

THESIS PROPOSAL SEMINAR



For the Greater Glory of God

Identifying and Modeling Factors Impacting Online Healthcare Communities in India

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1. Introduction:

Health is not only being the absence of disease or infirmity but the presence of complete physical, mental and social well-being (WHO, 1948). Progressive usage of technology with the evolution of web 2.0 is leading this vision of World Health Organization (WHO) to become reality. With the help of social media, present approach of healthcare practices has modified into more interactive and effective having assistance of homogenous people and health experts worldwide. These interactive platforms are named differently in different provinces, however, the core functionalities and purpose remain same for all. Few such names are Online Healthcare Communities (OHC), Online Social Networks (OSN), Virtual Community of Practice (VCoP), etc. For the convenience of understanding, I will be using Online Healthcare Communities (OHC) throughout my study.

Considering this vital role and present trend of Internet technologies including social media, the structure of this study is developed. Since from the initiation of research, I was interested in healthcare domain and was looking to explore the opportunities in this domain embedded with a futuristic aspect. My professional endeavor as an IT Business Analyst has enabled me to experiment and understand the dynamic nature of any IT application and look for the additional developments which can be beneficiary for both service provider and service receiver. Therefore, to accomplish my interest in healthcare with the futuristic approach of an IT system user, I have decided to explore the dynamics and possibilities of online communities in Indian healthcare industry.

The remaining of this article will be as follows: In the next section, various important aspects related to OHC activities like care process, stakeholders, the role of ICT, information credibility and factors impacting OHC are discussed in detail. This section will justify our decision to study the online community aspects in healthcare. In the following section research gap is explained with respect to the existing literature in the study area and how it is leading to the research questions is shown following with research objectives and theoretical framework. The next section will explain the research design and methodologies, which I want to perform in my research. The final section will discuss the expected outcome from this study.

2. Literature Review:

An online community is a group of people with common interest or shared purpose whose interactions are governed by policies in the form of tacit assumptions, rituals, protocols, rules, and regulations and by use of computer systems with Internet to support and mediate social interaction and facilitate a sense of togetherness (Maloney-Krichmar & Preece, 2005, Preece 2000). Healthcare Communities are emerging as a collection of individuals who have common healthcare interests (Song, Jiang, Yan, & Chen, 2014). OHC are Internet-based discussion platforms where users can read, contribute or reply to any health-related conversation using Internet features. Here patients can discuss various disease related issues and their effects. They also talk about the quality of services delivered by any service provider and rate the performances of those services as per their experience. People also seek expert opinions about any health criticality on these platforms. Seeing all these diversified functionalities of OHC, Hajli has said that the Internet has empowered patients to share their experiences and suggestions and also to gain access to others' information using online discussion forums (Hajli, 2014). In healthcare online community context where improving health condition is the central concern, patients are motivated to find others who have experienced or are suffering from similar health problems (Song, X et al. 2014).

Remaining up-to-date and delivering best evidence-based care is crucial for health professionals. They need to be lifelong learners as medical information grows and changes quickly. Online Community assumes a critical part in supporting the Continual Process Development of healthcare professionals as it permits them to remain updated and proficient of the present literature; it has been progressively utilized for gaining from specialists, sharing medical information, examining operational administration challenges and clinical issues (Li et al. 2014). Studies in health research uncover that OHC potentially support and boost healthcare teams that may not normally work together might use online interaction to collaborate in order to share, debate, resolve, incorporate and implement different assessments in practice to improve and inform evidence-based judgment making (Ikiyoda et al. 2013). This collaborative approach helps all the service providers to deliver effective service and acquire maximum customer satisfaction.

Healthcare is a very dynamic domain where all the stakeholders can be associated with multiple substances. It is very situation oriented and difficult to automate processes like other domains. Unlike most of the Internet services in several industries, the online service delivery channel in healthcare can't depend completely on standardizing service mechanisms. Thus, there is a limited self-service path in the healthcare sector. Healthcare is the largest service sector in many economies across the globe, but it lags behind other domains in the use of efficient and innovative approaches to both patient care and service organization (Jung & Padman, 2015). This has motivated my research in this context to explore and analyze why healthcare is lacking in this aspect at this stage of high technological and social environment. To proceed with this mission, I have investigated the available literature relating this healthcare-Internet junction and tried to find out the shortcomings in the Indian context as to understand why healthcare has to improve more in this regard.

Social support is a vital attribute in treatment and wellness of a patient. The operational concepts of OHC stand on the pillars of social support. According to the research findings of Isa et al. (2016) social support has a direct impact on the fruitful result of the treatment process. He also explained Social support can be provided informally such as by family, friends, neighbors and the wider community, and formally such as by professionals and agencies. The literature on social support suggests that OHC mainly features three types of social support: informational support, emotional support and companionship (network support) (Bambina, 2007 and Keating, 2013). *Informational support* is the communication of information, suggestion or guidance to the community users (Krause, 1986). The content of such a post in an OHC is usually related to advice, recommendations, awareness and personal experience related to particular disease or health problem. Examples can be side effects of a drug, ways to deal with a symptom, experience during a consultation or issues in medical insurance. *The emotional support* comprises of the empathetic ability of a situation, encouragement, affection, supporting, validation, kindness, caring, and worry, etc. Such supports can help one reduce the levels of stress or anxiety. Companionship or network support consists of chatting, humor, teasing as well as discussions activities and events outside to one's health problems. This helps a patient to stay stable and socially active. Examples include sharing jokes, regional festivals, birthday wishes, holiday plans, or online scrabble games (Wang, Zhao, & Street, 2014). Since an important aspect in OHC, social connectivity also has a strong role in leading me towards my research gap to study its relevance in present conditions.

