Holler et. al (2009), is crucial to busy settings like KEC-NAUC healthcare facility since the overlapping assumptions on the Point-of-Wait and Point-of-Transit concepts are still undetermined; this leads to another research question that may cover the effectiveness of health information dissemination in digitally-enabled waiting environment in primary healthcare settings.

4.2.2.2. Waiting with Digital Technology Around the Area: Distraction, Anxiety Reduction, and Education

In Lang (2012), it was stated how healthcare industries are transforming their customer experience strategies by integrating technology to measure customer satisfaction. Customers (visitors) in the healthcare experience are ensured of better service such as reduced anxiety from waiting. The results from the survey implied how respondents were less distracted from thinking too much about their appointment with the doctor, and thus reported that their waiting anxiety was lessened. With this, one reason is being able to adapt in an environment where there is digital technology, or in the case of KEC-NAUC the digital signage screens around the area.

In other words, the survey results appear to confirm claims in the literature that making digital technology visible in the visitors waiting area makes the environment more attractive and creates a better "perceived" healthcare experience (Douglas et. al 2018; Mixson et. al 2016).

Meanwhile, the survey respondents also reported that the digital signage screens in particular served as tools for distraction; both waiting experience and digital signage experience are linked to the 'emotional experience' of visitors in a primary healthcare facility (Rogers et. al, 2016). Simply put, the digital signage experience and the waiting experience both influence the level of attention and the kind of involvement of the respondents. This means that feelings of distress, anxiety, and distraction are key metrics to factor in with regard to measuring visitor satisfaction (emotional experience) in a healthcare setting.

On the other hand, it is interesting to know respondents' shared perspective on digital signage screens; they reported that the screens reduced their waiting anxiety and increased waiting distraction through educational purposes (i.e. sitting in the area and watching health information). This is in contrast with the findings in the literature review wherein DST in healthcare settings (settings that are presumably functioning as Points-of-Wait) has an assumed role for esthetics purposes only (a.k.a. for atmospheric background reasons).

That being said, the waiting area in KEC-NAUC tends to develop a digital connection between the people who wait and the waiting experience itself, and the screens were not just seen as tools to add beauty to its physical waiting environment. By the means of the digital signage screens where customer communications is enabled, the phenomenon leads to the 'environment of learning'— a term used in Thomas (2018). In other words, aside from relaxation and distraction, education was also a key component of the digital signage experience of the respondents.

4.2.2.3. An environment of learning and the demand for interactivity between technology and the visitors

Findings from the survey revealed aspects where waiting experience and using digital signage in a primary healthcare were more than just for relaxation and distraction. Setting up digital signage screens in a waiting room like KEC-NAUC created an environment of learning, in which visitors reported that the health information they acquired from the screens was educational, valuable, and informative content.

In this case, a strategy that seems to be present in the visitor satisfaction measures is related to the patient-centered talking styles (Lang, 2012); findings from the survey imply that there is an opportunity to tailor-fit content specific to a waiting audience and their waiting behavior by creating healthcare communication content that promotes interaction between the communication medium and the user (visitors). That being said, transforming the way digital signage content is communicated to primary healthcare visitors may increase both waiting and digital signage experience involvement and attention.

On the other hand, healthcare environments usually use digital signage technology for functions to improve operational systems (internal communications) rather than to enhance a patient-healthcare experience by providing customer service; this opposes the results from the survey that the use of digital signage screens leans towards external communications such as KEC-NAUC digitally connecting with its visitors.

Using digital signage screens as tools for external communications relates to their interactivity element (Alt et. al, 2013); respondents suggested that the screens

could be integrated with touchscreen technology or an app-based digital signage screen. Altering the main functionality of the current digital signage screens in KEC-NAUC may increase both levels of involvement and attention of the visitors in the waiting area. In other words, aside from using them for educational or distraction purposes, they may also function as tools for visitor engagement to promote better healthcare waiting experience.

