UNIVERSITY OF GHANA

GROWING TREND OF HEALTH INFOMEDIARIES IN DEVELOPING ECONOMIES: UNDERSTANDING MOTIVATIONS, AFFORDANCES AND CONSTRAINTS

BY

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DECLARATION

I do hereby declare that this thesis is the result of my own research and has not been presented by anyone for any academic award in this or any other university. Wherever contributions of others are involved, every effort has been made to indicate this clearly, with due reference to the literature and acknowledgement of collaborative research and discussions.

I therefore bear responsibility for any shortcomings.

…… ……

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CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

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(Co-Supervisor)

DEDICATION

I dedicate this work to the Almighty God who granted me life, strength, knowledge and wisdom to enable me do this research. I also dedicate this work to my lovely parents (Pastor & Mrs. A. A. Boateng), my husband (Chris Kwaku Kwandahor) and wonderful children (Michaela, Karen, Ethan & Emily) not forgetting my dearest sister (Mary) for their unflinching support to achieve more in life against all odds I say God bless you all for your endless love, support and encouragement.

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LIST OF ABBREVIATIONS

OHIS	**Online Health Information Seekers**
TACT	Technology Affordances and Constraints Theory
IT	Information Technology
OHC	Online Health Communities
OHIP	Online Health Information Platform
IS	Information Systems
GHN	Ghana Health Nest
GHOL	Ghana Health Online
APP	Applications

ABSTRACT

Information Technology (IT) plays a key role in health care management. Over the years, numerous IT artifacts have been introduced to improve health care delivery and access. These artifacts are often largely under the control of health professionals with little or no patient involvement. Recently however, there is a growing phenomenon of user-controlled health IT artifacts that give direct power and control to its users. One of such health IT artifacts are so-called infomediaries which augment decision making of patients, caregivers, and healthcare providers by creating awareness and knowledge sharing of healthful living, wellbeing and wellness among Online Health Information Seekers. There has been a pragmatic development of health infomediaries recently on online media platforms including conventional web portals (like websites, online forums, and chat rooms), social media, mobile Apps and blogs. Considering the rate of use of infomediaries, there are research gaps that need to be addressed, especially to understand the factors that enable the setting up of infomediaries as well as the affordances and constraints. In light of this, Technology Affordance and Constraint Theory was chosen as a theoretical lens to investigate the motivational factors, affordances and constraints behind the establishments of health infomediaries in a developing economy where challenges to health care access and delivery make health infomediaries potent alternatives to health information access. The study used the critical realism paradigm, qualitative research methodology and a case study research strategy to explore the phenomenon.

The findings revealed that inherent motivation behind the development of online health platform is not necessarily sequential nor predictable but dynamic due to the changing demand of users, thus the development of health infomediaries is relatively purposive. Also, the findings revealed

that there are both intrinsic and extrinsic motivational factors that drive organizations or individuals' mission to establish health infomediaries. Motivational factors for the development of online health platforms are largely datafication and commodification. Datafication employs collective tools, technologies and processes to 'data mine' user data with a view to serving them better through content tailoring. Commodification on the other hand, refers to the way in which user data is transformed into monetary value. In Ghana, infomediaries are more commodification oriented than datafication. In this case study, no evidence was found of infomediaries in Ghana, purposively collecting user data to provide better services or sell the data to other interest parties. Rather, health infomediaries in Ghana apart from providing health information, also advertise and sell health products to consumers. One significant finding was that, some infomediaries even advertise non-health products. It can be inferred that in Ghana, commodification is the main affordance of health infomediaries beyond their primary purpose of providing health information to online health information seekers. The research also found other affordances or action possibilities with health infomediaries in Ghana such as self-aggrandizement, where individuals establishing infomediaries use the medium to promote or make themselves visible to society, possibly for future roles such as pioneer of a health infomediary. In terms of constraints to infomediaries, the research found that the survival and sustenance of online health information platforms is dependent on the management and technical handling of the IT infrastructure. Since most health infomediaries in Ghana are operated by individuals rather than organizations, they tend to lack managerial, financial or technical competencies of maintaining these platforms.

The study offered a considerable understanding to the motivational factors behind the development of health infomediaries. Practically, the study will serve as a guide for practitioners to develop

health infomediaries not only from the individual's motivation but inculcate the consumers' needs. Furthermore, the study advocates for government to institute very effective policies and guidelines and ensure its compliance to achieve an effective publication and use of online health information and development of health infomediaries. The study recommends developers of health infomediaries to identify and also understand the challenges besetting the development of online health platforms. Again, developers of health infomediaries should clearly define the purpose of setting up online health platforms to meet the needs of health consumers. That notwithstanding, commodification of the platform should not override the content related to health. Additionally, developers should be guided by the accepted standards of development of online health platforms. Future research will focus on other actors in the online health information such as regulators and how they perceive issues of privacy and security as well as conflict of interest situations in developing countries.

CHAPTER ONE

INTRODUCTION

1.1 Research Background

With the advent of information technology, healthcare management has gained much transformation with regards to information retrieval and access. Over the years, numerous IT artifacts have been introduced to improve health care delivery and has aided in shifting time and space making information readily available and accessible (Kummervold & Wynn, 2012). These artifacts are however, largely under the control of health professionals with little or no patient involvement. Recently however, there is a growing phenomenon of user-controlled health IT artifacts that give direct power and control to its users who are mainly patients. One of such health IT artifacts are so-called infomediaries. An infomediary, coined for the first time by Hagel III, is an agent who collects information on a specific topic and supplies it in one place (Hagel III and Rayport 1997; Zahedi and Song 2008). An online infomediary is, therefore, an online information provider, which can take various forms, including online discussion forums and web portals (Zahedi and Song 2008). Health infomediaries refers to an online health platform that connect consumers and medical professionals in order to share experience and knowledge for health management (Koch-Weser et al. 2010; Schwartz et al. 2006).

A recent survey conducted in the United States of America (USA) and Canada revealed that over 60 million residents depend on these health infomediaries to obtain health information (Berland, Elliot, Morales, Algazy, Kravitz, Broder, 2013; Edejer, 2000) to augment decision making of healthful living and wellbeing (Hesse, Nelson, Kreps, Croyle, Arora, &Viswanath, 2005). Information technology is increasingly changing the nature of work in organizations as well as

facilitating the communication of information across healthcare teams and groups with the aim to make the delivery of care safer and more efficient (Kathrin, Allison, & Aziz, 2010). According to research conducted by Tustin (2010) in information and communication technology usage in households and by individuals, it was acknowledged that the percentage of internet usage among individuals between the ages of 16 and 74 is determined as 58.5 % while the rate of people using internet on a daily basis or at least two days a week has been reported as 44.9% among these individuals. Presently, majority of the African population have access to the internet than clean water or even good sanitation (Moretti, Oliveira, & Silva, 2012). This is as a result of influx of giant telecommunication companies on the African markets with lots of enticing packages including internet access. Data gathered from the National communication Agency (NCA) of Ghana suggest that, of about 24.97 million population, 24.4 million are mobile phone users while evidence from the Mobile Data Market Trends gathered by the National Communication Agency (NCA) at the end of June 2017 indicated that Ghana has a total subscriber base (mobile phone users) of 14,615,048 (Quarter, 2017).This basically implies that all smart phone users in Ghana can have access to the internet, provided they can afford the data.

Health infomediaries are dedicated sites which provide information on to control communicable diseases, medicine, supplements, lifestyle and examples of such platforms include but not limited to WebMD, Patient UK, Mayo Clinic, and Medline. The growing trend of these dedicated sites has transcended from those with special medical conditions to connect with others, share their experiences, and better understand their treatment options and outcomes.

Health infomediaries offer the user with the flexibility of managing and controlling a health condition and this for consumers/users, helps to avoid long queues (waiting hours) that have been

characteristic health care access in most developing countries (Nternet & Ashington, 2006). Over the years health information were largely under the control of medical professionals who in turn convey health to consumers (Silver, 2015). This change has stimulated opposing perspectives on the role of health infomediaries in improving healthcare delivery. Owing to the growing demand for health information by health consumers and health centres, institutions are responding to the need by developing health infomediaries that serve varied needs of online health information. Health information online can increase knowledge, skills and patient participation in health-related decision-making strategies (Emont, 2011). Health consumers' independent request can supplement and be utilized in medical professional-patient interactions which often become highly time constrained (Gonzalez, Sanders-Jackson, & Emory, 2016). Health consumers can discover or inquire further for answers in a more convenient and secured manner (Fox, Raine, Horrigan, Lenhart, Spooner, Burke, Carter, 2000; McMullan, 2006; Sillence, Briggs, Richard, & Fishwick, 2007). Furthermore, through other web portals, health consumers get to interact with each other to share live experiences (Evers, 2006).

Online health information supports decision making for consumers, caregivers and healthcare professionals. With the advent of health infomediaries, health consumers are able to clarify unknown medical terms used in diagnoses, find support communities and possibly find alternative treatments (Sillence, Briggs, Fishwick, & Harris, 2004). Health consumers can include patients with chronic conditions, who are often expected to manage their diseases on their own between scheduled visits to medical providers such as outpatient clinics; low income patients, who may not have health insurance; and rural patients, who live far away from health centres and may have to resort to personal care (Jacobs, Amuta, & Jeon, 2017). Online health information mostly help

consumers to be better educated about their condition, and furthermore decrease sentiments of dejection and segregation. This turns out to be helpful for consumers who are confined to their home as a result of devastating ailment (Aitken, 2013). Health infomediaries enable consumers to gain more insights about their condition, and, in turn, better manage their condition effectively. The tremendous potentials of health infomediaries have necessitated its integration into government policies on healthcare delivery in many countries (Currie 2009; Currie & Guah 2006).

Information Technology has brought a lot of dynamics into healthcare delivery and access. For example, interactions with health infomediaries go beyond mere health information access and allows consumers to talk and connect to each other (Yim et al., 2015). These discussions and connections on such platforms provide an avenue for consumers to draw inspiration and also acquire new skills in managing either an ailment or controlling a disease (Khuntia et al., 2017).

1.2 Research Problem

In recent years, healthful information has become the driving force behind the usage of the internet especially to those seeking health information. With the increasing availability of online healthful information sources as well as the desire to take more responsibility for health and control costs, a growing number of individuals tend to use health dedicated sites to search for health-related information (Gonzalez, Sanders-Jackson, & Emory, 2016). According to Fox et al., (2000) 61% of an American adult interacts with these health infomediaries in order to obtain vital tips in making strategic decisions. The research revealed most of these searches were related to how to manage and control a particular health condition (Nternet, , & Ashington, 2006). The benefits of using health infomediaries include but not limited to flexibility, availability, confidentiality,

efficient and effective information retrieval ability to tailor information to meet one's needs (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). Research on online health information could improve health care outcomes by reducing disparity in health care and encouraging the active interaction of patients with medical professionals (McMullan, 2006).

Extant literature on online health information has recently gained much publicity in Information Systems (IS) literature. Most of these studies are related to the adoption and impact of health technology from a healthcare consumers' and professional perspective (Anker, Marie, & Hugh, 2011; Gonzalez et al., 2016; McMullan, 2006; Sillence, Briggs, Richard, & Fishwick, 2007; Silver, 2015; Smailhodzic, Hooijsma, Boonstra, & Langley, 2016; Albrechtsen et al., 2017). However, literature on the use of online health information from the perspective of healthcare providers is scanty (Kapur, 2001; Smailhodzic, Hooijsma, Boonstra, & Langley, 2016). Developing and understanding the role of health infomediaries will help government agencies to facilitate processes of designing policies and also allocation of resources to better disseminate quality health information (Van Dijck & Poell, 2016). This calls for studies on the motivational factors underlying health infomediaries.

The inception of digital platforms in the late 90s has undergone tremendous changes. Online web portals (like websites, online forums, and chat rooms), social media, mobile Apps and blogs, serve as platform to share experiences (Zhang, He, & Sang, 2013). These tools have brought new possibilities for co-creation and communication between individuals with minimal time and cost restrictions. Examples include PatientsLikeMe.com, Epilepsy.com, and SeizureTracker.com (Setoyama, Yamazaki, & Namayama, 2011; Solberg, 2014). It seems logical to apply elements of

this revolution to health care. In light of the concepts of social support and weak ties as well as the computer-mediated communication theory, Edejer (2000) pointed out that health support groups are weak-tie networks and their participants share similarity and sympathy to one another. As such, facilitated by features of the computer-mediated media, those who need support can actively communicate with others who share the same concerns.

Numerous studies suggest that online health communities also provide emotional support to patients dealing with difficult health issues (Wang, Zhao, & Street, 2017; Yaraghi, 2015). For instance, in exploring the effects of insightful disclosure on outcomes in peer-led internet breast cancer support groups, Miller-day and Marks (2009) revealed insightful disclosure led to reduced negative mood and improved emotional well-being among users of health support groups. Empirical studies suggest that online health communities could be a valuable source of information (Hesse et al., 2005). Users in these communities exchange information and personal stories and help inform one another in subjects ranging from symptoms, diagnoses, medications, and side effects, to information resources, doctors and clinics, financial helps, and daily life advice (Riso, Tupasela, Vears, Felzmann, Cockbain, Loi, Rakic, 2017; Tonsaker, Bartlett, & Trpkov, 2014). Extant studies have shown consumer's behavior as well as practitioners' perception (Cline & Haynes, 2001; Emont, 2011; Fox et al., 2000; Gonzalez et al., 2016; Riso et al., 2017; Shahab, Brown, Gardner, & Smith, 2014) on online health information. Sillence et al., (2004) pointed the issue of credibility and trust of these online health sites. Also, most of these research was carried out in developed economies (Gücin & Berk, 2015; Rivera, 2013). From the foregoing discussion, there is, therefore, the need to research into the motivation behind the development of these online health information platform from a holistic point of view from the perspective of a developing

country, like Ghana, taking into consideration all the categories of factors that influence developers' intentions from a multi-dimensional perspective.

1.3 Research Purpose

The purpose of this research is to unravel the latent affordances and motivational factors behind health infomediaries in a developing economy through the lens of Technology Affordance and Constraint Theory.

1.4 Research Objectives

The study objectives are:

1. To identify motivational factors behind the development of health infomediaries.
2. To ascertain latent affordances behind health infomediaries.
3. To discover the challenges faced by developers of health infomediaries.

1.5 Research Questions

The following research questions provided direction for the research

1. What are the motivational factors behind the development of health infomediaries?
2. What are the latent affordances of health infomediaries?
3. What are the challenges faced by the developers of health infomediaries?

1.6 Significance of the study

The significance of this study can be viewed along three strands: research, policy and practice.

In relation to research, the study will contribute to academic discourse, thus, the study will add to the already existing studies or stock of knowledge on health infomediaries in a developing economy like Ghana. By this, further studies could be replicated in different settings.

Concerning practice, the findings of this study would help regulators of online health ecosystem in planning effective guidelines for potential developers of health infomediaries. It would also enhance online health information seekers perception and improve their utilization of health infomediaries. Again, it would help the developer of health infomediaries to improve upon their efficiency in contributing to the growth of the operations of health infomediaries in Ghana.

Regarding policy, this research will also contribute to policy by determining whether the content on online health information platforms are always in sync with World Health Organizational policies and guidelines.

1.7 Chapter Outline

This research is categorized into seven (7) different chapters as follows:

Chapter one which is the introduction, highlights the background to the study, the research problem, the research questions which underpin the study and the objectives of the study. The significance of the study is also foregrounded in this chapter. The purpose of this chapter is to give a general background to the study.

Chapter Two provides the review of related literature for the study as well as key concepts that guide the study. It further analyses literature on concepts that are in line with the themes in OHI and health infomediaries.

Chapter Three discusses the research framework and the constructs of the framework relevant to this study. The chapter further justifies why the framework is suitable for this research.

Chapter four presents the methodology that was used in the study. It explains the paradigm, research approach, research method, strategy. It further states the case selected and justifies the selection of case for this study. The chapter concludes by stating the data collection tools and techniques that was be used to analyze the study for the study.

Chapter five discusses the research findings and from the case based on the research purpose and questions. It is premised on the findings from the data collected. It provides detailed findings from the data collected for the study. Also, it captures the profile of the selected case study that is Ghana Health Nest (GHN) and Ghana Health Online (GHOL).

Chapter six brings together all the previous chapters, interprets and explains the findings, critically evaluates the study through the research framework and also seeks to answer the research questions. It further gives richer insights on the findings and provide interpretation of the analyzed findings. The analysis was done using the theoretical lens to explore the respective themes that was applicable in the research. The literature reviewed in the Chapter two was discussed in relation to the findings from the study.