It is important to recognize that this analysis has its limitations. I had not met the target number of survey respondents to get the data from, hence data triangulation and coding were not used. Instead, as suggested by Denscombe (2010) and Campbell et. al, (2013), I employed inductive reasoning as an approach to qualitatively analyze the data, and unitize them based on categories and themes identifying key results areas. Moreover, numerical data were also analyzed qualitatively by interpreting them as implications for cross-analyzing the literature. No statistical analysis was used for the research as it has a small sample size.

In addition, using flexible methods in qualitative research controls bias in data analysis and strengthens data transparency (Golafshani, 2003). In other words, with this suggestion, additional methods were carried out to further promote validity and reliability of the research analysis: (1) researcher bias was minimized in order to comply with an objective research analysis; and (2) accounted data from the limited number of respondents was summarized and interpreted using categorization and theming methods instead of triangulation and coding.

4.3. Summary of Findings, Recommendations, & Research Limitations

In summary, the research findings are plotted to the operational framework of my research design. The diagram below explains the kind of involvement the respondents are doing while

viewing the digital signage in the waiting area, and their level of attention paid in viewing the digital signage screens. The diagram below also shows respondents' general perception of their digital signage experience while waiting:

Research Summary (KEC-NAUC Participants)

The waiting setting:
Kaye Edmonton Clinic- NAUC

A. Involvement [NV]:
- waits > an hour, 2x/ month
- regular visit, sit, relax, watch news
- "waiting area was relaxing & quiet"
- aware of the Dsscreens
- "DS enhanced the atmosphere of the waiting area"; prefers no audio

B. Attention [NV]:
- sometimes look at the DS
- "overall appearance of waiting area was good"
- "DS adds attractiveness & is relevant to waiting experience"
- "DS are strategically placed"; the size of the screen is okay
- "DS distracts me from waiting anxiety"
- "Better if DS is interactive"; "I use other device while waiting"
- "DS makes the waiting area look modern
- "DS should flash more health info content"

C. Perception[NV]:
- prefers images/ pictures, videos w/o audio
- "DS content is good"
- ranked "education" as no. 1 purpose of the DS, followed by "escapism"
- "the purpose of the screens were to educate the visitors"
- "I am more likely to stay in this area because of the DS"
- "DS could be interactive to maximize the use of the screens"

1. demands for short-burst content; DS screens reduces negative atmosphere of KEC-NAUC; DS makes the waiting are more comfortable, friendly, and tech-advanced
2. DS experience is linked to emotional experience (less anxiety and distress); bridge the digital connection between visitors and KEC-NAUC waiting environment
3. DS creates an environment of learning; demands for content focused on patient-centered styles; asks for interactivity and user-experience

Education   Escapism

Legend:

| main activities KEC-NAUC visitors do in the 'experience' setting | KEC-NAUC visitors' response to participation and/ or acquisition of digital signage 'experience' while waiting | waiting experiential dimensions of KEC-NAUC as a healthcare setting |

Fig. 8. Research Summary (Cordero, 2020)

The waiting and the digital signage experience as reported by respondents in this study suggested that digital signage screens in the KEC-NAUC setting enhanced the atmosphere of the area, added attractiveness to the setting, and were relevant to the waiting experience. As such, the presence of the digital signage screens may be a factor in reducing the waiting anxiety of the visitors and providing opportunities for patient education.

Results implied that digital technologies adapted in a healthcare setting like KEC- NAUC made it perceived as more friendly and more comfortable to its visitors. This is linked to both cognitive and emotional experience of the visitors, in such that their evaluation of the waiting

experience is positively influenced by how they perceive their digital signage experience and how they acquire digital signage information in the healthcare setting. Meanwhile, user experience (interactivity) was also suggested as one of the factors that may increase visitor engagement and involvement; customer-centered communications strategy is crucial to both digital and waiting experiences.

The research, however, has limitations that are related to the scope of the project and the data collection method. Visitor traffic, the amount and length of flashing the content on the screen, and visitor's willingness to interact with the screens are just some of the variables that may be considered for future research. Cross-analysis of data instruments should also be recognized since this research was only meant for a specific audience and setting. Results in this study have no generalizable conclusions outside the AHS KEC-NAUC context. However, the research design, strategy, and framework may be used as templates for further case studies of facilities internal to the AHS organization, and for future research efforts in a larger-scale sampling.