Chapter seven present summary, recommendations, limitations and the future research directions. It therefore provides a detailed summary and conclusion of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

This chapter reviews pertinent literature in the area of online health information, benefits and challenges of online health information and narrows down to health infomediaries. The chapter further reviews literature on health infomediaries to reveal current knowledge gaps for future research.

2.2 Overview of Online Health Information Concepts

The subsections below discuss the details of various concepts that are related to this study which includes some concepts such as Health Infomediaries, Online Health Information Seeker (OHIS) and Ecosystem of Health Infomediaries. This section also narrows down on the phenomenon of interest which includes the consumer and the physicians.

2.2.1 Online Health Information Defined

Health information has been described by Nuffield Council on Bioethics (2010) as information for staying well, preventing and managing disease, and making other decisions related to health and health care. Before the advent of health infomediaries, health information was acquired through consultation with professionals, books, newspapers and magazines. Berland, Elliot, Morales, Algazy, Kravitz, Broder, (2013) pointed out that health infomediaries has become the source of healthful information for consumers and the demand for healthful information is unprecedented. This has given rise to the growing trend in the development of health

infomediaries. Cline and Haynes (2001) defined online health information as an interactive platform where consumers get to meet with individuals with the same health condition. Online health information empowers patients by assisting in assessing their illness, coping with the associated pressures and stress, and facilitating their medical decision-making. Online health information has also been found to be an effective tool used in persuading people to adopt healthy behaviors (Nternet et al., 2006).

2.2.2 Online Health Information Seekers (OHIS)

The search for health information is defined as the search and receipt of healthful tips that help reduce uncertainty about health issues and build a sense of social and personal health (Cotten & Gupta, 2004). Another review also adopts Anker, Marie, and Hugh (2011) definition of health information seeking as active efforts to obtain specific health information in response to a relevant event. Thus, the search for information is seen as an activity oriented towards goals and objectives, rather than being the result of passive exposure to information in one's own environment. With the advent of the internet as a gold mine for those seeking health information, the traditional norm of requesting information from a medical professional in person is not always sustainable (Afful-Dadzie, Nabareseh, Oplatková, & Klímek, 2016). High-speed broadband, smart mobile devices and wireless networks provide consumers with the means to use the internet for a wide range of health information (Fox et al., 2000; Tan & Goonawardene, 2017). This makes it almost impossible and beyond the reach of medical professionals to control the flow of health information on the internet. As a result, studies have shown that most users search for health information online without consulting medical practitioners to confirm the reliability of the information (Ishwarappa & Anuradha, 2015; Shahab, Brown, Gardner, & Smith, 2014; Silver, 2015).

2.2.2.1 Characteristics of Online Health Information Seeking Behavior

Interactions with health infomediaries is not simply limited to engaging in the search for information, but also involves other complexities such as the characteristics of health consumers, the environment, the context, current events and the search process. Considering the practice of online health information search, scholars document nuances of the search process (Shahab et al., 2014). Studies on health information seeking behaviors consider factors such as channels utilized for an information search for example, the content of the information sought, credibility of the information obtained, self-efficacy to participate in the search process, or characteristics of the search process (for example, time spent searching for information, number of sources consulted (Manafo & Wong, 2012; Tustin, 2010). Higgins, Sixsmith, Barry, and Domegan, (2011) classified OHIS into two categories, thus Health Consumers and Health Professionals.

Some other scholars add more specificity to literature by considering how predisposing characteristics of individuals influence varied search practices. For example, how the content of information sought varies according to gender, education or age (Miller & Bell, 2012). Similarly, racial origin has been explored with regard to trust in information channels, while health literacy has been found to influence channel selection (Jacobs, Amuta, & Jeon, 2017).

2.3 Ecosystems of Online Health Information

Ecosystems are advances in information technology used worldwide for the efficient exchange of health information between healthcare professionals and patients. Much work is being done around the world to improve the safety issues associated with OHIS. Benkler (2001) refers to economic

and technological ecosystem as a dynamic structure, which involves a population of interconnected organizations, while Hadzic and Chang (2010) incline towards the design methodology of digital ecosystems for the health domain. Several definitions have emerged over the years with respect to digital ecosystems. For instance, Chang and West (2006) describe a digital ecosystem as an environment of self-organizing agents, open, detached, grouped in domains, driven by demand, in which each species is proactive and responsible for its own benefit or advantage this description implies that each species present in a digital ecosystem is independent and seeks to achieve something. Comparable explanations of digital ecosystems by Hadzic, Dillion, Serbanatti and Vasilateanu (2008) suggests that interactive components within a digital ecosystem should be linked. On the contrary, Briscoe and De Wilde (2007) argue that participants in a digital ecosystem do not necessarily have to be at specific location to connect. Kolb (2013) offers a variable point of view for digital ecosystems as he defines a digital ecosystem as a community of digital devices and their environment functioning as a whole. Digital devices provide information to the other components in the ecosystem. The digital ecosystem simulates the actions portrayed by organisms in a natural ecosystem.

E-health ecosystem is also defined by Wu, Zhang, Chen, and Zhang (2016) as the meticulous, obvious and cautious use of current best evidence in making decisions about the care of individual patients intuitive in its appeal for doing better with scarce resources. Health data is the most important asset that can foster evidence-based patient-centric medicine that is efficient, and offers high quality and value (Neupert, 2009; Jacob, 2013). Online health is a general term that covers various activities related to the use of technology and the internet to deliver and there seem not to be any universal consensus on its scope (Showell & Nohr, 2012). In this research however, online

health information is defined as a platform that allows for interoperability among key players or stakeholders by providing a common platform for interaction and transactions.

In order to ascertain who these key stakeholders are, online health information related literature that has emerged over the past decade and a half was reviewed, and also observed current market trends. According to Busch (2008) the healthcare ecosystem has two levels, thus primary and secondary. At the primary level of the healthcare continuum are stakeholders who use health information to provide patient care directly and indirectly that is datafication. Secondary stakeholders on the other hand, use health information in roles other than direct and indirect patient care activities which can be referred also as commodification. The definition above serves as a useful criterion to distinguish the primary from the secondary level of users of health infomediaries. Several authors (Parente, 2000; Joslyn, 2001; Aggrawal & Travers, 2001; Wen & Tan, 2003; Konrad & Peter, 2007; Van Limburg et al, 2011; Bahga & Madisetti, 2013) identified patients, suppliers and infomediaries as key (players) in online health. However, many studies did not include regulators in the online health ecosystem until Broderick (2003) and later Walker (2005) recognized the role of Ministry of Health as a regulator of online health information. The digital flows on online health information platforms are governed by a number of regulations and standards specified by these regulators.

Table 2.1: Key Online Health Stakeholders

STAKEHOLDERS	ROLE
Health Consumers	Recipients of health services (Busch, 2008).
Health Providers	Any clinical setting and professional staff that designs, implements, and/or executes any healthcare initiative which may be part of a wellness or illness program (Busch, 2008).
Health Professionals	A body that maintain health in humans through the application of the principles and procedures of evidence-based medicine and caring (W.H.O)
Infomediaries	Organizations that act as mediators or brokers to facilitate information exchange among its network participants, gather pertinent information from them, and syndicate, aggregate and distribute this information to foster patient-centric health care (Busch, 2008; Morales-Arroyo & Sharma, 2009; Mettler & Eurich, 2012).
Regulators	Public and private organizations that develop capabilities for standards-based, secure and confidential exchange of health information to improve the coordination of care among stakeholders (Blumenthal, 2009).

Source: Author's Construction

2.3.1 Health Consumers

In the context of studies on online health information seeking, health consumers can be generally be classified as patients, friends, relatives, and citizens, and health seekers have been defined as internet users who search online for information on health topics, whether they are acting as consumers, caregivers or ePatients (Juan, Xiaorong, & Wenlong, 2016).

Online health information users search are found to be related to their individual characteristics and situational factors (Afful-Dadzie et al., 2016). Individual characteristics include both socioeconomic and psychological characteristics. For example, a high-income, married and somewhat youthful female is more likely to be engaged in the search of health information. An individual with a higher health value and an internal health locus of control tends to search more for health information (Gray, Klein, Noyce, Sesselberg,& Cantrill, 2005). Gonzalez et al., (2016) found personal health orientation could predict a person's preference toward health information channels. Health information is increasingly being disseminated over the internet (Shahab et al., 2014); hence, there is a need to focus on those participate actively on health infomediaries to improve health information. Online health information search is the most popular use of the internet in recent times (Jacobs et al., 2017). The use of online and mobile interventions shows promising results as a way to implement large-scale behavioral changes (Fox et al., 2000). As a result, tracking online health information-seeking behavior is particularly important because online health information-seeking behavior is associated with risk behaviors in the general population (Cline & Haynes, 2001; Gonzalez et al., 2016).

The search of online health information search is associated with a wide variety of factors this varies depending on type of information sought, reasons for searching and experience levels (Cline & Haynes, 2001). Current research shows that females are more likely to search for health information than males (Tan & Goonawardene, 2017) and online health consumers tend to be more educated, earn more and have high-speed internet access at home and at work (Li, Wang, Lin, & Hajli, 2018). Health consumers use information obtained online in different ways. Online health information survey by WHO indicates that 29% had used information from the internet to decide

whether they needed medical attention, one in four used the internet in conjunction with their doctor's appointment (Gauld et al., 2012). In a survey conducted by Manafo and Wong (2012) and Tan and Goonawardene (2017) 59% of newly diagnosed patients stated that the information they had accessed prompted them seek a second opinion.

2.3.2 Health Professionals

Studies have shown that the use of the internet by health professionals to obtain health and medical information has increased (Higgins, Sixsmith, Barry, & Domegan, 2011). In an article, a 2010 edition of the New England Journal of Medicine, the authors state that nothing has changed clinical practice than a recent innovation: the internet (Smailhodzic, Hoojasma, Boonstra, &Langley, 2016). However, the amount of information available means that healthcare professionals are increasingly finding that they have more information available than they can handle with confidence in their busy time schedules (Zhang et al., 2013) and the hardest task now is to actually locate the information required from the flood of information received (Li, Wang, Lin, & Hajli, 2018). The literature also highlights the difficulty of identifying and filtering the most useful, accurate and credible sources while searching for health information online (Health & National, 2005; Hesse et al., 2005; Tustin, 2010). As with research on health consumers, the dangers involved in drawing definitive conclusions from the reviewed literature in relation to health professionals on the web is that there is little consistency between the subject matter of the research undertaken and the methodologies and terminologies used while there are a very limited number of comparative studies assessing health professionals' online health information-seeking behavior, small studies within professions such as nurses and general practitioners have been undertaken (Deloitte, 2015; Higgins et al., 2011; Juan et al., 2016). There are a number of general inferences

that can be highlighted particularly in relation to health professionals' motivations for using the internet, how the search is undertaken, barriers to use, evaluation of source credibility and utilization of information sourced (Albrechtsen, Poulsen, Svensson, Jensen, Holst, & Torekov, 2017).

In a systematic review by Tan and Goonawardene (2017) of 38 studies from 1994 to 2004 on why medical professionals use the internet, it was indicated that consistently, the use of the internet by medical professionals are more than their national average and their activities focus on the use of email, retrieving information from online journals, attending courses and conferences, receiving professional updates and performing professional and administrative functions. In another review on internet-based information-seeking behavior amongst doctors and nurses based on 23 studies between 1995 and 2009, Merolli, Gray, and Martin-Sanchez (2013) found that doctors need online information for clinical care, continuing professional development and patient information.

2.3.3 Health Providers

The internet has brought a new dimension to information access online. The context in which health consumers assess healthful information online has advanced in telemedicine, and changes in media health coverage (Health & National, 2005). As a result, data entry and review systems are becoming ubiquitous in hospital settings and health care technicians are developing applications in medical informatics to improve the quality of medical care.

2.3.4 Infomediaries

Organizations or institutions that act as mediators or intermediaries to facilitate the exchange of information between participants in their network, gather relevant information from them, and syndicate, aggregate and distribute this information to foster patient centred medical care (Busch, 2008; Morales-Arroyo & Sharma, 2009; Mettler & Eurich, 2012). In general, infomediaries serve as knowledge translators. While this may be especially true for those with formal responsibilities as librarians and educators, various people may serve as infomediaries for information seekers, no matter what their formal role. Ramírez, Parthasarathy, and Gordon (2013) in citing Stewart and Hyysal (2008) identify three core roles for infomediaries: facilitation, configuration, and brokering. They define each in the following way:

Facilitating can be described as providing opportunities to others, by educating, gathering and distributing resources, influencing regulations and setting local rules. Facilitation involves creating spaces of various types: social (communities, networks), knowledge (skills and know-how resources), cultural (positive images), physical (a place or equipment), economic (providing funds), and regulatory (creating rules to guide activities and reduce uncertainty).

Configuring: The creation of the space that facilitates appropriation by others and influencing the perceptions and objectives of sponsors and users involves active processes of configuration.' This includes configuring technology, often in a minor way; creating and configuring content; setting rules and regulations on use and usage, prioritizing uses, the goals and form of projects, and the goals and expectations of other members of a network.

The third activity of intermediaries in social learning processes is brokering.' For example, intermediaries act to raise support for the appropriation process from sponsors and suppliers. They set themselves up to represent appropriating individuals and institutions, and negotiate on their behalf.

While general-purpose infomediaries like answers.com and ask.com serve a wide range of purposes, some infomediaries exist to serve more specific purposes such as mechanics, travel, and food. Health infomediaries are among the specific purpose infomediaries' and serve the health issues by providing a conduit of connection between patients and providers. When compared to other types of infomediaries, health infomediaries are unique in several ways: The nature of information shared, the importance of information quality, motivational factors driving the information sharing.

2.3.5 Regulators

Regulators refers to public and private organizations that develop rules to guide online interactions taking into considerations , confidentiality, quality and standards-based health information to improve the coordination of care among online health stakeholders (Blumenthal, 2009). As illustrated in figure 2.1, the online health ecosystem consists of several stakeholders including consumer, professionals, providers, infomediaries, and regulators. Each of these stakeholders contributes to quality health information on these health infomediaries.

Figure 2.1 Online Health Ecosystem

Source: Author's Construction

2.4 Health Infomediaries

According to Van Dijck and Poell (2016) platform is a system that can be programmed and customized by external developers. This can be adapted by innumerable needs and niches that the original developers could not contemplate or much had less time to adapt. The ideal online health platform offers safe social communications for the patient and many other useful resources. Health information comes in varied forms and it has been classified by Nuffield Council on Bioethics (2010) as sites providing general health information; disease-specific sites; social communities; scientific databases; and web tools. Online health information sites are developed for varied reasons which includes commercial purposes, for non-profit reasons, such as public policies. An example of non – profit health platform aims to improve the health of the population or increase

the efficiency of the public health service or altruistic, such as a desire to help and learn from those with similar health problems (Nuffield Council on Bioethics, 2010).

Power mechanisms that guides digital platforms includes datafication and commodification. Datafication employs collective tools, technologies and processes to 'data mine' user data with a view to serving them better through content tailoring. Thus, buzzword describes an organizational tendency to define the key to core business operations through a global reliance on data and its related infrastructure. Content tailoring is the fundamental component of datafication. Every interaction with health infomediaries is been translated into data. Examples of these data that can often be transformed into another value include vital signs, objective measurements, subjective experiences, medicine intake, personal information, test results, etc (Yaraghi, 2015). Commodification on the other hand, refers to the way in which user data is transformed into monetary value. In most cases, this means some platforms sell health information products to consumers and sometimes in combination with advertisements. Other means of commodification identified are through the use of free health focused mobile apps exchange for their personal data, which may be shared with paying industrial partners or co-patients. Some of these online platforms have business models of which they turn personal data strategically into valuable goods (Aggarwal & Travers, 2001).

2.4.1 Benefits of Health Infomediaries

Health Infomediaries offer a wealth of information for its users. The opportunity to belong to an online health information community has provided several users with emotional support and motivation (Solberg, 2014). Furthermore, to provide Information and support, online health communities can be the cradle of beneficial social movements, such as participant-led research, in which participants are the leading force in the initiation the projects (Riso, Tupasela, Vears, Felzmann, Cockbain, Loi, Rakic 2017). For example, an online support group called spontaneous coronary artery disease (SCAD) convinced a researcher at the Mayo Clinic to initiate research that led to the creation of a SCAD registry (Solberg, 2014). This became an important step in conducting more research on this rare disease. Without an online forum, this group might never have been able to connect with each other and galvanize support for such a project.