In the next and final chapter, the research concludes with providing the purpose of the study, the context of the research findings, the recommendations for further research efforts, and the summary of research implications.

CHAPTER FIVE: CONCLUSION

Developing an appropriate communication strategy to translate 'the healthcare experience' is crucial for healthcare organizations. Specifically, healthcare visitors' waiting experience plays an important role to the perceived healthcare brand. That being said, the environmental attributes of a healthcare setting influence the waiting experience of its visitors; literature implies that a healthcare setting is a complex waiting environment that requires digital technology to its infrastructural design. The use of DST has advantages in order to achieve a better healthcare waiting experience. My research explores the DST and the waiting experience of healthcare visitors in terms of their attention to, involvement in, and perception of DST experience in waiting.

To reiterate the previous chapters, the fields of healthcare and technology work together with communications in its core. The challenge, however, is understanding how healthcare as a waiting setting demands for a communications & digital technology strategy that matches a complex audience. Although there are existing literatures that talk about communications & digital technology in healthcare as a general field, little is still known about why implementation of communications & digital technology strategies should be specific to a healthcare waiting audience. That being said, my research question aims to discover the digital technology experience of healthcare visitors inside the waiting area of a chosen healthcare facility.

In this chapter, I explain the key findings from the case study, how these findings are significant to my research question, and how these findings contribute to the literature in healthcare, communications, and technology fields. By putting the findings into context, I further explain in this chapter how the results from the case study are essential to future research efforts. Scope and limitations, as well as research implications and recommendations are also discussed in this chapter. Future directions for this research are also included in this chapter.

5.1. Summary of Findings

The key findings from the case study are drawn out from two data gathering strategies which are field observation and survey questionnaire. With the analysis of these findings, the case study implies that digital signage technology enhances visitors' waiting experience, reduces visitors' waiting anxiety, and influences visitors' education. Additional key findings are also found in the case study; results imply that (1) adding digital technology in a healthcare environment make it perceived as 'comfortable' and 'friendly'; (2) the waiting experience is linked to cognitive and emotional experience of a healthcare visitor; and (3) visitor experience demands for 'interactivity' as an element or attribute of digital signage technology.

In line with the research question which is identifying what is the digital signage experience of visitors inside the waiting area of a healthcare facility, the importance lies in the implication that there is an opportunity to tailor-fit a digital technology strategy that meets an audience's experience and communication needs.

5.2. Findings in Context

The findings in this case study contribute to the literature in communications, healthcare, and digital technology. Despite claims saying digital technology is a one-size-fits-all tool for healthcare settings, the literature analysis and the findings from the case study imply that digital technology could be used in various ways to communicate 'the healthcare experience'.

A healthcare setting is a complex waiting environment for its visitors; implementation of digital signage technology for its environmental design should be customized based on the needs of its audience. Simply put, this brings for future research purposes considering factors such as visitor traffic, the amount and length of flashing the digital content on the screen, and visitor's willingness to interact with the screens.

Lang (2012), Saffarania et., al. (2012), Alt et., al. (2013), Mixson et., al. (2016), Rogers et., al. (2016), Douglas et., al. (2018), Underwood et., al. (2018), and Thomas (2018) — this set of literatures may have alternative interpretations of my study findings since the design and methods used are not similar with what they used. Although their implications are well-aligned with my research analysis, it would be interesting to know what future research interpretations look like in terms of the variables mentioned in the former paragraph.

5.3. Future Direction

This study has its limitations related to scope, data collection, and analysis. Due to the COVID-19 pandemic in 2020, both recruitment and sampling were affected resulting in limited data. Despite this, existing research guidelines were found helpful in pursuing the data collection and analysis of the case study. However, future research efforts should consider protocols on facilitating this kind of research amidst a public health situation. Data gathering that is contactless (i.e., using online or digital platforms) may be one of the ways to address the aforementioned limitations.

As the recommendations of this case study point out, the results make a modest contribution to the overall healthcare field. However, the design, strategy, and framework may be used as templates for further case studies, and for larger-scale sampling. For instance, future research may consider understanding the significance of visitor traffic to the waiting experience or the relationship of digital communications and healthcare participation.

5.4. Conclusion

This study explores the waiting experience in an environment with digital signage technology. The literature analysis is put into context to conduct a case study of a healthcare

facility. Using qualitative research methods, it is found that digital signage technology influences a visitor's waiting experience in terms of anxiety reduction, education, perception, emotion & cognition, and participation. These implications contribute to the wider literature in terms of future research efforts including variables such as communication content effectiveness and visitor traffic.

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APPENDICES

Appendix A: Literature Review Road Map (Detailed Version)

Literature Review: Road Map

using digital technology for customer experience

- convenience
- reduced transaction cost
- better media communication production & distribution
- positive effects on customer dynamics
- participatory & engaging
- promotes brand/ service loyalty

Gap: *"What is/ are the specific strategies used to provide better digital experience?"*

Digital Signage Technology (DST) strategies in various settings

- has 3 points (POS, POT, POW)
- POS focus of research talks about influencing people to purchase something
- POT focus of research talks about people using DST for communication effectiveness
- POW focus of research talks about increasing people's information awareness and digital environment adaptation
- all three points focus on digital experience particular to customer experience

Gap: *"What is 'experience' and where is healthcare communications?"*

the 'Experience Economy' & healthcare customer communications

- Pine & Gilmore
- modifying experiential consumption
- urban leisure format (ULF); leisure/ pleasure equals positive experiential values
- expectation-confirmation theory (ECT); pleasure and satisfaction in experience are results of cognitive-affective environmental experience
- changing environmental design in healthcare produces positive experiential values

Gap: *"What is the (waiting) experience in a general healthcare context?"*

the waiting experience & the psychology of waiting behavior in healthcare settings

- healthcare organizations are starting to modify customer communications for patient satisfaction
- healthcare environment should adapt a 'friendly' environmental-spatial design
- emotional experience while waiting is attached to physical environment of a healthcare facility
- patient satisfaction while waiting equals positive perception on healthcare service
- overall healthcare experience involves 'efficient patient waiting time' as a metric for a better customer service
- environmental attributes of a facility should be patient-centered
- visual communications is vital to waiting experience in a healthcare setting
- healthcare communications intervenes waiting experience resulting to increase in healthcare participation of individuals

Gap: *"What characteristics/ components of digital technology (digital screens to be specific) are the ones responsible for influence waiting behavior?"*

the science behind digital screens

- communication technology controls cognitive experience
- digital screens involve three things on recall and recognition: increased awareness, positive experience, and perceived improved communication
- digital screens with interactivity feature increase information retention of viewers
- the cognitive effect produced by digital screens has something to with decision making
- digital screens result to the feeling of 'comfort' while waiting
- high-resolution graphics in digital screens result to perception on 'realness' and 'beauty'
- pervasive communication tools such as digital screens capitalize on three things: illumination, spatiality, temporality
- visual experience is manipulate by the physical attributes of the digital screen
- macro-perspective effect of visual manipulation may result to perceived better brand service, and customer experience

Gap: *"What is the implication of this in an existing healthcare environment?"*

Appendix B: Research Instrument (Survey Consent & Survey Questionnaire)

Survey Consent

Welcome to the survey of my research study *The Digital Signage Technology & The Waiting Experience: A Case Study of a Healthcare Facility.*

With the vision of providing a better waiting experience for AHS stakeholders, I am interested in your opinions, perception, and experience inside an AHS facility waiting area while viewing digital signage screens.

The survey will take approximately 10 minutes to complete. Your participation is voluntary and your answers will be kept confidential. All responses will be compiled together and analyzed as a group. No personal information will be collected from you, and the information that you will share will remain anonymous and will be stored in a password-protected database. Data will be used solely for the purposes of this research.

<u>Completing the survey is your consent to participate</u>. You are neither forced nor obliged to answer any specific questions; you have the option to skip questions and/ or end the survey at any moment. You may have your collected data destroyed and withdrawn from the study within the five (5) days following your participation.