Health Infomediaries offers users with several helpful features for social support and as well enables effortless formation of groups (Wang, Zhao, & Street, 2017). Although the use of online communities is not new, recent developments include increasing uptake of high-speed internet access, the ready availability of Web 2.0 applications, mobile access, and the e-patient movement (Wicks, Keininger, Massagli, Brownstein, & Isojarvi 2012). Sites such as PatientsLikeMe.com, Epilepsy.com, and SeizureTracker.com provide patients with a number of benefits that have been recognized as important in permitting patients to live well and manage their health condition (Wicks et al., 2012; Zhang, & Sang, 2013). First, online communities improve the knowledge level of patients via high-quality content (Willard, Cremers, Man, Rossum, Spreeuwenberg, & De Witte, 2018). Second, the social support can improve patients' self-management through a number of mechanisms such as improved self-efficacy, positive social norms, and reduction of stigma

(Wang et al., 2017). Third, online health community helps patients track their condition and also creates the opportunity to record additional valid details to share with health care professionals (Setoyama et al., 2011).

2.4.2 Challenges in the Usage of Health Infomediaries

Health infomediaries is also plagued with its own challenges. Regulation of health information online is a difficult task, since most of these infomediaries are properly regulated, quality control poses a challenge. Additionally, consumers' needs vary with regards to health information that is mainly sought from these infomediaries. Lack of regulation of these infomediaries puts the health consumers at greater risk which can be detrimental to their health (Anker et al., 2011; Higgins et al., 2011). Some health infomediaries promotes medicines or equipment is abstruse unscientifically proven (McMullan, 2006). Such situations leave most health consumers in a vulnerable position persuading them to rely on any health information they chance on that is likely to help them manage their condition (Liebert, Morahan-martin, & Ph, 2004). Due to limited knowledge in health, some consumers may assess or might misinterpret information gathered online (Anker et al., 2011).

The key challenges discussed above pose threats to health consumers which can lead to insecurity and potentially exposed them to inappropriate medical practices. In a traditional sense, a medical professional play the role as the custodian and provider of health information under ideal circumstances, and also to ensure that each patient receives valid medical information that is tailored to their level of understanding (Higgins et al., 2011).

2.5 Review of Literature on Online Health Information

Reviews conducted during research enables the researcher to address unattended issues, fill in gaps in research, discover a strong basis for a research topic and also provide justification for the choice of a research approach. Review of literature enhances the identification of research problems that need to be addressed or studied on to provide solutions and as well provides a broad view on existing knowledge. Review of related literature provides researchers with an in-depth knowledge of the subject being studied and it also helps to unravel research gaps and a theoretical stance of the topic under study. Similar to the work of Boateng, Hinson, Heeks, and Molla (2008) this study classified the review into three; purpose, research method, and underpinning theory. The classification scheme adopted in this review process is discussed in the literature classification phase. The review consists of selected articles in the area of health infomediaries.

2.5.1 Conceptual Approaches to Health Infomediaries

This section focuses on the dominant conceptual approaches used in online health information platform literature in order to suggest conceptual gaps for future research. Research on health infomediaries as per the review tends to be dominated not by any particular theory. Few of the theories used are Social Support Theory (Net Valence Model), Grounded theory, Technology Acceptance Model (TAM), Information foraging theory. Table 2.2 summarises the theories with their focus area of research and research gap.

Table 2.2: Review of Related Literature

Authors	Research Title	Purpose/Focus	Underpinning Theory or Framework	Research Method and Country
Li, Wang, Lin, & Hajli (2018)	Seeking and sharing health information on social media: A net valence model and cross-cultural comparison	Factors affecting users' intention to seek and share health information on social media	Social Support Theory (Net Valence Model)	Quantitative USA
Manafo & Wong (2012)	Exploring Older Adults' Health Information Seeking Behaviors	To explore older adults' health seeking behavior	Grounded theory	Qualitative Canada
Miller & Bell (2012)	Online Health Information Seeking: The Influence of Age, Information Trustworthiness, and Search Challenges	to examine age differences in the role of trust and ease of search in predicting whether or not individuals use (adopters) or do not use (non adopters) the Internet to search for health information	Technology Acceptance Model	Quantitative USA
Xiao et al. (2014)	Factors influencing online health information search: An empirical analysis of a national cancer-related survey	examines the impacts of IT enablers and health motivators on peoples' online health information search behavior	Information foraging theory Conceptual framework	Quantitative USA

Source: Authors Construction. See Appendix B for more details

The following subsection discusses a few of the theories used in the literature. This is to guide the choice of an appropriate research framework for this research.

2.5.1.1 Grounded Theory

Grounded theory is an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or data (Charmaz, n.d.). Ralph, Birks & Chapman (2015) made the assertion that, preconceived ideas cannot, of course, be completely abandoned however, it encourages the researcher to focus on a detailed description of the characteristics of the data collected before attempting to produce.

In information systems (IS) research, particularly in online health information, grounded theory is used for studying people's understandings of the world and how these are related to their social context (Gatero, 2011; Goodall, Newman, & Ward, 2014).

2.5.1.2 Technology Acceptance Model

TAM was developed to predict individual adoption and use of new ITs. It posits that individuals' behavioral intention to use an IT is determined by two beliefs: perceived usefulness, defined as the extent to which a person believes that using an IT will enhance his or her job performance and perceived ease of use, defined as the degree to which a person believes that using an IT will be free of effort. It further theorizes that the effect of external variables (e.g., design characteristics) on behavioral intention will be mediated by perceived usefulness and perceived ease of use. Over the last two decades, there has been substantial empirical support in favor of TAM (Gücin & Berk, 2015; Miller & Bell, 2012; Morris, Hall, Davis, Davis, & Walton, 2003). TAM consistently explains about 40% of the variance in individuals' intention to use an IT and actual usage (Bala & Venkatesh, 2008).

2.6 Research Gaps and Future Research Directions

From the reviewed literature, it is evident that there is a need to research on health infomediaries as it was apparent that some actors of the online health ecosystem like regulators and also affordances of these platforms have still not be covered extensively. Also, there is a wide gap in literature that revealed that to a large extent majority of these research were conducted from a single stakeholder perspective such as consumer (Barry & Domegan, 2011; Cline & Haynes, 2001; Higgins et al., 2011; Juan et al., 2016; McMullan, 2006; Silver, 2015; Zhang, Sun, & Kim, 2017) and the practitioner (Anagnostelis, 2002; Huang, Behara, & Goo, 2014; Smailhodzic et al., 2016). And the few which tried to combine stakeholders also did not include the major stakeholders of demand and supply side of health infomediaries. For instance, (Wewer Albrechtsen et al., 2017) analyzed patients and doctors interaction with online health information platform. Focusing more on the demand of online health information (OHI). By far no studies have been conducted on both the demand and supply side of health infomediaries focusing particularly on the motivational factors and its latent affordances. There is, therefore, the need for studies to be conducted to reveal the latent affordances and motivational factors behind the development of health infomediaries.

Again, only a handful of the papers reviewed, used theory (Caiata-zufferey et al., 2010; Manafo & Wong, 2012; Miller & Bell, 2012; Wang et al., 2017) while all the others used conceptual frameworks (Anker et al., 2011; Hesse et al., 2005; Juan et al., 2016; Leung & Ph, 2008) for their studies. Amongst the reviewed literature, none of them used technology affordances and constraints theory to study online health information. This makes this study opportune and very relevant to fill the theoretical gap of online health information through the lens of Technology Affordances and Constraints Theory (TACT) to reveal the motivational factors behind the development of online health platforms.

2.7 Chapter Summary

This literature review was intended as a means to an end as posited by Yin (2009). The end being an understanding of health infomediaries. This chapter discussed key concepts of the study. The review literature provided direction in choosing the theoretical frame of the study which is discussed extensively in the next chapter.

CHAPTER THREE

THEORETICAL FOUNDATION

3.1 Chapter Overview

This chapter discusses the theory adopted for the study after reviewing pertinent literature relating to health infomediaries in the previous chapter. The theoretical foundation was adopted because it is deemed suitable for studying the use of technology and the motivational factors behind the development of an information technology platform would be better explained by the technology affordance and constraints theory.

3.2 Empirical Grounding of Technology Affordances and Constraints Theory (TACT)

Theories provide means by which concepts or variables are studied concerning a phenomenon to investigate the solution for a research problem (Boateng, 2018). Theories also enable researchers with respect to the methods to use and the questions to ask in terms of data collection in a quest to answer the main research questions. Hence, TACT was chosen as the theoretical lens to provide direction and guide to data collection and analysis of health infomediaries.

3.3 Overview of TACT

Affordances, as it was first coined by Gibson (1979), related affordance with an action possibility available in the environment. His application of affordances was in relation to the users and the environment that they operate in. Moving forward, Chin, Diehl and Norman (1988) related the environment to human-computer interaction and the interaction between an object and a designer. Then, Hutchby (2001) applied the original concept of affordance moving from the environment to computer object by designers to technologies, viewed as Information Technology (IT) artefacts.

In this digital age, researchers in the Information System (IS) discipline follow the Hutchby (2003) approach and relate it to the use of IT artefacts. Moreover, some studies where affordance has been utilized, it has been argued that there are constraints that also hinder the users from using the technology (Peters & Koch, 2017; Verhulst & Rutkowski, 2017; Majchrzak & Markus, 2013; Leonardi, 2011). Hence, TACT has become a framework that is used progressively to study how people and organizations utilize IS and how the use of IS influences individuals, organizations, and their execution level (Majchrzak & Markus 2013).

The TACT viewpoint has now attained an eminence application in the IS discipline as an effective analytical lens to studying the technology appropriation process and the multifaced relationships between the technology and the social; including users of the system (Leonardi & Barley, 2008). Moreover, researchers in the IS discipline have addressed affordances and constraints as relational concepts which are studied concurrently in contemporary literature (Verhulst & Rutkowski, 2017; Leonardi, 2011; Faraj & Bijan 2012); hence several definitions have emerged. Technology affordances is defined by Faraj and Bijan (2012) as action possibilities and opportunities that emerge from actors engaging with a focal technology. On the other hand, Majchrzak and Markus (2012) also defined technology constraints as the ways in which an individual or organization can be held back from accomplishing a particular goal when using a technology or system. This establishes that there are enablers and constraints that users encounter towards the use of IS and TACT was used as a theoretical lens to gain more insights in this phenomenon.

As informed by TACT, while technological features may be designed to support collaboration, the entanglement between the users and technology may not enact in terms of how flexible the system is and the competence level of the users. However, to stress on Majchrzak and Markus (2012)

viewpoint about TACT, the essential premise is that, to appreciate the application and consequences of IS, one must consider the dynamic interactions between people, organizations and the technologies they use. Considering this, TACT helps researchers to understand the enablers, constraints and consequences when users interact with online health platforms. Furthermore, it is apparent that people, organization and technology are essential tools that TACT considers gaining a unified understanding of IT artefact that are in use. Hence, TACT stresses on the collaboration with respect to the interaction that exist between the technology and the human rather than technological features or human attributes separately to afford or hinder information system use. In this regard, Verhulst and Rutkowski (2017) alluded that affordances and constraints come to play when users interact with technology.

The discussion above makes it evident in literature that TACT is based on the concept of users who use the technology and the technology itself as they emerge from the entanglement between users and the technologies in use. In addition, Leonardi, and Barley (2010) disputed that neither the human or the technology is favored above the other, hence when humans experience constraints from technology, they may change it, whereas a feeling of affordance triggers human to change their routines to comprehend other features of the technology.

3.4 Concepts of TACT

As espoused by Majchrzak and Markus (2013), TACT includes the concepts of the technology in use, the affordances and constraints. The technology construct of the theory is the system that is in use by the organization and the users. The technology presents the affordances and constraints to the users and the organization and it is dependent on the type of technology and the skill level of the users.

The affordances perspective was first coined by Gibson (1979) to explain the human interactions with the environment. Later, Chin et al. (1988) popularized it in design and human-computer interaction research and Hutchby (2001) related affordance to technology because the world was evolving. Chin et al. (1988) defined affordances as the design aspect of an object which humans interacts with and how it should be applied. Notwithstanding, consequent researchers argued that affordances can develop through direct communication with technologies, which frequently prompts procedures of experimentation and adaptation that shape the actions people take with technologies (Gaver, 1991). Technology affordances are action possibilities and opportunities that emerge from actors engaging with a focal technology (Faraj & Azad, 2012). They are preconditions for an activity, but do not imply that the specific activity will occur (Greeno, 1994). A technology affordance also arises from the relation between an actor and technology in a setting and offers strong clues for the use of the technology. Some authors also argue that technology affordances can be subjective and objective in nature. Technology affordances act as enablers for action, however, some authors assert that affordances must be triggered to ascertain (Volkoff & Strong 2013) for a goal-oriented actor to achieve an outcome. Moving back to Gibson's affordances, the idea of actor-environment mutuality that was introduced as the actor and the artefact are inseparable pair is still in use. This is because the technology and users are now inseparable pair, hence, users are a necessity to perceive the technology.

On the other hand, the other concepts of TACT are the constraints that users also encounter with the use of a technology. A technology constraint refers to how the technology can hinder individuals or organizations from accomplishing their aims and objectives (Koch & Peters, 2017). Moreover, Verhulst and Rutkowski (2017) defined technology constraints as how users or organization can be hindered from performing a desired task when using a technology or system.

Technology is said to make life easier and enable work to be faster, however, there are some pitfalls with the technology application. These pitfalls can be the technology itself, the users or the environment in which the technology is been employed. When the technology in use is not user friendly or it is difficult to work with, it makes the learning procedure on the part of the users challenging. Some researchers also argue that affordances can be constraints, enablers, or both (Loenardi, 2011; Faraj & Bijan, 2012) and they are relational, that is, perceived as potential interactions between people and technology, rather than as properties of either people or technology (Majchrzak & Markus, 2012).

Moreover, the level of affordances and constraints of technology has impact on the outcomes which is seen as the technology's impact on productivity (Koch & Peters, 2017). Since technology can either enable or constrain, it is therefore essential to explore the technology's impact of output since increased productivity is not automatic. Zamutto *et al.* (2007) asserted that since affordances and constraints are relational and existing between people and technological artefacts, it can be applied in different ways and have diverse effects on the organizational output thereby having great impact on the outcomes.

3.5 Application of TACT in IS research

TACT has been used by a few researchers in the IS discipline (Majchrzak & Markus, 2012; Verhulst & Rutkowski, 2017; Koch & Peters, 2017). These studies used TACT as theoretical lens to study the entanglement between users and technology and also to understand how technology afford or constrain users. Verhulst and Rutkowski (2017) employed TACT to evaluate how technology can constrain and afford human mindfulness in the police emergency response unit. It was revealed that human mindfulness is important to achieve a successful collaboration between

the human and the technology. Their findings reveal that when technology is not used to its full potential, it hinders collaboration between the users and the technology. Additionally, the results show that though the technology can do the work, users should still be mindful and do not over rely on the technology. Moreover, Koch and Peters (2017) used the TACT to enable them to investigate the enablers and constraints faced by functional departments implementing shadow analytics projects. In their research, they found out that both the vendor and the clients play a vital role in the success of the system. They added that, sometimes, the same factors can enable or constrain the various departments and stakeholders. Therefore, it is important to understand how to bridge the gap between the users and the technology to ensure system success. TACT should be applied in more contemporary research to explore the affordances and constraints of technology implementation and use though it has been studied in some IS research.

3.6 Justification for the Choice of TACT

The Technology Affordances and Constraints Theory is adopted for this study because it provides understanding on the perceived possibilities, opportunities and constraints of a technology to an individual or an organization. Volkoff and Strong (2014) mentioned that technology affordances and constraints theory is useful to study the development of IT platforms. In this regard, the technology affordance theory has been adopted in a number of researches and has aided in empirically examining the perceived usefulness of a technology. This informed the choice of the technology affordance and constraints for this study.

TACT emerged as the most appropriate theory for the study because the focus is on a technology artefact in use by an organization. In the case of this study, Online Health Information developers and the latent motivations, possibilities, opportunities as well as constraints that arise when Online Health Information Infomediaries set up Online Health Information (OHI) platforms are studied. The TACT theory is to guide

the researcher to understand whether there are other Latent affordances (possibilities and opportunities) inspiring the growing establishment of OHI platforms in Ghana.