More information about the research and the researcher is provided below:

Title of the study: The Digital Signage Technology & The Waiting Experience: A
                                 Case Study of Healthcare Facilities

Principal Investigator(s) :   Cedric Cordero
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The Researcher will comply with the University of Alberta Standards for the Protection of Human Research Participants, *https://www.ualberta.ca/research/support/ethics-office/forms-cabinet/forms-human.*

Purpose of the Study: From this research I wish to explore why a healthcare waiting area uses digital signage to enhance the waiting experience of its customers and to supplement waiting behaviors. The study is in partial fulfillment of the Master of Arts in Communications and Technology degree for Cedric Cordero, and not initiated by Alberta Health Services.

Benefits: There is no direct material benefit expected in this study. However, I hope the findings from this survey will add knowledge to the use of digital signage technology used in a healthcare environment. The survey data will inform the researcher the communication needs of AHS service quality for healthcare stakeholders such as patients/ clients, visitors, and staff/ employees.

Risks: There is no foreseeable risk to your participation in the study.

Data Storage: Paper surveys will be kept in a locked filing cabinet in the office of the supervisor and/ or in the researcher's files at the University of Alberta for a minimum period of 5 years. Electronic copies of the survey will be encrypted and stored in a password-protected computer in the department of Communications & Technology— Faculty of Extension at the University of Alberta, and in the researcher's personal computer storage and flash drive.

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have any questions regarding your rights as a research participant or how the research is being conducted you may contact the Research Ethics Office at 780-492-2615.

Survey Questionnaire

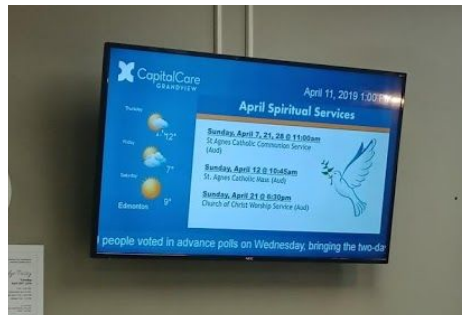**Date of completing the survey: _____**

Please select one: I am a ____ patient/ client
                                  ____ visitor
                                  ____ staff/ employee
                                  ____ Other, please specify: _____

Which category below includes your age?
        17 or younger
        18-20
        21-29
        30-39
        40-49
        50-59
        60 or older

Researcher's Notes: *A digital signage is a TV-like screen displayed on the walls of waiting areas in AHS facilities. An example of a digital signage is shown below:*

Directions: *Please choose the letter of your answer.* Note: *some questions will require you answering in text-form. Please write your answers on the space provided.*

1. How many **times within this month** have you visited this waiting area?

        a. once
        b. twice
        b. 3 times and more

    1.a. On average, how **many hours** do you **stay in this waiting area**?

        a. less than an hour
        b. 1-3 hours
        c. 4 hours and more

2. Are you **aware** there is **a digital signage screen located** in the waiting area?

        a. Yes
        b. No
        c. Maybe

    2. a. If you answer YES, how much of your **waiting time is spent** looking at the screen?

a. I frequently look at the screen while waiting.
b. I sometimes look at the screen while waiting.
c. I rarely look at the screen while waiting.
d. I never look at the screen while waiting.
e. I am unsure.

2.b.Why do you stay in the waiting area and what do you do if you are not looking/ watching the digital signage screen?

_____

_____

3. In terms of **its atmosphere**, how would you rate this waiting area?

a. Relaxing   b. Somewhat relaxing   c. Neutral   d. Somewhat stressful   e. Stressful

3.a. Do you think a **digital signage screen enhances the atmosphere** of the waiting area?

a. Yes
b. No
c. Unsure

4. In terms of **noise**, how would you rate this waiting area?

a. Quiet/ Calm   b. Somewhat quiet/ calm   c. Neutral   d. Somewhat loud   e. Loud

4.a. Do you think the digital signage screen in the waiting area **should have sounds/ audio**?

a. Yes
b. No
c. Unsure

5. In terms of **its appearance**, how would you rate the background/ physical environment of this waiting area?

a. Very Good   b. Good   c. Neutral   d. Satisfactory   e. Needs Improvement

5.a. Do you think a **digital signage screen adds attractiveness** to a waiting area's physical environment?

a. Yes
b. No
c. Unsure

5.b. If you answered YES to the above question, how would you rate the overall relevance of installing a digital signage inside a waiting area?

a. Very Good   b. Good   c. Neutral   d. Satisfactory   e. Needs Improvement

5.c. If you answered NO, why do you think it is not relevant?