3.7 Limitations of the Theory

Owing to a few empirical studies, TACT is seen as a relative new framework in IS research. Arguably, TACT scholars have not made much progress toward consensus about the existence, nature, and naming of technology affordances and constraints across contexts or technologies. In part, this is a function of the granularity of analysis. If technology analysis is fine-grained and each setting is treated as unique, there are virtually infinite combinations of technology and human or organizational behavior. Conversely, if the scope is broad enough, that is, if all instances of a class of technologies or even all information technologies are considered at once, the general affordances and constraints may be so few in number and so abstract that they are not useful to other scholars. For instance, for the class of decision support systems, the accepted affordances and constraints (guidance and restrictiveness) are quite general and can be interpreted as synonyms for affordance and constraint. Similarly, simplification has been proposed as an essential affordance or constraint of information technology as a whole.

3.8 Chapter Summary

In summary, this chapter discusses the theoretical foundation of the study which is technology affordance and constraints theory. It provides an overview of the theory from its inception and a detailed discussion in relation to the objectives of the study. The chapter justifies the adoption of the theory as the appropriate theoretical foundation for the study with reference to researches directly related to the subject area. The next chapter explains the methodological approach used for the study.

CHAPTER FOUR

METHODOLOGY

4.1 Chapter Overview

Understanding Technology Affordances and Constraints theory and revealing the latent affordances of health infomediaries was the focus of the previous chapter. With this background, this chapter discusses on the research methodological position of investigating the motivational factors of health infomediaries.

4.2 Research Paradigm

Research is founded basically on philosophical assumptions, which are related to the researcher's view or perception (Krauss & Putra, 2005). Paradigm can be defined as a set of beliefs, values and techniques which is shared by members of a scientific community, and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them (Kuhn, 1970). Neuman (2014) also defined paradigms as integrated set of assumptions, beliefs, models of doing good and techniques for gathering and analyzing data.

Paradigms are aimed at structuring research within specific and acceptable concepts. Thus, in order for researchers to understand the phenomenon they are investigating, they need an awareness of their philosophical commitment in their research strategy (Johnson & Larry, 2003). According to Myers (1997) paradigms do not only give a fixed definition of what is a valid research, but rather they provide for the study the most appropriate and applicable methods to use. Paradigms are differentiated from the set of taxonomies that come together to formulate it (Creswell, Klassen, Clark, & Smith, 2011). Kinash (2006) established three fundamental elements that characterize the distinctions between paradigms as Ontology, Epistemology and Methodology. Ontological assumptions refer to the nature of and form of reality and determine what constitute legitimate

researchable questions (Boeije, 2009). Epistemological perspective looks at the nature of knowledge and how it can be applied to determine what can be considered as knowledge (De Langen, 2003). The procedures involved in exploring a phenomenon is normally influenced by the methodological stance of paradigms which includes quantitative, qualitative or mixed methods (Johnson & Larry, 2003).

4.2.1 The Positivist Paradigm

The positivist paradigm presents the researcher as an independent entity of the study. The research employs direct observation, and through investigation of a phenomenon facts established (Krauss & Putra, 2005). With the positivist paradigm, a phenomenon is being explored by a researcher without controlling it. According to Kinash (2006), positivists do not only assume the existence of reality or the real world that exists beyond the cognition of human beings, they also assume that acquiring the objective knowledge of reality is possible. The positivist paradigm takes on an objective reality that is unique and concrete and independent of what is being researched. Distance or objective separateness between the researcher and the object of study is one of the main features of the positivist paradigm (Joubish, Khurram, Ahmed, Fatima, & Haider, 2011)

The positivist research worldview holds that target reality can be watched observationally and clarified with intelligent examination. This worldview keeps up that the analyst and the investigation must be viewed as independent substances. Accordingly, it is expected that the positivist scientist is neither influenced by the subject under examination nor does he influence the subject under investigation since the specialist is considered as being free of the subject of research (Benjamin, Bjork, & Schwartz, 1998). Subsequently, it utilizes coordinate perception in setting up actualities (Krauss & Putra, 2005)

4.2.2 The Interpretive Paradigm

To interpretative researchers, the existence of reality is paramount underpinning that the reality of this paradigm is subjective (Weber, 2004). Thus, interpretivism do away with objectivity. Researchers in this field believes that surrounding events influences individuals' behaviour and hence try to understand how others interpret, see and understand events (Kaplan and Duchon, 1988). According to Myers (1997), interpretism presupposes that it is through social constructions such as conscious language and meanings that are shared to allow access to reality. Information system researchers who adopt the interpretative paradigm in their studies tend to focus on understanding the context and how information systems are impacted (Walsham, 2006).

4.2.3 The Critical Realist Paradigm

This paradigm affords researchers to develop in depth explanations and descriptions for the outcome of specific social phenomena by taking into account factors such as the breadth of information technology, social constituents, and the organization which may have played a causal role in their occurrence (Wynn & Williams, 2012).

The ontological perspective of the critical realist paradigm perceives the existence of two worlds; transitive and intransitive. Transitive is what we observe and learn with our mind, thus the perceptions of reality and intransitive embodies the reality which is independent of what the mind thinks (Boateng, 2014). The epistemological perspective of the critical realist paradigm posits that knowledge is grounded in social and historical practices, thus a whole phenomenon cannot be studied in isolation of its society and context within which it operates, because of the possibilities of influences of historical, economic, social and political conditions on the phenomenon (Orlikowski & Baroudi, 2001). The research employs methodologies that offers the researcher the

opportunity to investigate complex organizational phenomena in a holistic manner by providing more detailed causal explanations of the phenomena (Wynn & Williams, 2012).

4.2.4 Choice of Critical Realist Paradigm

Critical realism is useful when the researcher seeks to analyze and comprehend the subjective realities that exist (Boateng, 2016). Critical realist research assumes that social reality is constituted and constructed by people and that despite the deliberate effort to change their social and economic circumstances, they are normally limited by social, cultural and political powers. Since the study is aimed at investigating the motivational factors of online health information platform, the critical realist paradigm was deemed appropriate for the study to explain the differences between reality and people's perceptions of reality (Bisman, 2002). The purpose of the critical realist is not to predict but to explain social phenomena through examining patterns of association and possible explanation and also aim at seeking insight into key participants rather than drawing on generalization based on statistical significance

4.3 Research Design and Methods

Johnson and Onwuegbuzie (2004) describe research design as the steps for collecting, unionizing and integrating a research data to achieve an outcome, thus, a research finding. Thus, a research design is the plan detailing how data is to be collected and analysed, as well as the where and when to collect data and analyse. There are two main categories of research methods extensively used by social science researchers namely, qualitative and quantitative methods (Johnson & Onwuegbuzie, 2004), however, Creswell (2009) added a third dimension to research design which is the mixed methods. The quantitative approach normal adopts the positivist paradigm while the

qualitative method normally goes with the interpretivism paradigm, and the mixed-method with the critical paradigm (Mingers, 2003). This study adopted the qualitative research design.

4.3.1 Qualitative Method

According to Leedy and Ormrod (2010), qualitative research is typically used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants point of view. Similarly, Holloway and Wheeler (2002, p.30) described qualitative research as a form of social enquiry that focuses on the way people interpret and make sense of their experience and the world in which they live. Thus, the qualitative research method was developed by the social science researchers to aid in the study of social and cultural phenomenon. Researchers therefore employ the qualitative approach to explore the perspectives and diverse experiences as well as the behaviour of people and further emphasise the understanding of people's experience and behaviour. According to Creswell (2007) there are five major approaches of qualitative research namely, generic qualitative study, ethnography, phenomenology, grounded theory and case study. The main data sources of qualitative research include interviews, questionnaires, documentation, observation, and the perception of the researcher (Myers, 1997). The choice of a particular type of qualitative research is influenced by the purpose of the research. The type of qualitative research adopted by this study is case study. The justification of this choice is provided subsequent sections in this chapter.

4.3.2 Quantitative Method

Jonker and Pennink (2010) refer to quantitative research as quantities implying how far something either does or does not occur in terms of amount, number, frequency et cetera. Creswell (2009)

further amplifies this to say that the quantitative approach is the means of testing objective theories by examining the relationships that exist among variables. Variables are measured using statistical tools and procedures. Thus, quantitative research is used to explore relationships among measurable variables to provide explanations and to predict and control phenomenon. Since this study does not seek to explore the relationship among variables, the quantitative method was not appropriate or a good fit for the study.

4.3.3 Mixed Methods Research

Mixed method research is used to investigate the world that preferably involves more than one methodological tradition and thus more than one way of knowing, along with more than one kind of technique for gathering, analysing and presenting human phenomena; all for the purpose of better understanding (Greene, 2006). What pre-empts the choice of mixed methods is that combining the two approaches in one study would lead to providing a better insight into the research problem than using either qualitative only or quantitative only. The purpose and objectives of this research are best addressed by the qualitative research and hence, mixed methods research was not considered.

4.3.4 Justification for the choice of Qualitative Method

As argued by Burns and Grove (2003) the qualitative approach offers a systematic subjective approach used to describe life experiences and situations to give them meaning. Thus, the central focus of qualitative research is the experiences and perspectives of the participants. In the process of getting to know the participant's perspective, the researcher gets to learn and know more by participating and or being immersed in the research which contributes to data collection and

analysis' uniqueness (Streubert & Carpenter, 1999). Although there cannot be complete objectivity (Holloway & Wheeler, 2002), the knower and the known cannot be treated separately in research because the only source of reality is the subjective knower (Guba, 1990). Again, qualitative research offers understanding of issues on a particular phenomenon.

Newman and Benz (1998) assert that the research approach that is appropriate for a particular study is the one that best helps answer a specific research question or problem. Therefore, the study chose the qualitative approach as being appropriate for the study. A qualitative research approach was appropriate to explain the various factors that motivate the development of Online Health Information Platforms.

4.4. Case Study as a Qualitative Research Method

Case studies provide rich description and analysis of a given phenomenon. Given the focus of this research, thus, exploring the latent motivational factors behind the development of Online Health Information platforms, the case study research was chosen. The case study approach has been defined by Yin (1994) as an empirical enquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident (p. 13). Thus, the central aim of a case study is to provide rich insights about a phenomenon and its setting (Cavaye, 1996). Stoecker (1991) further clarified that case studies offer researchers the opportunity to explore different outcomes of general processes as suggested by theories depending on different contexts. Again, Easton (2010) asserts that case studies are appropriate to accompany critical realism.

4.4.1 Case Study Design

Case study approach has been widely used in information systems research (Boateng, 2011; Cavaye, 1996; Benbasat, Goldstein, & Mead, 1987). Myers (1997) emphasised the significance of the use of case study with the assertion that case study research approach is well-suited to information system's research since the object of our discipline is the study of information systems in organizations. For instance, in researching the impact of mobile phones on micro-trading activities of Ghanaian women traders, Boateng (2011) used case study approach. Coming from the backdrop of a single case study as the chosen case design, this study further adopted the descriptive case study approach for theory testing. For such a study, there should be a selected theory which informs the design of the phenomenon to guide data collection (Yin, 2003; De Vaus, 2001).

4.4.2 Case Selection: Health Infomediaries

An academic inquiry on a group of people or persons from an organisation require that a site based on the characteristics of the organisation is selected (Benbasat *et al.*, 1987). In ensuring this requirement only health infomediaries with similar characteristics were selected for this study. As argued by De Vaus (2001), the external validity of case studies is enhanced by the strategic selection of cases rather than their statistical selection. An online search was conducted on health infomediaries in Ghana through which two (2) major online health platforms were identified. Further, through the strategic selection of cases which focuses on the underlying purpose of this study, two online health infomediaries were chosen. Contacts of the two health infomediaries were obtained, calls made and consent to participate in this research was obtained. The selected case firms that agreed to participate in this research were Ghana Health Nest and Ghana Health Online

4.5 Data Collection Methods

In conducting this study, data was collected from multiple sources. Creswell (2002) and Merriam (1998) are of the view that case study research requires an intensive data collection, using multiple forms of data to offer an evaluation of the activities being studied. Similarly, Benbasat *et al.* (1987) suggest that a case study must employ two or more sources of data and these sources must converge in order to support the research findings. As a result, collected data from multiple sources for this study included informal discussions, observations, and semi-structured interviews. From the critical realist stance, these multiple sources of data would augment the triangulation of participants' perspectives and also provide a rigorous approach for collecting and analysing data.

4.5.1 Interviews

The study made use of semi-structured interview questions as a major source of data collection. The questions asked were specifically directed at meeting the objectives of the study (see Appendix A). This process was reviewed three times with the guidance of the researcher's supervisors making sure the right questions were asked. In assessing the viability of the questions, a pilot interview was conducted with one online health information developer which led to the development of a suitable interview guide. The interview guide as its name suggests was to guide and direct the interviewer to ask only questions that spanned from the theory used and also aided in examining latent motives. For instance, the background of the OHIP, objectives, et cetera.

The first interview was with Ghana Health Online, (GHOL) it is a web-based platform that provides a connection between Healthcare seekers and Healthcare Providers. The founder of GHOL was engaged in an interview session which lasted for approximately thirty-four minutes. The founder of GHOL is a medical sonographer by profession. Since the founder is not an expert

in web development, individuals with in depth knowledge in web development has come together to work as a team. Web contents were reviewed to ensure whether the information considerably confirmed information earlier collected through the interview. Response from interviewee was mainly audio-recorded and alongside taking notes. Data collection was discontinued because there was no new information to be obtained.

Also, at Ghana Health Nest, the manager who is the founder, assistant manager also a co-founder, and social media strategist were interviewed. Ghana Health Nest (GHN), is a health media agency which provides credible health news, information and digital innovations to improve healthcare and decisions which enhances health. Additional information from their website was reviewed. When no more information could be obtained, data collection was discontinued.

4.5.2 Documents and Archival records

In order to achieve data triangulation, multiple methods including the use of documents and archival records to confirm the findings or data obtained from the interviews were used. The archival records of data were basically web contents.

Table 4.1: Documents and Archival records examined

Document	GHOL	GHN
Web contents	To assess additional information which were not collected during the field interview. E.g. detailed profile, information on other services.	To assess additional information which were not collected during the field interview. E.g. detailed profile, information on other services.
Flyers		To assess other information which was not mentioned
Documents	To obtain extra information that was not captured. Eg. Books, Policy document.	To obtain extra information that was not captured. Eg. Books, Policy document.

Source: *Author's Construction*

4.5.3 Ethical Considerations

The ethical position within the social science research has to do with the wrong and right in the research process. Researchers no matter their research designs, sampling, techniques, and choice of methods, must comply with an ethical code (Gratton & Jones, 2010). In fulfilling all ethical considerations, an official introductory letter to the selected online health information platforms from the department was obtained. Again, during the interview, permission to use an audio recorder and also to take notes was sought from the interviewees. While the recorded audio was transcribed later, the written notes provided cues for follow up questions. In order to respect the interviewees time, interviews were conducted at their convenience. On average, the interviews lasted for thirty-five minutes. Also, transcripts, records, and their trade secrets were kept secure

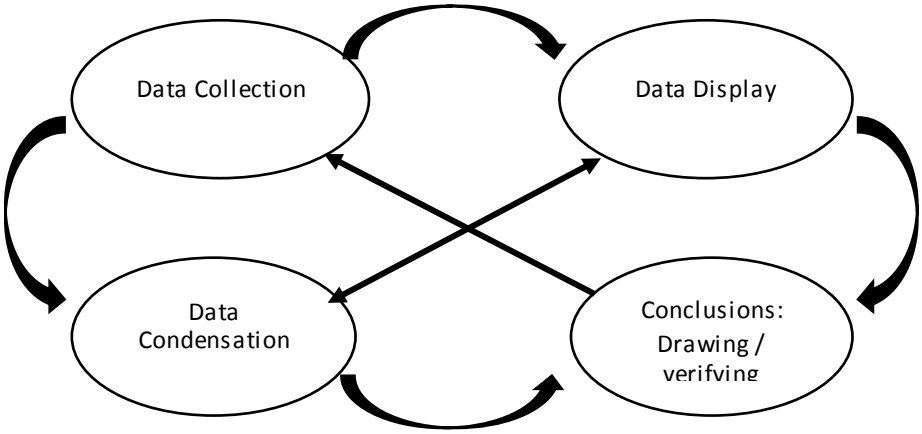
and confidential. Finally, before presenting the results, feedback was sought from the interviewees to cross-check for factual matters.

4.6 Data Collection and Analysis

Boateng (2018) asserts that data analysis begins while the qualitative researcher is gathering data. The data collection was done from August 6th to October 9th, 2018. The researcher made notes while collecting the data, organised and categorised data in respect to its relevance to the research questions. In all, three interviews were conducted which was recorded on tape, that is Ghana Health Online and Ghana Health Nest. Also, web contents was reviewed to gain more insights. After transcribing the interview, the transcribed interview was given to the interviewees to review the content. This was to ensure that what was transcribed represented their expressed views.

According to Bogdan and Biklen (1992), qualitative data analysis is working with data, organising it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned; and deciding what you will tell others. This research adopted the Miles and Huberman's (2004) transcendental realism technique which highlights three main components for analysis; data reduction, data display and drawing and verifying conclusions. The figure below shows the three components.

Figure 4.0.1: Mile and Huberman's Data Analysis Approach



Source: *Miles and Huberman (2004)*

4.6.1 Data Condensation

Miles and Huberman (2013) refer to data condensation as the process of selecting, focusing, simplifying, abstracting, and or transforming the data that appear in the full corpus (body) of written-up field notes, interview transcripts, documents and other empirical materials. Boateng (2018) further asserts data condensation begins when the research is at its initial phase and runs through the whole process of analysis. This process was characterized by two different stages namely early coding and memoing. In the early stage of data condensation, the researcher summarized the collected data so that the essence of the interview was rather presented and not the actual words from the interview or the discussion.

After summarizing the collected data, coding followed. Thus, data was categorized into meaningful sections and labels were assigned to each segment as well as combining codes into

themes after descriptive codes as suggested by Miles and Huberman (2013). The descriptive codes were revised and re-categorized into sub-codes as more data from the field study was being analyzed. Also, the researcher read through the raw data for cases that illustrate the analysis looking for similar, confirmatory and contradictory data. Finally, memos were created, thus, the ideas generated from the codes in the data were theorised to establish relationships among the codes. According to Boateng (2018), a memo is created when data (a sentence, paragraph or few pages) finds links with theory and previous literature discussion. Every point of ideation was recorded as memos. This led to the initial steps of propositions development.

4.6.2 Data Display

As asserted by Miles and Huberman (2013) a display is an organised, compressed assembly of information that allows conclusion drawing. The data obtained were organized into tables, figures and diagrams to establish insights about the data. The summarised data aided in establishing themes and issues for future analysis (Boateng, 2018).

4.6.3 Conclusion Drawing and Verification

As argued by Miles and Huberman (2013), reducing and demonstrating data aid in drawing meaning conclusions from the data. During the data condensation stage, early conclusions were identified, however, these conclusions had to be verified through pattern-matching of noted themes and checking for representativeness of the identified patterns et cetera.

4.7 Chapter Summary

Chapter four began by discussing the research paradigm and the methodology adopted for this study. The critical realism paradigm, qualitative research approach, and single case study design were used for this study. The chapter further discussed the criteria for selecting case firms, data collection methods and the approaches for data analysis. The next chapter presents the context of the study and presentation of findings.

CHAPTER FIVE

RESEARCH ANALYSIS AND FINDINGS

5.1 Chapter Overview

Research methodology was described extensively in the previous chapter. This chapter discusses the findings from selected cases based on the research purpose and questions. An overview of health infomediaries is presented. The chapter also lays emphasis on the findings to provide a foundation for the presentation of the case findings.

5.2 Health Infomediaries in Ghana

Health infomediaries provide consumers with reliable health information and effective communication tools. Recently, several information and communication technologies has been inculcated in making healthcare delivery more effective and efficient. The government of Ghana launched National eHealth policy in July, 2010. The key policies under this scheme is to streamline the regulatory framework for health data and information management, build sector capacity for wider application of eHealth solutions in the health sector, increase access and bridge equity gap in the health sector through the use of Information and Communication Technology. In the wake of this strategy, several privately-owned online health information platforms were launched purportedly to support the eHealth programme. Notable amongst these were Ghana Health Nest and Ghana Health Online, which were used as the case studies.

5.3 Findings from Ghana Health Online

The following subsection presents findings from Ghana Health Online. Its profile, motivational factors, use, growth, and constraints are presented. The motivational factors under each phase of the platform using the TACT are also presented.

5.3.1 The case of Ghana Health Online (GHOL): Brief Profile

In the ecosystem of OHI as constructed by the researcher (see Fig 2.1), Ghana Health Online (GHOL) is conveniently described as an Infomediary given the unique role they play. GHOL provides timely comprehensive and relevant health and medical information, news and resources to the general public making them more confident and assertive about health-related issues to ensure a healthy living in our everyday life. Not only does GHOL seeks to serve the public but also targets health professional and other healthcare providers who will benefit from the content that will be available on the website. It also provides the perfect platform to connect the Healthcare seekers to the Healthcare Providers. Unfolding the history of GHOL during the interview, the founder revealed that

> "*The idea to set up a platform solely for health information started around 2014 but it was launched somewhere 2016, and it became available to the public the same year.*"

In relation to the need for the development of ghhealthonline.com platform, the founder indicated:

> "*after conducting some research on the internet concerning the availability of health information and resources to the general public, I realized that there were some limitations to health information unlike the social political web portals like myjoyonline, peacefmonline, they were all over the place but we didn't have any dedicated page online that you can go and it's all about health*"

One important domain in which the internet plays an increasing role is health information access, considering how easy it has become to Google search symptoms and causes of diseases, this for consumers helps to avoid long queues (waiting hours) that have been characteristic health care access in most developing countries. Owing to the growing demand for online health information by Online Health Information Seekers (OHIS), the founder further disclosed:

> "*I want health information to become accessible to every Ghanaian regardless of age, race and gender.*"

Additionally,

> *"this initiative has always been my dream and I am passionate about it, although I am a medical sonographer, I didn't wait for my facility to start this initiative. I was happy and had a sense of satisfaction when this dream became a reality."*

5.3.2 Motivational factors

The development of the GHOL platform was based on several motivational factors. This section focuses on some of the motivational factors that caused the development of online health information platforms. Findings revealed the motivational factors were mainly datafication and commodification.

5.3.2.1 Datafication

Online health information sites are developed for various reasons which includes commercial purposes, for non-profit reasons such as public policy. An example of non – profit health platform is aimed at improving the health of the population or at increasing the efficiency of the public healthcare service or altruistic or collective self-help reasons, such as a desire to help and learn

from those with similar health problems. Datafication is the most fundamental component of online health information which means that every aspect of one's physical or mental well-being is translated into data. It further explains the concept of making an online health information platform relevant to users based on the information it provides. Findings revealed the main motivation behind the development of the GHOL platform was to make health information accessible to both consumers and practitioners. The founder indicated that;

> "*in the past physicians had control over health information relayed to patients which made them autonomous so I was motivated to develop this online health information platform.*"

He again added that;

> *"Searching for health information online was new to our health ecosystem in Ghana so coming out with such initiative was mainly to increase patients' knowledge of their health status.*"

He further explained that;

> *"Independent online inquiries can complement and be used in synergy with doctor-patient interactions in the clinic, which often become highly time constrained. Patients now have the ability to find answers for additional or forgotten questions, as well as the opportunity to explore sensitive or embarrassing questions in the comfort and privacy of their own homes".*

5.3.2.2 Commodification

Commodification refers to the way in which datafied information is transformed into (monetary) value. In most cases, this means health products can be sold to consumers and sometimes in combination with advertisements. The founder made this assertion;

"*Sometimes I will receive calls from some of these pharmaceutical to advertise some of their products.*"

He further disclosed;

"The site is designed in such a way that, a portion is dedicated for the advertisements of health products as well as a list of pharmaceutical companies and laboratories."

Recounting on the initial motivational factors which was based on datafication, the founder iterated;

"*We know that in future when the site becomes very popular and we generate so much traffic, there will be avenues where we can use to raise funds. I know Google has Google AdSense which you can sign up. Even when I started, they sent request but before then they will review your site to see if you are at their level and they can allow you to feature certain adverts for them on your page and they will pay you on the number of people who visits your site. I am hoping to get my site popular like myjoyonline, peacefmonline and etc to generate funds.*"

5.3.3 Use of Online Health

With the increasing availability of online medical information sources, as well as the desire to take more responsibility for health and controlling costs, a growing number of individuals use the internet to find health related information as such health information must be accurate. Consequently, it was revealed that most users seek online health information without consulting medical practitioners to confirm the reliability of the information in relation to this the founder responded;

> "*Although as a medical sonographer I found myself depending so much on online health information and I can say for a fact that majority of healthcare workers rely on online health information because either they feel shy to consult a doctor within the same facility or feels they can get accurate health information online".*

To ensure authenticity and accuracy, the founder iterated;

> "*I have a team that is made up of media men, doctors that review the content that is put on the internet. Although the team is not very strong notwithstanding we are open to accept opinions from any certified health professional. As a result, I manage the day to day activities of the site in order ensure accuracy and consistency."*

With the advent of the internet, it has become imperative to find ways to utilize it to improve the livelihood of people and the director orates,

> "*I and my team do not have a particular group of users as our target group, our main focus is to make health information accessible to all Ghanaians and even beyond. As such the information put on the page suit all age brackets.*"

Since the use of online health information is still in the introductory stage, steps have been taken to advertise and make it known, the founder further iterated;

> *"I was interviewed by one of these media stations specifically Accra fm on my platform and it paved way for people to know much about my platform."*

He further stated;

> *"There was a time I had a mail from Al-Jazeera specifically the in-charge of Online Health Africa and they contacted me because they wanted to know much about my site and how they could partner with me to share more information.*"

There are other things that generate a little traffic to our site. For instance,

"*we have a page that attracts the medical doctors, it is about their continuous program development or training. It gives them information about their training schedule which is done through the year.*"

Further, the founder revealed;

"*when you look at the backend you will realize that there are different people from different places who visit the site across the world.*"

5.3.4 Constraints

A technology constraint describes how technology can hinder individuals or organizations from accomplishing their aims and objectives. Technology is said to make life easier and enable work to be faster, however, there are some pitfalls with the technology application. These pitfalls can be the technology itself, the users or the environment in which the technology is been employed. When the technology in use is not user friendly or it's difficult to work with, it makes the learning procedure on the part of the users challenging. The constraints as the findings revealed were largely technical, financial and regulatory. The following subsections discuss these constraints as discovered from the interview.

5.3.4.1 Technical

Despite the affordances and benefits of the Ghana Health Online platform it had some challenges. Which the findings also reveal that;

"*Although, I am not a developer but I have IT knowledge. I contracted a developer to get my site done whilst I supply the necessary information. Therefore, when there are some*

downtimes that is beyond my scope then I will have to contact the developer to either work on it electronically or physically".

The founder further added;

"With the electronic approach, he logs in remotely and fix the issues; and with the physical approach, he will have to come to the case and rectify the issue. This sometimes delays the accessibility of the site by users or consumers because when the system is down it affects the intended traffic I want to generate."

5.3.4.2 Financial

It can be argued that the initial cost of developing a website is expensive as well as its maintenance. In relation to finances the founder said;

"*Owning a website is accompanied by additional cost of ensuring constant update of current health information for the effective running of the platform*."

In addition;

"I have to get a quality hardware and software to equip my team to work effectively. The cost of maintaining the site is high me because of I outsourced the post implementation cost and because it was outsourced."

5.3.4.3 Regulatory

Regulators can be either public or private organizations that develop capabilities for standards-based, secure and confidential exchange of health information to improve the coordination of care among the online health stakeholders. In order to conform to all standards, he mentioned

"We wrote a letter to the Ghana Health Service (GHS) to inform them of the operations of our site and also to make sure they check the content on our page for accuracy before it goes out for public consumption"

However,

"I was told the ministry of health is yet to publish standards for digital platforms. I was then cautioned to make sure original and proper citation should be made to avoid plagiarism."

Figure 5.0.1: GHOL Homepage

5.4 Findings from Ghana Health Nest

The following subsection presents findings from Ghana Health Nest. Its profile, motivational factors, use, growth, and constraints are presented. The motivational factors under each phase of the platform using the TACT are also presented.

5.4.1 The Case of Ghana Health Nest: Brief Profile

Ghana Health Nest (GHN), is a health media agency which started in 2012. GHN website is powered by Vessel Media, a registered Media Agency with the registrar General's department. It is not affiliated with any medical or drug organization, therefore the mainstream information presented on Ghanahealthnest.com is unbiased. GHN's mission is to provide authentic and credible health news and information to influence personal and community decisions that enhances health.

GHN was born out of the manager and his assistant's keen desire to bring innovation to the health sector, and the circulation of accurate health news using digital technologies. The manager and his assistant during their last semester in school developed the interest in this area and started working towards it. The manager asserted that:

> *"In my final year as nursing student, myself and my assistant had the privilege to attend a workshop on digital health at the Kofi Annan ICT centre. At the training, we met another student who had technological skills in social media management and computer graphics so we asked him to join our two man-team as our social media strategist. After he agreed, we started brainstorming on business ideas and how to go about the business formation. After a number of meetings and brainstorming sessions, out team became solid and rolled out operations in 2015."*

After the workshop, the co-founders came about the idea of helping other health sectors grow through digital healthcare delivery. Through the workshop, they realised that the case of the Ghanaian health sector and products is dominated by referrals from friends or relative and the traditional means of advertisement; television commercials, billboard advertising, brochures among others. These modes were old fashioned which needed to be replaced with current trends in healthcare delivery. The social media strategist made this assertion;

> "*The new digital revolution provides healthcare institutions the ability to engage better with clients*"

More time was spent in coming up with a strategy to enter and penetrate the digital health care industry. The manager further explains:

> *"We came out with a checklist: entry strategy, building a website, media partners, registration and so forth. And we met regularly to discuss how we could enter the health care sector."*

In the words of the social media analyst:

> *"After the workshop, we asked ourselves what next? We then came about the idea of helping other institution grow through our digital services and event coverage."*

GHN has four major activities as its focus. They are health and medical information – this focuses on celebrating the people behind pertinent health issues and achievements, advocacy/community health campaigns - focuses directly on communities that face public health disparities and other socio-economic issues related to health, digital health services - offer services through coaching/training's to equip healthcare institutions and related professionals in ways to use the best of online and mobile technologies to power healthcare, and event coverage - to cover health

events and activities to give in issues that strive to promote and enhance the health care and lifestyles.

Consumers access information from a range of sources and for varying purposes, based on their specific needs at the time they seek it. According to the manager,

> "*I have to put in place certain measures as a manager and an editor to improve my ability to churn out credible information, truthful and useful information. As a result I have taken short programs in terms of health communication, online health information, health journalism program all from Ghana Institute of Journalism.*

He further explained that;

> *I tried to do it myself in terms of the communication bit and continue to maintain good relationship with public health institutions in a way that to understand the consumer, in a way that to understand what the health professional needs in terms of when they are online and need information. With my professional background as a nurse, I have upgraded in quite a number of programs that equally help me to understand the profession, to understand the information they give out, to understand what the patient needs*".

GHN is made up of three members; two of which are the co-founders – the manager and the assistant manager who also doubles as health journalist and a social media strategist who sometimes do graphic designs.

The manager is a certified professional nurse, has an undergraduate degree in nursing, and also in his first year at Institute of Journalism pursuing a Journalism. The assistant manager is also a certified professional nurse. He has an undergraduate degree in nursing and currently in his first year pursing a diploma in computer graphics at IPMC. The social media strategist has a degree in

computer science. GHN has strategic partnership with ministry of health and as such gets the recognition as a partner agency in the health sector.

GHN IT infrastructure consist of three laptops used by the two co-founders and the social media strategist, MTN Broadband internet modem and one printer. The co-founders use their personal mobile phones to serve as company telephone.

5.4.2 Motivational factors

The findings revealed that the development of the GHN platform was as a result of several factor of which commodification emerges as paramount. This section focuses on some of the motivational factors that caused the development of online health information platforms.