_____

_____

6. Overall, what is/ are your **reason/s for staying in this waiting area**? (please encircle all that applies to you):

       a. regular visit to a patient
       b. to sit and relax
       c. to eat and use my phone (or other electronic devices)
       d. to watch/view the digital signage screen
       e. other, please specify: _____

    6.a. If you encircled (D) in the above question, how do you feel about waiting inside the area while viewing the digital signage screen?

    _____
    _____

7. What is it about this waiting area that appealed to you the most? What benefit or advantages did you think you get from waiting there?

    _____
    _____

8. How did you notice the digital signage screen located in the waiting area?

    _____
    _____

    8.a. What do you get from watching/ viewing the digital signage screen while waiting?

    _____
    _____

9. In terms of **content displayed on the screen,** what do you prefer? (encircle all that applies):

       a. text-based content
       b. images/ pictures
       c. videos (without audio)
       d. video (with audio)
       e. not sure

    9.a. How would you rate the **relevance** of the digital signage content presently displayed on the screens in this waiting area?

    a. Very Good   b. Good   c. Neutral   d. Satisfactory   e. Needs Improvement

    If you think that the content flashed on screen are irrelevant, please explain why:

    _____
    _____

10. What do you think is the **purpose** of the digital signage screen in this waiting area? (Choose only one that best fits you):

       a. The purpose of the screen is to entertain me while waiting.
       b. The purpose of the screen is for me to get educated about health-related information.
       c. The purpose of the screen is for esthetics/ physical beauty of the waiting area.
       d. The purpose of the screen is to divert my attention and reduce anxiety while waiting.

11. Based on your preference, please rank the following in terms of the role of a digital signage screen inside the waiting area: (1 being the highest rank, 4 being the lowest rank)

        ____ for entertainment purposes
        ____ for educational purposes
        ____ for esthetics purposes
        ____ for escapism/ distraction purposes

   11.a. Based on the above answers, why did you choose that as your number 1? Number 4?
_____
_____

12. Kindly choose your overall waiting experience through digital signage screens:

   a. I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.
   b. I am less likely to stay in this waiting area because of the digital signage and its content displayed in the area.
   C. Digital signage is unimportant to my stay in the waiting area.

  Based on you answer above, why is that your overall experience?:
_____
_____

13. Is there anything you want to add? What should I have asked you about digital signage and your waiting area experience that I did not ask?
_____
_____

----------------------------*end of survey*-------------------------------

Appendix C: Consolidated data (Respondent Involvement)

Survey Question:	P1	P2	P3	P4	P5	P6	P7
How many times within this month have you visited this waiting area?	twice	once	twice	three times or more	twice	twice	twice
On average, how many hours do you stay in this waiting area?	1-3 hours	less than an hour	less than an hour	less than an hour	1-3 hours	less than an hour	less than hour
Are you aware there is a digital signage screen located in the waiting area?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
In terms of its atmosphere, how would you rate this waiting area?	Relaxing	Somewhat Relaxing	Neutral	Relaxing	Relaxing	Relaxing	Relaxing
Do you think a digital signage screen enhances the atmosphere of the waiting area?	Yes	Yes	yes	Yes	yes	yes	yes
In terms of noise, how would you rate this waiting area?	Quiet/ Calm	Quiet/ Calm	Neutral	Quiet/ Calm	Quiet/ Calm	Quiet/ Calm	Quiet/ Calm
Do you think the digital signage screen in the waiting area should have sounds/ audio?	No	No	Yes	No	No	No	No
Overall, what is/ are your reason/s for staying in this waiting area? (please encircle all that applies to you):	regular visit, for relaxation	regular visit	to sit and relax, to eat and use my phone	regular visit, to relax, and to watch health news	to sit and relax, to watch the screen	to sit and relax, watch the screen	regular visit, to sit and relax