5.4.2.1 Datafication

There are several ways in which patient-support websites position themselves as for profit, not for profit and somewhere in between. Patient Opinion, for example, is a solely not-for-profit platform and makes this clear on its site. Some platforms represent themselves as a free service for researchers or companies who want to make use of these data (for example, Health Tap). The GHN About Us pages describe their model as for-profit but 'not one with a "just for profit" mission', suggesting their dual purpose: to seek both to help patients and also to use the data they provide for their own financial gain as part of a business enterprise. The manager made this assertion

> "*Growing up, one of the things I do to keep me informed was to read posters to read papers. I pick graphic and read them when I see them on the ground and I used to read them so probably I think that character stayed with me. So some of the information especially the*

training of workshops that are due for health professionals or an event that due for health consumers I look out and then I share the information. "

Again, the manager added;

"*With time others decided to pick that we had direct and also, when an event is about to happen they call me to be involved from the planning stage through to the implementation stage. At the end of the day we get paid.*"

The manager further explained that;

"*Searching for health information online is new to our health ecosystem in Ghana so coming out with such initiative is mainly get a niche for my site*"

5.4.2.2 Commodification

The GHN About Us page describe GHN model as a commercial site that leverage on the data they generate for financial gain. There are various ways in which patients' experiences of illness and health care can be commodified. The manager made this assertion;

"*I and my team was always thinking of how to generate funds to run our programs. Initially we thought of print media but we realize we didn't have enough funds, and thankfully within that same period was when the advent of Facebook and social media was picking up as result we took an advantage of that opportunity to leverage on. GHN now funds its own activities through revenue generated from its extra services and advertisement*"

The manager further added;

"We do training on healthcare communication and social media for healthcare practitioners at a fee. Currently, we have clients under training on health care

communication and social media healthcare delivery. Very soon we will start training on health journalism"

5.4.3 Use of online health

Health infomediaries provide consumers with information about health and diseases, as well as information about lifestyle, medicines and supplements. Examples include dedicated sites such as WebMD and Patient UK, as well as numerous blogs concerning health matters and websites that include health information as part of a wider range of services, such as BBC Health. Some websites that fall into this category provide mechanisms that facilitate self-diagnosis. The assistant manager asserted;

"*I wasn't happy with the way journals were reporting health issues because believe you me, e every news item on board encourages people to take an action. So how are we enforcing people to take an action, is it an informed position, a credible information or it's simply a sensationalism. When we look at statistics and figures that they want to put across, some are done to probably suit their sponsors or their agenda and then the issues that encourage people to take action on in their homes and in their communities. GHN can do that through news and through information we give out*."

Again the assistant manager iterated;

"*GHN is a place designed for people of different national but more especially Ghanaians, cultural and religious backgrounds and ages (starting from 13), to share valuable information about medical and health related concerns, and help each other with personal experiences and true testimonials*"

GHN is intended for use by health professionals and everyone else whose goal is to improve his/her own life style and self-satisfaction. The social media strategist made it known through the interview that;

> *"I have been able to liaise since we started with WebMD and recognized health institutions for our online news, we get people bringing us with feedback and others asking questions."*

He added;

> "*We recently did a news item on yellow fever and urging readers to seek clarifications. And we were surprised at the number of hits we got. This also tells us what other information people are looking for, then we put that together and give it out as well*"

5.4.4 Constraints

Despite the affordances and benefits that the platform portrays, there are some challenges that accompanies it. The following findings are presented some constraints that are presented below technical, financial and regulatory. The subsections discuss these constraints as discovered from the interview.

5.4.4.1 Technical

With regards to technical constraints, the social media analyst iterated;

"*Because some of the sources for our information is not merely the one you will see from the institutions here, but we also pick information from Journals when they release information and we confirm the stories. Also health news websites that have published stories, we also have copied from them and sourced them, and so if there is anything that we have to use to check the credibility of it, yes sourcing."*

Further, TACT also states that technology can also afford or constrain users from using technology. *"For instance, when there are network challenges, the users will not be able to use the platform to perform their activities."*

5.4.4.2 Financial

GHN, funds its own activities through revenue generated from its extra services and advertisement. It relies on support from people, groups and organizations for its community health campaigns and initiatives. The manager made this assertion;

> "*We had to device some mechanism to fund ourselves. So one of the things is we do what we call contact production. This is in a way positioning you in the minds of your clients and general consumers. So articulating health stories like the past months ago, we suggested to start the breast cancer stories so that people could share their stories and we define what we will do and do the number of items for you and we charge a fee for that*"

5.4.4.3 Regulatory

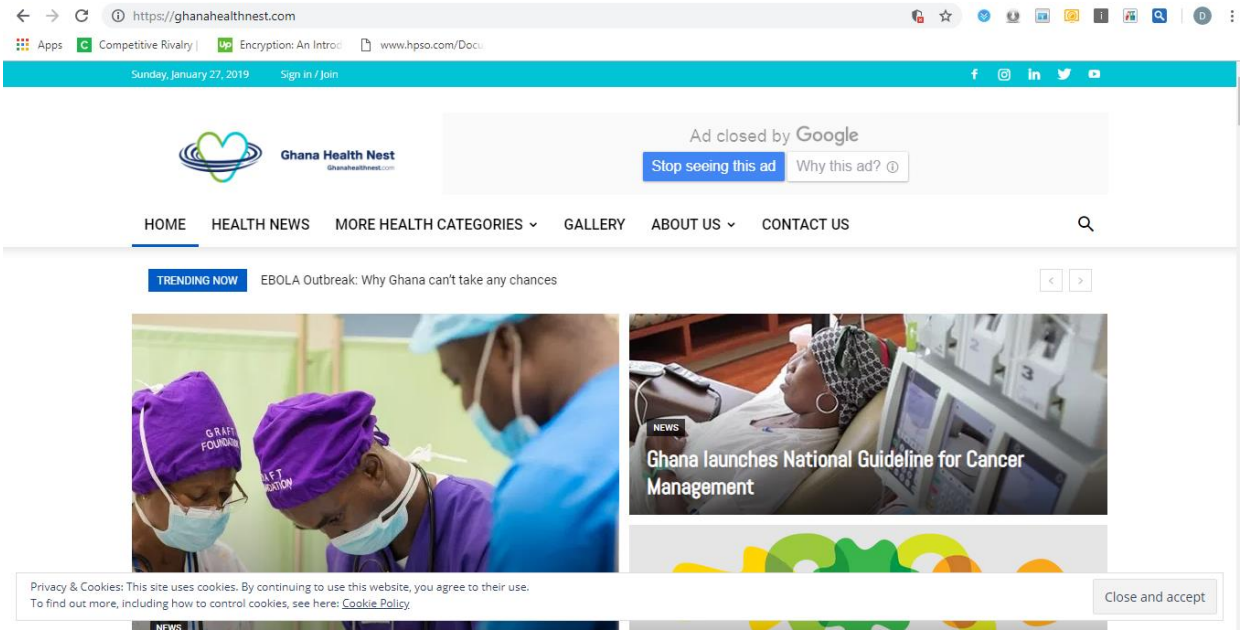
The Ghana constitution equally gives the media that it already covers the media's right to the information they give out, making sure that they are credible, that they are checking systems that are in place. GHN was registered as far back as 2011- 2012 at the Registrar's General Department to be able to incorporate. The manager confirmed

> "*When it comes to regulation as a business entity or whatever, we are getting checked each day and comply the laws of the country*"

With regards to Standard Operating Procedures for Online Health Information Platforms (OHIP), the manager replied;

"I haven't seen it yet and we do not have any interaction on that. But like I said, key of it all is that, at the end of the day, it's a media work. So they will look at certain structures in place and that is one of the key things. So structures like whatever u are producing, the truth and all that and that is governed by the Constitution".

Figure 5.2: Snapshot of Ghana Health Nest Webpage



5.4 Chapter Summary

This chapter offered a detailed description on the cases under study. It focused on the two online health platforms i.e. Ghana Health Online and Ghana Health Nest. The motivation behind each platform how technology affords and constrain them in their operations. The next chapter focuses on the analysis and discussion of the findings presented in this chapter.

CHAPTER SIX

DISCUSSIONS OF FINDINGS

6.1 Chapter Overview

The purpose of this study is to investigate the latent affordances and motivational factors behind health infomediaries in a developing economy through the lens of Technology Affordance and Constraint Theory. The preceding chapter discussed extensively the selected case for this research. This chapter therefore cohesively brings together all the previous chapters, interprets and explains the findings, critically evaluates the study through the theoretical lens to seek answers to the research questions.

6.2 Analysis of Findings

This subsection summarizes the findings in the previous chapter by interrogating the data to pull out emerging issues for discussion

6.2.1 Motivational Factors behind the development of Ghana Health Online

The technology affordance dimension of the TACT explains the motivation behind the adoption, implementation and use of a technology. From the findings, it was revealed that online health information platforms are developed primarily for two main reasons namely; Commodification (for profit making) and Datafication (not for commercial purpose but for sharing health and wellness related information). The analysis of the development of each platform is presented below.

6.2.1.1 Analysis of the Motivational factors of Ghana Health Online

Ghhealthonline.com is a web-based service that provides the timeliest comprehensive and relevant health and medical information, news and resources to the general public making them more confident and assertive about health-related issues to ensure a healthy living. The platform was launched in 2016 with the fundamental aim of sharing health information to the general public. This initiative findings revealed, was characterized by creativity with the online platform seeking to challenge the traditional way of providing health information to the general public including health professionals.

Over the past decades, the quest for online health information was largely the preserve of health professionals. However, the proliferation of online platforms and internet accessibility has afforded users unlimited opportunity to search for health-related information online. This development afforded application developers the opportunity to come out with online platforms from which health information is made available. That notwithstanding, the motivation behind the development of the platform is inherently the developers' discretion. Thus far, after an extensive enquiry into how to complement the efforts of health practitioners in the provision of health information, it was clear that limited platforms exist in Ghana hence, the development of the GHOL. Findings from the interview revealed, GHOL was set up to change the status quo of health professional monopolizing the use of online health information especially in developing economies. Hitherto, patience can interact with health professionals online for quicker solutions to their health needs. Findings revealed the development of GHOL consequently, afforded patience the opportunity to find answers to their health needs in comfort as well as with their privacy conserved.

An area of interest for website developers is revenue generation. For this reason, website developers are including several revenue generation modules such as placement of adverts, and in some cases making the website look more of an e-commerce platform. Online health platforms across the world are noted with several advertisements and other commercial activities besides the core purpose of the site hence, commodification. Analysis of the GHOL reveals, the focus of the developer to this end, is to make the platform a hub for the provision of quality, accurate and timely health information to the general public. Besides, it was evident that GHOL have received offers from organizations such as Google AdSence, hospitals, clinics, medical laboratories, pharmaceutical shops and local pharmaceutical companies to place adverts on the site but the developer insists this is not the opportune time to commercialize the platform. This was as a result of the fact that the developer does not intend to shift the main focus of the platform in the interim hence, would prefer to provide the needed health information to making the platform a commercial online platform.

6.2.1.2 Analysis of the Motivational factors of Ghana Health Nest

Ghana Health Nest (GHN), is a health media agency which started in 2012 and its mission is to provide "authentic and credible health news and information to influence personal and community decisions that enhances health. With the explosive growth of information technology (IT), emerging infrastructures and devices, the provision of healthcare is increasingly taking place supported through the use of these technologies. Healthcare services can now potentially be provided to anyone, anywhere and anytime through these innovations. These services and technologies provide patients, doctors and healthcare organizations immediate access to healthcare information for efficient decision-making as well as better treatment. Since health is development,

societal impact is enabled through effective implementation of new innovations aimed at improving healthcare delivery.

The findings revealed GHN platform was born out of a desire to bring innovation into the health sector by leveraging on digital technology to transmit health information. After attending series of workshops on digital health strategies, the motivation to drive this initiative was heightened. Again, the lack of innovations in the delivery of timely and accurate news on health motivated the developer to start the initiative. Health information in developing countries has largely been circulated through referrals, television commercials and other traditional media, however, according to the findings the gap was on online based platform, thus, the development of GHN platform. It was evident that the development of the GHN platform was hinged on four main areas namely, medical and health information, community health advocacy, digital health services and other auxiliary digital health services such as the provision of heath tips via sms and health event organization and coverage. The findings suggest, coming out with such an innovative platform for the managers was a novelty since the advent of online health information in the Ghana health service ecosystem is still under its initial stage. This suggest their vision was more to bridging the gap between health professionals and health information seekers.

On the dimension of commodification of the platform, it was evident from the findings that, though the motive is to make the platform more of health information dominant, it is engaged in other commercial activities to generate money. A cursory analysis of the portal reveals several advertisements are placed on the platform including other commercial activities mainly for monetary gains. This suggest the motivation for the development of the platform was not only

hinged on the provision of health and medical information but to engage in other commercial ventures.

6.2.1.3 Case comparison of motivational factors of the two online platforms

Both case platforms were motivated by the fact that there was a gap in the provision of health information to the general public. This gap led to the development of the platform. However, each had some form of intrinsic motivation behind the notable choice. Thus far, it can be deduced from the findings that, GHOL currently is focused on pursuing the set-objective of making health information easily accessible. On the other hand, GHN in spite of being motivated by similar vision, had another objective, thus to use the platform as a form of commercial place to advertise products and services of clients. It is however instructive to note that both cases have an ambition of being among the finest health platforms in the provision of health and medical information through an online medium. Thus, they are making all efforts to make their portals more attractive to users of the platform. For this reason, GHOL for instance envisage to propagate more of health and medical related issues in the interim whilst looking at making the platform a commercial place for advertisement in the future. For GHN, income generation is important towards sustenance of the platform and attracting more users hence, commodifying the platform for capital gains. Table 6.1 summarizes some of the motivational factors based on the analyses of both platforms.

Table 6.1: Analysis of Motivational Factors Based on Platforms

Motivation	**GHOL**	**GHN**
Health/Medical information	✓	
Health/Medical news		✓
Live chat	✓	✓
Feedback section	✓	✓
Social media handles	✓	✓
Link to external health sites		✓
Advertisement		✓
Event coverage		✓

Source: Author's construction

6.2.2 Affordances of Ghana Health Online

In relation with the TACT, affordance defines the use of a technology or an information system defines the affordances of online platform. Technology plays a vital role in systems development and implementation and can therefore afford stakeholders on diverse areas to make work easier. The adoption of technology enabled users to work effectively and efficiently. The findings identified the following affordances of Ghana health online platform through the lens of TACT. The GHOL platform was developed with special features and affordances purposefully to offer an efficient and effective service to consumers. Thus, consumers are able to interact with the system beyond the technical functions and goals of the developers. Ghana health online platform afforded the developer self-aggrandizement, thus when Aljazeera contacted the founder it was seen as a

promotion that could possibly lead to future roles in the society. The organization of Ghana health online is to share health information and provide list of certified healthcare, pharmacy and laboratories in Ghana.

The findings suggest information available on the platform is not only relevant to medical practitioners but to consumers of health information at large. For instance, the manager of the GHOL platform who is also a medical sonographer acknowledges that he is also beneficiary of most of the information that is put on the platform. In order to satisfy all users of medical and health information he make sure that the information is of value. Again, analysis of the findings indicate that GHOL has a team of medical practitioners who review contents before they are put on the platform. This is to ensure that accuracy and quality is maintained such that the information would not compromise the health of users.

It was noted from the interview that, GHOL do not have specific targeted users as such their goal is to serve all consumers and users of health information. Specifically, it was noted that, the platform has a page dedicated for scheduled training programs for medical doctors and other allied health professional. The page according to the findings is mostly visited. This suggest the level of participation of users across all spheres of endeavor such as medical, health or ordinary users. Analysis of the level of visit to the platform according to the findings reveals the site is increasingly being visited from locations across the world. Consequently, it was revealed GHOL had been contacted by Al-Jazeera to partner them for their online health programs in Africa.

6.2.2.1 Constraints of Ghana Health Online

In spite of the relative importance of the platform to users, TACT affords users to identify factors which constraint the use of the technology. Notably, the findings revealed GHOL was constrained by technical challenges, financial support and the absence of regulation in the digital health sector.

Technically, analysis of the findings revealed GHOL was constrained because the manger was not the developer though he is computer literate. The development of the platform was contracted to a web developer while he supplied the information. Furthermore, the hosting and maintenance of the site was been outsourced. It was evident that, in times of server downtimes, the manager has to personally call the developer to fix the problem. The manager checks the site intermittently for downtime to be sure the platform is active. This suggest the intermittent downtime poses as a major technical challenge to users. Thus, affecting the targeted number of visits to the platform.

Financially, analysis of the findings indicates challenges of the platform in several ways. For instance, cost associated with hosting and maintenance services, motivation for team members and transportation. This suggest owning a website of this nature comes with several cost. Management of the platform is also challenge in relation to the purchasing of tools and equipment for team members to be able to gather timely information.

Arguably, there is no regulatory framework guiding the publication of health information in Ghana. Analysis of the findings suggests, Ghana as of now, do not have any law that regulate digital content specifically for health and medical publications. Further analysis of the findings indicate management have sought permission from the Ghana Health Service (GHS) to be in the

known of the operations on the platform. Thus, GHS regularly check on the platform to make sure content published are not against the public health regulations Act. Findings revealed the Ministry of Health (MOH) is yet to draft a policy to guide the publication of health information on any digital medium or platform.

6.2.3 Affordances of Ghana Health Nest (GHN)

Online health information platforms constitute a varied resources for users to access and utilize. Analysis of the platform revealed it provides varied services to consumers. GHN has incorporated several segments including news and feature articles on health related issues. The health news segment of the portal basically tell health stories, educate and simplify everyday health issues trending globally. Through the platform, GHN provides digital health services through coaching/training to equip healthcare institutions and related professionals in ways to use the best of online and mobile technologies. Further, in this case study, a trace was found of infomediaries in Ghana, purposively collecting user data to provide better services or sell the data to other interest parties. GHN brings health consumers closer to health events and activities that strive to promote and enhance the health care and Lifestyles in and around Ghana through event coverage. This suggest the platform serves multiple users of diverse needs. However, it is noted, information available on the portal are largely health news, thus, information on featured medical articles and research work by seasoned medical practitioners are limited. This again suggest users of the platform are largely health news consumers.

The growth of online health platform is being driven by a powerful set of arguments that can be regarded as a discursive regime informing a commons sense logic. Further analysis of the findings indicates GHN offers personal and organizational solutions to medical and lifestyle challenges while also contributing to the public good. For instance, improving public health, educating a general audience, or contributing to medical research. Arguably, Ghana Health Nest is a hybrid platform that highlights on datafication and commodification. As a commodification platform, GHN affords to advertise, train health professionals and do event coverage all at a fee.

6.2.3.1 Constraints of Ghana Health Nest

Despite the affordances and benefits that online health platform portrays, there are some challenges that accompanies it with GHN not isolated. Technically, analysis of the findings showed GHN inability to source new and current information for their client as their major challenge. As noted, the team mainly source new and other information from other credible online portals. Thus, the lack of technical staff who are IT savvy to help source news and other relevant medical information using modern technology. Stable internet connectivity is also another challenge GHN faced. The findings indicated that, because the platform depends largely on the outsourcing for news and other information, it heavily depend on internet connectivity. Consequently, slower connections affect the pace of their work. As noted in the interview, publication of information is sometimes delayed as a result of poor internet connectivity.

Financial constraints affect the quality and timely publication of health information on the portal. This was noted in the findings. Thus, management of GHN is not able to provide the needed financial support for the numerous activities it is undertaking to make sure the portal stays active.

For instance, funds to acquire the needed IT tools or infrastructure to support field worker in their gathering of information is a challenge. Again, it was noted that GHN platform is also active in other health social media campaigns. Consequent to this, it is engaged in several social media activities adding to their cost of operations. The amount of money generated from advertisement and other commercial activities yield relatively low income. Thus, GHN inability to financially resource their operations.

Arguably, Ghana does not have any law regulating online health contents. This has resulted into the publication of several articles and news stories which are inaccurate. The findings from the GHN on regulatory framework was not different from the previous case. This suggests the lack of policy guidelines to check and guide online health platform and its content.

6.3 Discussion of findings

This subsection offers a discussion on the analyzed findings and further synthesize with literature. This is aimed at answering the research questions of the study. The discussion is divided into two parts which reflect the three research questions and the latent issues in-line with the underpinning research framework. The three research questions are:

1. What are the motivational factors behind the development of health infomediaries?
2. What are the latent affordances of health infomediaries?
3. What are the challenges faced by developer's of health infomediaries?

6.3.1 The Motivational factors behind the development of online health platform

This section presents the discussion on the motivational factors behind the development of online health platforms. The section also seeks to answer the first research question of identifying the motivational factors behind the development of online health platforms.

From the analysis of the motivational factors of both cases, two distinct factors can be identified. These factors are relevant to the purpose for which the platform is set up and additional factors which come along during the development of the platform. That notwithstanding, these factors are not statistic. They change along with the development phases of the platform in order to gain more user traction and serve multiple users alongside. This suggest the inherent motivation behind the development of online health platforms is not permanent thus, the motivation factors are not necessarily sequential nor predictable but dynamic. This is as a result of the change in demand of the users of the platform as their quest for information online can be associated with the type of information published on the platform. This finding confirms the conclusions of Ye (2014) in a similar study on motivation for the development of the online health platforms where the author asserts that motivation for developing online health platforms is progressive and dynamic. This is confirmed by (Pedroza, Welkener, Lima, Freitas, & Mendes, 2016) in a similar study.

Additionally, extant studies have identified the motivation towards the development of online platforms as largely intrinsic which is linked to datafication. (Mcleod, Hewitt, Gibbs, & Kristof, n.d.; Powell, Ffph, Inglis, Mph, & Ronnie, 2011). This assertion is contrary to the findings of this study. Thus, the two platforms though are driven by intrinsic motivations, envisage to commodification of their platform. Motivation can be both intrinsic and extrinsic (Davis, Bagozzi,

& Warshaw, 1992; Deci & Ryan, 1980) and have multiple paths and influences, e.g. as explicated in the Elaboration Likelihood Model (Petty & Cacioppo, 1986). Leimeister *et al.* (2009) argue that extrinsic motivations are triggered by incentives such as monetary rewards (direct or indirect) or awards. This discussion tends to suggest that:

Finding One: *Several motivational factors drive a developer's mission to developing online health platforms. These motivations are largely intrinsic and extrinsic.*

Further analysis of the findings suggests that the motivation behind the development of Ghana health online was both the developers' motivated by user's preference and need. According to Deci and Ryan (2000) intrinsic motivational factor is linked to datafication where a non – profit health platform aims at improving the health of the population or at increasing the efficiency of the public healthcare service or altruistic or collective self-help reasons, such as a desire to help and learn from those with similar health problems. This result confirms with a study by Bryant *et al.* (2005) which suggested that the motivation is both intrinsic and extrinsic. However, from the findings the initial motivation shifted from intrinsic to extrinsic motivation. The motivational drivers linked to extrinsic motivation are prizes, not necessarily cash-based. The use of the word reward for incentives and prize for extrinsic motivation highlights the fact that incentives are a means used by those who propose collaboration to urge those who must choose to cooperate; the goal of incentives is to generate in the potential contributors some extrinsic motivations that, added to the intrinsic ones, should lead to cooperation. This evident tends suggest that;

Finding Two: *Motivation towards the development of online health platforms is not static thus, shifts from one to the other during the phases of development due to the user preference and need for multiple information.*

6.3.2 Affordances of online health information platform

Furthermore, the analysis of the motivational factors suggests that not every platform has the same motivation thus, the content of the platform also determine the kind of users. Multiple information ranging from health news, feature article, medical information and other auxiliary health and medical information are available to users. It further reveals that consumers/users do not only visit the platform to read health news but, live chat with medical practitioners, sign up for daily health information tips, make enquiries on personal health and medical issues to other. Extant literature on the use of online health information are of the view that every user; medical professional or ordinary user have their intrinsic motivation (Higgins et al., 2011). For instance, according to Klecun et al.(2016), the affordance of online health information platform is relatively inherent and purposive. The intrinsic motivations are defined on the basis of satisfaction in the activity itself rather than external pressures or rewards (Deci & Ryan 2000). So, intrinsically motivated behavior is seen as more spontaneous and self-interested. Intrinsic motivation can be separated into two dimensions: the individual or enjoyment-based intrinsic motivation and the social, or obligation or community-based intrinsic motivation (Lindenberg 2001; Lakhani & Wolf 2005; Von Krogh et al. 2008). Morahan-Martin (2004) further argues that in order to gain traction to online platforms, developers must endeavor to determine the choice user choice and preference through an extensive user preferential analysis.

Finding Three: The use of online health information is diverse and the subjective to the user's health and medical preference and needs.

Strong et al. (2014) claim that outcomes of developer's motivation arise from the aggregation of individual level outcomes. They analyze how individuals perceive and actualize affordance (i.e. what online health platform) enabled them to do or restricted them from doing, and how what they

did might have changed). Based on those accounts and by linking them to developers' goals (such as provide high quality consumer satisfaction) they identify (what they call) 'developer affordances' as emerging from the relation between online health information and the healthcare sector. Thus far, the latent motivation of the developer is thus subjective. This finding is consistent with Ryan & Deci (2000) who maintain that the edge to be motivation is moved to do something unique. Different people are motivated by different factors, which can be categorized into different groups or types of motivation. Additionally, analysis of both cases revealed the latent motivational factors were datafication and commodification. However, the datafication is suggested to be the initial latent theme for both. On the other hand, commodification is seen as a means to sustain the platform through frequent visit and use of the information published. The main distinction is between intrinsic motivations (which refer to actions based on personal interest and pleasure) and extrinsic motivations (which concern actions that lead to a separable result). This assertion is consistent with the finding of this study and is backed by the findings of Pedroza et al. (2016) in a similar study revealing that each motivational factors are triggered by personal motive. This discussion tends to suggest that:

Finding Four: *The findings revealed that in Ghana, infomediaries are more commodification oriented than datafication. It can therefore be inferred that in Ghana, commodification is the main affordance of health infomediaries. The research also found other affordances with health infomediaries in Ghana such as self-aggrandizement, where individuals establishing infomediaries use the medium to promote themselves to society possibly for future roles.*

6.3.3 Challenges of online health information platforms development

The analysis of the challenges related to the development of online health information platforms suggest three main issues namely technical challenges, financial support, and absence of online

health information publication regulations in Ghana. The technical challenges for instance suggest the availability of IT infrastructure such as internet, website hosting servers, maintenance of website, content management and other digital technology competencies built around the IT infrastructure. Thus, having the website is not enough for the sustenance of transmission of health information but the gathering of information, editing of contents, maintenance of the site and the technical competence of team members is very key in the production of timely and quality health and medical information to user. The analysis of both case firms showed that they had competences in their field as health practitioners but fairly knowledgeable in IT. This resulted in the outsourcing of the development of the platform to a developer. Again, the management of the site is also outsourced. In this respect, this finding is in contravention with previous studies, which argue that the development of contents of online health platforms are sacrosanct and should not be handled by personnel with limited knowledge (Gatero, 2011) thus, the management of the website and its content by an external firm posse a challenge to the platform. Hence, this discussion tends to suggest that:

Finding Five: Sustenance of online health information platforms is dependent on the management and the technical handling of the IT infrastructure.

The related analysis suggests that both platforms sustenance is based on the level of financial support to maintaining the site and other related technologies. This finding is in line with previous empirical evidence (Dijck & Poell, 2016). It also shows that managers inability to pay for the services of content managers, hosting and incentive for team members are to a large extent very key to the survival of health information platforms development. Evidence from the analysis reveals that both platforms largely depend on other sources for their information. This requires providing team members with the needed technology and incentive to boost their performance

matching Thus, by adopting strategy to make the platform commercial that is to take care of such recurrent expenditures. This is further confirmed by the findings of Lin & Lin (2018) and Gray (2016). For instance, Ilten (2015) and Willard et al. (2018) in their studies on financing an online health platforms development concluded that platforms could be engage in other commercial activities to generate funds towards meeting their financial obligations. This discussion tends to suggest that:

Finding Six: Since most health infomediaries in Ghana are operated by individuals rather than organizations, they tend to lack managerial, financial or technical competencies of maintaining these platforms.

Regulatory frameworks help guide the implementation of an initiative. From the analysis of the regulatory factors, it was evident that the MOH and the GHS do not have any policy guidelines to support, direct and regulate the activities of online health information providers in Ghana. These policies are aimed at making sure that both the developer and manager of online health platforms produce information devoid of any malpractice and adhere to international best practices. This finding can be lined along that of Edejer (2000) in their study on regulating the development of online health information platforms. This discussion tends to suggest that;

Finding Seven: The operationalization of an online health information platform is influenced by government policies, however, the kind of policies differ based on the legal form of health and medical practices in the country and the nature of operations of the platform.

6.4 Chapter Summary

This chapter analyzed the case findings. It also undertook discussions of the analysis towards answering the research questions some of the seven findings that was revealed includes several motivational factors drives a developer's mission to developing an online health platform, that notwithstanding, these motivations are largely intrinsic and extrinsic. Also, another insight gained from the findings portrayed the use of online health information as diverse and subjective to the user's health and medical preference and needs. Lastly, the findings depicted the ability to resource and maintain the development and management of an online health platforms hinges on the manager's financial capabilities.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Chapter Overview

The previous chapters presented the research background, review of literature, theoretical framework, the methodology, analysis and discussion of findings. This concluding chapter presents a summary of the key findings of the study, discussion on the contribution to research, policy, and practice. The study limitations and recommendations for future research is also presented in this chapter.

7.2 Summary

The study began with the aim to understand the motivation behind the growing development of online health information platforms. Numerous studies on online platforms focuses on consumer's preference and practitioner's perspective. The study focused mainly on the motivational factors behind these health platforms and TACT was employed to unearth these factors.

The study drew on the critical realist case study approach and the technology affordances and constraints theory to investigate the growing trend of online health platforms and further understand the motivations behind them. Based on the findings of the study, this research provided a rich insight into factors that motivate developers of health infomediaries. The study also provided insights on the affordances and constraints of these platforms. In connection with the objectives of the study, the research explained how technology can afford and constrain individual's motivation to carry out an activity. This study explored the motivational factors behind the development of an online health information platform. It also aimed at ascertaining the hidden motivation and

challenges faced by developers of online health information platforms. Thus far, the following objectives were formulated for the research as to:

1. Identify motivational factors behind health infomediaries.
2. Ascertain any latent affordances of health infomediaries.
3. Discover the challenges faced by developers of health infomediaries.

In addressing these objectives, TACT was adopted as the theoretical guiding lens for the study. TACT was chosen because it presents an opportunity for individuals to understand why a technology was adopted and use (Klecun et al., 2016). Again, the choice of the TACT was as a result of its ability to investigate consequences of using a technology by an individual or organization (Volkoff & Strong, 2014). This makes TACT best fit for this study in identifying the latent motivation and constraints in the development of an online health information platforms.

To understand the latent affordances and constraints for the development of an online health information platforms, TACT was extended to include other dimensions such as intention for the affordance dimension and regulatory for the consequences dimension. A case study approach was chosen after an extensive review of literature and also employed a semi-structured interview with the founders of the two selected online health information platforms. Following the data collection method was the presentation of findings which was then analysed and discussed in chapter six in relation to the research questions in-line with the research frameworks and synthesised with literature. In chapter six, the analysis of the findings led to seven findings. These findings are mapped to each research question and respective contribution to research and practice in the sections that follow.

7.3 Mapping Research Questions to Findings and Contributions

This section seeks to map the research questions to the research findings and the contribution to practice and research. The findings of the study are presented in three folds: first, the findings on the motivational factors exploring what factors trigger the development of health infomediaries, second, the finding on the hidden affordances of heath infomediaries and third, the findings on the constrained faced by health infomediaries. Below is the summary of the research findings followed by a table that maps the research questions to the findings and contribution.

7.3.1 The Motivational factors behind health infomediaries

The analysis and discussion on the motivational factors unearthed two findings. The findings revealed that several motivational factors drive a developer's mission to developing an online health platform, that notwithstanding, these motivations are largely intrinsic and extrinsic. Further the analysis of the findings indicates these factors are not statistic. Thus, these motivational factors change along with the development phases of the platform in order to achieve their intended mission and vision. This finding suggests the inherent motivation behind the development of online health platform is not necessarily sequential nor predictable but dynamic due to the changing demand of users.

7.3.2 The affordances of health infomediaries

The second research objective was to identify the latent affordances of health infomediaries. This led to the findings from the analysis. The findings revealed that the use of online health information is diverse and is subjective of the user's health and medical preference or needs. This finding suggests every platform has its intended users. The intended users, thus shape the content

published on the platform. Multiple information ranging from health news, feature article, medical information and other auxiliary health and medical information are available to users. This finding further indicated that the latent motivation of the developer is largely inherent and is manifested by the kind of information needed by users. Thus, the development of online health information platform is relatively purposive. Again, findings suggest that in order to gain traction to an online platform, developers must endeavor to determine the users' choice and preference through an extensive user preferential analysis. Based on analysis, the findings further indicated that the latent affordances of online health information platforms in respect of their vision and mission are mainly datafication and commodification. The research also found other affordances with health infomediaries in Ghana such as self-aggrandizement, where individuals establishing infomediaries use the medium to promote themselves to society possibly for future roles. Datafication was identified to be an initial motive followed by commodification. In Ghana, infomediaries are more commodification oriented than datafication. In this case study, no evidence was found of infomediaries in Ghana, purposively collecting user data to provide better services or sell the data to other interest parties. Rather, health infomediaries in Ghana apart from providing health information, also advertise and sell health products to consumers. One significant finding was that, some infomediaries even advertise non-health products. Datafication employs collective tools, technologies and processes to 'data mine' user data with a view to serving them better through content tailoring. Commodification on the other hand, refers to the way in which user data is transformed into monetary value.