Appendix D: Consolidated data (Respondent Attention)

Survey Question:	P1	P2	P3	P4	P5	P6	P7
If you answer YES, how much of your **waiting time is spent** looking at the screen?	I sometimes look at the screen while waiting.	I frequently look at the screen while waiting	I frequently look at the screen while waiting.	I sometimes look at the screen while waiting.	I sometimes look at the screen while waiting.	I sometimes look at the screen while waiting.	I sometimes look at the screen while waiting.
Why do you stay in the waiting area and what do you do if you are not looking/ watching the digital signage screen?	I came here with someone and had no place to go. I use my phone while not looking.	waiting for my name to be called	To not miss my turn, I am using my phone	I have to wait here for my doctor's appointment. I bring my laptop or phone to kill time.	It is quiet here and I can relax with my wife.	I stay here since its just a short visit usually, and i would say the seats and the ambiance are great. I use my phone when I dont look at the screen	I wait here for my appointment and wait for my number to be called. I bring my newspaper since there are no papers here.
In terms of its **appearance**, how would you rate the background/ physical environment of this waiting area?	Very Good	Good	Good	Good	Very Good	Very Good	Very Good
Do you think a **digital signage screen adds attractiveness** to a waiting area's physical environment?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
If you answered YES to the above question, how would you rate the overall relevance of installing a digital signage inside a waiting area?	Good	Good	Good	Good	Very Good	Good	Good
If you encircled (D) in the above question, how do you feel about waiting inside the area while viewing the digital signage screen?	---	---	---	I feel distracted and lessens my anxiety while waiting for my turn since I am focused on the screen.	It is comfortable waiting here; i dont see any magazine or newspaper but thats okay since i can watch the digital screen	I think it would be better to use the screen for interaction (like navigation, knowing other hospital facilities) like you know, a big digital board of hospital map (or even edmonton map)	---
What is it about this waiting area that appealed to you the most? What benefit or advantages did you think you get from waiting there?	There is internet connection and I get to watch the screen when bored. I get informed, too, because of info flashed on screen.	Showing to where the [doctor's] booth [is]	It is a bit uncomfortable here	The environment looks very modern as compared before when waiting areas look like plain white walls. I think it is really important to provide health-info on the screen while waiting, it's worth my time and reduces anxiety.	It is the atmosphere that appealed to me the most. it makes me think of something else and not worry too much about my appointment with the doctor	The ambiance is great and waiting here helps me not to think about the appointment too much	Honestly the environment is calm, no one is talking too loud despite the space is big.
How did you notice the digital signage screen located in the waiting area?	They are everywhere...	First when I enter the reception	It is an obvious thing to notice	They are placed on each pillar/ booth where you wait for your doctor's room.	They are quite big to notice so you can see it easily	they are on located on the side of the booth so it's easy to notice	When I was called by the staff for my turn
What do you get from watching/ viewing the digital signage screen while waiting?	Doctor's name and where to wait for my cousin	Health information	Details about my appointment and some health information	health info, news, appointment number, and basic daily info such as weather and temperature	Relaxation and information	my doctor's name, which area in the waiting room to sit, information related to health	I see the my doctor's name and basic health info about prostate health

Appendix E: Consolidated data (Respondent Perception)