7.3.3 Constraints of health infomediaries

The third research objective was to discover the challenges faced by developers of online health information platforms. Three findings were discovered after the analysis of the findings. The findings revealed that developers face three main constraints namely technical, financial and regulatory. In respect of the technical challenges, finding revealed the sustenance of online health information platforms is dependent on the management and the technical handling of the IT infrastructure. Thus, the ability of the team to be able to manage all the technical infrastructure without much challenge. IT infrastructure such as internet, website hosting servers, maintenance of website, content management and other digital technology competencies comes with some level of challenges. This finding suggests having the website is not enough guarantee for its sustenance however, the ability to gather information, edit contents, maintenance of the site and the technical competence of team members is very critical to the production of timely and quality health and medical information to user.

Further the findings indicated that the ability to resource and maintain the development and management of an online health platforms hinges on the founder's financial capabilities. As revealed, both firms have outsourced most of their services to external agencies. Services such as hosting of site and its maintenance comes with an associated cost to the firm. This suggests that manager's inability to pay for the services of content managers, hosting and incentive for team members would to a large extent affect the smooth operations of the platform.

Another key finding was the lack of regulatory frameworks to help guide the publication of online health information platforms. The unavailability of a legal framework challenges the type of

contents published on online health platforms as content producers are not guided by any standards towards publishing content of high value. This has the ability to compromise the principle of integrity in publication of some content which may be sensitive to the user's viewership. Legal and regulatory policies are aimed at making sure that developer and manager of online health platforms produce information devoid of any malpractice and adhere to international best practices. Arguably, it can be deduced that, the existence of an online health information platform is influenced by government policies.

Table 7.1: Mapping Research Questions to Findings and Contribution

Research Question	**Related Research Gaps**	**Matching Findings**	**Contribution to Research and Practice**
Motivation behind the online platform development			
What are the motivational factors behind the health infomediaries? *What are the latent affordances of health infomediaries?*	*Need to understand the motivation behind health infomediaries* (Ye, 2014) *need to investigate the latent affordances of health infomediaries* (Pedroza et al., 2016)	***Finding One*** *Several motivational factors drive a developer's mission to developing an online health platform, that notwithstanding, these motivations are largely intrinsic and extrinsic.* ***Finding Two*** *Motivation towards the development of an online health platform is not static thus, shifts from one to the other during the phases of development due to the user preference and need for multiple information.* ***Finding Three*** *The use of online health information is diverse and the subjective to the user's health and medical preference and needs.* ***Finding Four*** *The findings revealed that in Ghana, infomediaries are more commodification oriented than datafication. It can therefore be inferred that in Ghana, commodification is the main affordance of health infomediaries.*	*The study offered a considerable understanding to the motivational factors behind the development of health infomediaries.* *This understanding, especially from the lens of TACT assisted in understanding the affordances of the development of health infomediaries.* *The study is arguably the first to identify the latent motivations behind the development of health infomediaries in developing economies.*

Developers Constraints in the developing online health platforms			
What are the challenges faced by health infomediaries?	*Need to investigate factors that challenge health infomediaries* (V. Dijck & Poell, 2016)	***Finding Five*** *Survival and sustenance of online health information platforms is dependent on the management and the technical handling of the IT infrastructure.* ***Finding Six*** *The ability to resource and maintain the development and management of an online health platforms hinges on the manager's financial capabilities.* ***Finding Seven*** *The survival of an online health information platform is influenced by government policies, however, the kind of policies differ based on the legal form of health and medical practices in the country and the nature of operations of the platform.*	*The study is among the few that used TACT to identify and also understand the challenges faced by developers when developing online health platforms. These factors may be similar to the development of other platforms, these findings however were identified to be specifically identified with online health information platforms.*

***Source**: Author's construct*

7.4 Implication for Research, Practice and Policy

In the aspect of research, policy and practice, the study has contributed significantly. This sub-section explains it in detail.

7.4.1 Implication for Research

With regards to research, this study contributes to the body of knowledge on the emergence of online health platforms by exploring the motivation behind the development of these platforms which had received little attention. Based on the findings of the study, there is the need for IS researchers to extend their studies in online health beyond online health information seekers who concentrates on the web content and focus on the regulation on online health information which arguably plays a vital role in online health platforms today. The implication for research is that health infomediaries work effectively in a developing economy when it meets the requirements of their consumers. As such, researchers should study their target audience and deliver their services to align with their consumer's interest. Moreover, the study explains that an individual is likely to develop an online health information platform irrespective of the challenges that constrains it.

In addition, TACT also revealed that inasmuch as the application of technology enable users to perform their activities in real time, there are some pitfalls or constraints that users encounter with technology adoption. TACT posits that technology can also constrain either the users or developers from achieving their objectives. More so, the study revealed that it is possible to develop online health platform if the individual or the organization is being motivated either intrinsically or extrinsically. TACT enabled the researcher to understand how online health consumers in a developing economy opts for a locally developed online health information platform because it

elaborated on what they need to know about their health. However, TACT has it weakness in studying the 'how' aspect of phenomenon; hence researchers who are studying a process-based approach should be careful in selecting TACT as a theoretical lens. Therefore, there should be an aspect of the theory that enables researchers to study a process-based phenomenon.

7.4.2 Implication for Practice

Moreover, in terms of the research's implication to practice, this study serves as a guidance for individuals or organizations that would want to develop an online health information platform. The study revealed that various stakeholders like the technical team and users play vital role in the development of online health platform.

Practitioners should note that the decision to develop health infomediary does not only stem from the individual's motivation, however, their consumers play a key role in it. Moreover, practitioners should note that though platforms are web-based, it is not automatic that it would be available to users irrespective of where they are. Because for fear of system downtimes, some of these platforms put in place some restrictions. Therefore, researchers should not generalize and assume that all online health platforms can be access by consumers all the time.

7.4.3 Implication for Policy

With regards to policy, there is the need for the developing countries to adequately analyze both national and international legal frameworks that have implications on the use of online platforms and social media. This will enlighten developing countries to be aware of laws that influence the use of these platform and as well verify if there is the need for additional laws to support the use of these platforms.

In addition, policy makers should in the near future consider how to handle health infomediaries and the change it brings about in a developing economy. The study advocates for government to institute very effective policies and guidelines and ensure its compliance to achieve an effective publication and use of online health information and development of health infomediaries.

7.5 Limitations and Future Research Directions

Though the study has offered rich insights, provided implications for policy, research and practice, there are some limitations with the study. These limitations can however be a direction for further research by researchers and practitioners in the IS and other related disciplines. The study sought to understand the motivations behind the development of online health information platforms. The case institutions were from the health sector, the findings cannot be generalized to other sectors and industries because they operate on different business models and structures. Moreover, due to contextual diversities, researchers might be restricted to generalizing the findings to other contexts. Additionally, future studies can review the effectiveness of online health information platform to ascertain how it enables or constraints its use. Other theories can also be used in future research to unearth other pertinent issues related to the motivation and use of online health platforms and to offer more generalizations to the findings of the study.

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APPENDIX A – INTERVIEW GUIDE

DEPARTMENT OF MANAGEMENT INFORMATION SYSTEMS

Dear Respondent,

The bearer of this questionnaire is a student of the University of Ghana Business School pursuing **MPhil MIS**. He is conducting a study on **"UNDERSTANDING THE MOTIVATION BEHIND THE GROWING DEVELOPMENT OF ONLINE HEALTH INFORMATION PLATFORMS IN DEVELOPING ECONOMIES".** Please kindly respond to the following questions for the student. Your responses will be duly appreciated and treated with utmost confidentiality.

PART A (***The following questions seek to investigate the motivational factors that causes the development of Online Health Information Platforms)***

1. When was the Online Health Information Platform launched?
2. What triggered the need to develop the Online Health Information Platform?
3. What was the expectation/goal for developing an Online Health Information Platform?
4. Have those expectation been met?

- If yes, which ones have been met or have not been met?

5. Was there an existing initiative as part of your company's structure or it was an entirely new initiative from your own intuition?

- If yes, what informed your decision to develop an Online Health Information Platform?

PART B ***(The following questions seek to investigate any latent motivational factors of online health information platforms)***

1. What are the processes involved in the supply of information to these sites?
2. What are the measures in place to ensure information put on the site are of quality and genuine source?
3. How often do users visit the site? (no. of daily visit, daily download, number of uploads, etc.)
4. Which category of users does the project seek to serve?
5. Do users personally use the feedback session through personal or mail contact on the web portal?
6. How user friendly is the OHIP?
7. Is there the need for any special training for users?

PART C ***(The following questions seeks to discover challenges faced by developers of online health information platforms)***

1. What legal framework underpins the development of Online Health Information Platform?
2. Is there any policy guideline on the development of OHIP?

- If yes, is it being pursued?

- If no, why is there no a blueprint?

3. Are the publishing standards to support OHIP?

4. How do you provide adequate budgetary support for this project?

APPENDIX B – REVIEW OF RELATED LITERATURE

Authors	Research Title	Purpose/Focus	Underpinning Theory or Framework	Research Method and Country
Li, Wang, Lin, & Hajli, (2018)	Seeking and sharing health information on social media: A net valence model and cross-cultural comparison	factors affecting users' intention to seek and share health information on social media	Social Support Theory (Net Valence Model)	Quantitative USA
(Adams, 2010)	Revisiting the online health information reliability debate in the wake of "web 2.0": An inter-disciplinary literature and website review	to explore renewed concerns about the reliability of online health information in light of the increasing popularity of web applications that enable more end-user-generated content ("web 2.0").	Conceptual Framework	Qualitative Netherlands
(Xiao et al., 2014)	Factors influencing online health information search: An empirical analysis of a national cancer-related survey	examines the impacts of IT enablers and health motivators on peoples' online health information search behavior	Information foraging theory Conceptual framework	Quantitative USA
(Cotten & Gupta, 2004)	Characteristics of online and offline health information seekers and factors that discriminate between them	the purpose of this study is to examine how individual characteristics, health status, and computer and Internet usage affect health information seeking among a sample of United States adults.	Conceptual framework	Quantitative USA

(N. J. Gray et al., 2005)	**Health information-seeking behavior in adolescence: the place of the internet**	**This paper seeks to explore United Kingdom (UK) and United States (US) adolescents' perceptions and experiences of using the internet to find information about health and medicines, in the context of the other health information sources that are available to them.**	**Conceptual framework**	**Quantitative UK**
(Sillence et al., 2007)	**How do patients evaluate and make use of online health information?**		**Conceptual framework**	**Quantitative UK**
(Zhao, 2009)	**Parental education and children's online health information seeking: Beyond the digital divide debate**	**This study examines the relationship between parental education and children's online health information seeking in the context of the on-going digital divide debate**	**Conceptual framework**	**Quantitative USA**
(Anker et al., 2011)	**Health information seeking: A review of measures and methods**		**Conceptual framework**	**Mixed Methods USA**
(Rains & Karmikel, 2009)	**Health information-seeking and perceptions of website credibility: Examining Web-use orientation, message characteristics, and structural features of websites**		**Conceptual framework**	**Qualitative USA**

(Manafo & Wong, 2012)	Exploring Older Adults' Health Information Seeking Behaviors	To explore older adults' health seeking behavior	Grounded theory	Qualitative Canada
(Miller & Bell, 2012)	Online Health Information Seeking: The Influence of Age, Information Trustworthiness, and Search Challenges	to examine age differences in the role of trust and ease of search in predicting whether or not individuals use (adopters) or do not use (non adopters) the Internet to search for health information	Technology Acceptance Model	Quantitative USA
(Caiata-zufferey et al., 2010)	Online Health Information Seeking in the Context of the Medical Consultation in Switzerland		Grounded Theory	Qualitative Switzerland
(Liebert et al., 2004)	How Internet Users Find, Evaluate, and Use Online Health Information: A Cross-Cultural Review			Qualitative USA
(Leung & Ph, 2008)	Internet Embeddedness: Links with Online Health Information Seeking, Expectancy Value/Quality of Health Information Websites, and Internet Usage	study examines how Internet users search the Web for important information, especially health or medical information, to make critical decisions, and the perception of how intimately our lives are embedded in the Internet intersects with patterns of health information seeking online and the expected	Conceptual framework	Quantitative Hong Kong

	Patterns	quality of health information websites.		
(Hesse et al., 2005)	The Impact of the Internet and Its Implications for Health Care Providers: Findings From the First Health Information National Trends Survey	to provide national representative estimates for health-related uses of the Internet, level of trust in health information sources, and preferences for cancer information sources.	Conceptual framework	Quantitative USA
(Berland et al., 2013)	Health information on the internet: Accessibility, Quality, and Readability in English and Spanish	To evaluate health information on breast cancer, depression through English and Spanish language search engines and web sites.		Quantitative USA
Li, Wang, Lin, & Hajli, (2018)	Seeking and sharing health information on social media: A net valence model and cross-cultural comparison	factors affecting users' intention to seek and share health information on social media	Social Support Theory (Net Valence Model)	Quantitative USA
Huh, Yetisgen-Yildiz, & Pratt, (2013)	Text classification for assisting moderators in online health communities			
(Adams, 2010)	Revisiting the online health information reliability debate in the wake of "web 2.0": An inter-disciplinary literature and website review	to explore renewed concerns about the reliability of online health information in light of the increasing popularity of web applications that enable more end-user-generated content ("web 2.0").	Conceptual Framework	Qualitative Netherlands
(Xiao et al., 2014)	Factors influencing online health information	examines the impacts of IT enablers and health motivators on	Information foraging	Quantitative

	search: An empirical analysis of a national cancer-related survey	peoples' online health information search behavior	theory Conceptual framework	USA
(Cotten & Gupta, 2004)	Characteristics of online and offline health information seekers and factors that discriminate between them	the purpose of this study is to examine how individual characteristics, health status, and computer and Internet usage affect health information seeking among a sample of United States adults.	Conceptual framework	Quantitative USA
(N. J. Gray et al., 2005)	Health information-seeking behavior in adolescence: the place of the internet	This paper seeks to explore United Kingdom (UK) and United States (US) adolescents' perceptions and experiences of using the internet to find information about health and medicines, in the context of the other health information sources that are available to them.	Conceptual framework	Quantitative UK
(Sillence et al., 2007)	How do patients evaluate and make use of online health information?		Conceptual framework	Quantitative UK
(Zhao, 2009)	Parental education and children's online health information seeking: Beyond the digital divide debate	This study examines the relationship between parental education and children's online health information seeking in the context of the on-	Conceptual framework	Quantitative USA

		going digital divide debate		
(Anker et al., 2011)	Health information seeking: A review of measures and methods		Conceptual framework	Mixed Methods USA
(Rains & Karmikel, 2009)	Health information-seeking and perceptions of website credibility: Examining Web-use orientation, message characteristics, and structural features of websites		Conceptual framework	Qualitative USA
(Manafo & Wong, 2012)	Exploring Older Adults' Health Information Seeking Behaviors	To explore older adults' health seeking behavior	Grounded theory	Qualitative Canada
(Miller & Bell, 2012)	Online Health Information Seeking: The Influence of Age, Information Trustworthiness, and Search Challenges	to examine age differences in the role of trust and ease of search in predicting whether or not individuals use (adopters) or do not use (non adopters) the Internet to search for health information	Technology Acceptance Model	Quantitative USA
(Caiata-zufferey et al., 2010)	Online Health Information Seeking in the Context of the Medical Consultation in Switzerland		Grounded Theory	Qualitative Switzerland
(Liebert et al., 2004)	How Internet Users Find, Evaluate, and Use			Qualitative

	Online Health Information: A Cross-Cultural Review			USA
(Leung & Ph, 2008)	Internet Embeddedness: Links with Online Health Information Seeking, Expectancy Value/Quality of Health Information Websites, and Internet Usage Patterns	study examines how Internet users search the Web for important information, especially health or medical information, to make critical decisions, and the perception of how intimately our lives are embedded in the Internet intersects with patterns of health information seeking online and the expected quality of health information websites.	Conceptual framework	Quantitative Hong Kong
(Hesse et al., 2005)	The Impact of the Internet and Its Implications for Health Care Providers: Findings From the First Health Information National Trends Survey	to provide national representative estimates for health-related uses of the Internet, level of trust in health information sources, and preferences for cancer information sources.	Conceptual framework	Quantitative USA
(Berland et al., 2013)	Health information on the internet: Accessibility, Quality, and Readability in English and Spanish	To evaluate health information on breast cancer, depression through English and Spanish language search engines and web sites.		Quantitative USA