Survey Question:	P1	P2	P3	P4	P5	P6	P7
In terms of **content displayed on the screen**, what do you prefer? (encircle all that applies):	images/ pictures, videos	text-based content	images/ pictures	images/ pictures, videos without audio	text-based content, images/ pictures, videos with audio	images/ pictures, videos without audio	images/ pictures
How would you rate the **relevance of the digital signage content** presently displayed on the screens in this waiting area?	Neutral	Good	Good	Good	Good	Good	Good
If you think that the content flashed on screen are irrelevant, please explain why:	More health info and not just about prostate health	---	---	---	---	---	---
What do you think is the **purpose** of the digital signage screen in this waiting area? (Choose only one that best fits you):	The purpose of the screen is for me to get educated about health-related information.	The purpose of the screen is for me to get educated about health-related information.	the purpose of the screen is for me to get educated about health-related information	The purpose of the screen is for me to get educated about health-related information.	the purpose of the screen is for me to get educated about health-information	The purpose of the screen is to divert my attention and reduce anxiety while waiting.	the purpose of the screen is to divert my attention and reduce anxiety while waiting.
Based on your preference, please rank the following in terms of the role of a digital signage screen inside the waiting area: (1 being the highest rank, 4 being the lowest rank): for entertainment purposes, for educational purposes, for esthetics purposes, for escapism/ distraction purposes	2, 1, 3, 4	3, 1, 2, 4	2, 1, 4, 3	3, 1, 4, 2	4, 1, 2, 3	4, 2, 3, 1	4, 2, 3, 1
Based on the above answers, why did you choose that as your number 1? Number 4?	1 - educational, content on screen was more informational than leisure; 4 - escapism, I can get distracted with other devices though	Give more health info	It is educational as it gives health information. It also helped me to be distracted and to be less anxious with my appointment.	1 and 2 are closed fight since I think they share the same idea (to educate and distract me); I dont think it is much about making the waiting room esthetically appealing since the atmosphere in the waiting area is already relaxing, calm, and clean	the screen helps me educated about health news and the content is informational; i dont think it is for entertainment reasons due to the former fact	I think the screen helps me get distraction and not think too much, it is nothing about entertainment because it's not like I'm in a mall or a store where i would have to be 'entertained'	the things flashed on the digital screen isnt much about leisure but more of info to reduce your waiting anxiety
Kindly choose your overall waiting experience through digital signage screens:	I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.	I am more likely to stay in this waiting area because of the digital signage and its content	I am more likely to stay in this waiting area because of the digital signage and its content displaed in the area.	I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.	I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.	I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.	I am more likely to stay in this waiting area because of the digital signage and its content displayed in the area.
Based on you answer above, why is that your overall experience?:	Relaxing and just fine	informative	The digital signage helped in a lot of ways and its better to it than not.	waiting experience there is good and relaxing. though i have phone with me, but i feel like not using it anymore since I can watch on the screen anyway	the overall experience is great especially at my age that I am happy to see technology around the waiting environment. I remember waiting room before hasnt been like this since early 2000's i think	My overall experience is fine; the environment is very friendly and easy to navigate. technology really helps patients and visitors to adapt into a waiting experience and lessen anxiety since technology distracts our attention	overall experience, i would say, would be good. the digital signage screen is helpful for keeping my mind at ease and makes my waiting experience better
Is there anything you want to add? What should I have asked you about digital signage and your waiting area experience that I did not ask?	There should have been questions about touch screens and its relevance with healthcare environment.	the screens are informative and for an old guy like me it is important for me to get educated with my health. sometimes it's hard for me to read on the newspaper and i dont use my phone very often	the interactivity aspect of the screen should be looked at by the tech department. or maybe invest on an app that could be connected to my appointment, regular health news, and something like using my phone to scan a barcode on the digital screen to see my medical history. but right now i appreciate the informative/ educating component of the digital screen	it would have been nice if the screens are interactive (like touchscreen of some sort) since they just simply flashed info. i believe this would maximize the usage of the screen plus I think the hospital needs a space for this kind of digital interactive environment	why is it the info flashed on the screen is a bit small and not easily read from afar? I think it would be better to review the visuals of the screen. anyway, the digital signage overall is perfect for the modern environment of waiting rooms	I dont see digital signage screens as big as these in other waiting areas I have visited before. Sometimes they look like a TV where I can watch daily shows without sounds, but these ones were pretty unique and looks like it was meant for hospital purposes	I have nothing to add, but if I were to ask another question for this research, I think it is important to ask whether patients or visitors feel the waiting experience is better when there is not digital screens at all. some (especially the older ones) might not want too much technology around