Along with benefits for patients, there are also findings that show the service provider being benefited by the OHC (Hajli, 2014). The service provider can evaluate the feedbacks provided by experienced patients and use their inputs for the betterment of their services. Chua and Banerjee (2013) have found that online communities have transformed participants from passive content readers into an active content contributor, thereby establishing their role more significant for the business of the service provider. Patients are deciding clearly about where they receive efficient treatment based on their experiences; therefore it is vital for healthcare service providers to create an institutional framework to sense and respond empathetically (Almunawar et al. 2012). Hospitals need to understand the impact of this online information-seeking attitude of patients and modify their services accordingly to achieve greater brand value. According to the research findings by Panchapakesan, Sai and Rajendran (2015), service providers should continuously improve the quality of their services and then encourage positive word-of-mouth communications through better assistance to patients and their attendants. Hospitals are transforming from treatment centers to centers for health promotion and disease prevention (Jang, Kim, & Lee, 2016). Programs should be designed by involving caregivers and patient's attendants to help in enhancing the sense of self-perception such as self-efficacy and self-esteem, educating positive coping strategies, and building social support networks (Isa et al. 2016). Healthcare service providers should implement these practices in the day-to-day operation and take necessary actions to grow and get higher customer satisfaction. I have tried to evaluate this factor closely and use the existing information to come out with robust recommendations for service providers that will help them to achieve higher customer satisfaction.

Healthcare service is an alignment of widely spread activities with the association of multiple users at the different level of its operation. Transforming health service delivery via internet technology is a complicated process not only because it involves many stakeholders such as end users (providers, patients), payers, hospital staff, system administrator, and technicians but also due to nature of the task performed in the system, which is information intensive, situation specific, and must be embedded in the acceptable workflow (Jung & Padman, 2015). Few important stakeholders as per the scope of this study are doctors, patients, patient's attendance, Nurses, Technicians, policy makers, online application developers and system admin.

Doctors or physicians are the backbones of care service. The interaction between doctor and patient always carry the maximum importance in the treatment process. Mutually they execute the consultation process for delivering the core objective of the care service. Online consultation can offer to connect doctors and other health specialists with their patients virtually removing location, time and cost barriers, resulting physicians delivering care over the Internet without even meeting their patients physically (Janet, 2009). Applications of online health information have brought changes to the behavior of actors associated in a healthcare practice. Patients become motivated to understand more of their symptoms from available online sources before meeting a physician (Osei-Frimpong, Wilson, & Lemke, 2016). An educated patient is able to take active participation in the consultation process and feel free to give a suggestion for his treatment. The doctor now has a better patient as the patient realizes the process and is involved and is willing to comply with the treatment modalities that he has jointly developed with the doctor (Prahalad & Ramaswamy, 2004). It is also suggested that doctors should participate actively in such forums to guide the patients properly and restrain them from making any wrong assumption (Almunawar, Wint, Low, & Anshari, 2012). Service providers should encourage doctors to participate in online discussions by assigning incentives to participate, largely through compensation for their services, as well as provide better care (Tang, Black & Young, 2006). Research has also indicated that women are more inclined towards such activities of using online platform for their health related queries than men as they take active participation in OHC to look up online health information, seek medical advice and request prescription refills from their service providers (Cohen & Stussman 2010, Jung & Padman, 2014).

An attendant (Caregiver) is someone who provides practical, daily voluntary support for a person unable to execute all of the daily living activities due to some health related limitation (Savage & Bailey, 2004). The role of an attendant is very demanding and associate closely with the treatment of his patient especially in Indian context due to our cultural practices. The attendant has a major stake in the treatment decisions making the process by a patient in India (Padma, Rajendran, and Sai, 2010). Even on many occasions, the attendant has to take the call for a sudden treatment decision, as the patient is not in a state for this. The attendants also use OHC for gathering information about the health situation of his patient. Some researchers have found that the treatment process can have a direct impact on the attendants resulting an increase of stress. Therefore, it is the

responsibility of service provider to be empathetic with the attendants and assist them when they need.

Clinicians must make themselves more available to the attendant of the patient and take on responsibility for solving the hindrances faced by them (Stensrud, Høyer, Granerud, & Landheim, 2015).

Nurses are an integral part of the treatment process who is very closely associated with all other important stakeholders of the hospital. As per their research in Libya Baalbaki, Ahmed, Pashtenko, & Makarem (2008) found that nursing was the most influential aspect with respect to patient satisfaction. Nurses provide the majority of direct care and are fundamental for shaping and providing quality care (Sadeghi-Bazargani, Tabrizi, Saadati, Hassanzadeh, & Alizadeh, 2015). There is one website www.nurserecommended.com where the nurses can refer their friends, relatives and patients a doctor who will be best for their sickness. Technicians and support staffs are an integral part of the healthcare industry who has vital contributions in treatment process at different stages. In the laboratory, a highly skilled team of pathologists and medical technologists, technicians and specialist work together to solve the mysteries, put the puzzles together, and answer the critical questions of medicine. The job of a technician is rigid as they deal with mechanical instruments like analyzer, microscope, thyroid machine, centrifuge, syringe, acid and also various chemicals that have certain kind of danger associated with it (Ghaddar, et al. 2013). These high demanding job situations can bring stress in the life of technicians, which could affect the treatment quality if not addressed actively and result in the diminishing quality of patient care (Lua & Imilia, 2011).

All above discussed stakeholders and parameters we will consider in our study and try to evaluate their role and importance within an OHC context. Doctor, Patient, Patient's Attendant and Hospital Support Staff (Nurse and Technician) do pay noticeable contribution in care practice and also associated with OHC. This study will consider all their presences and try to evaluate the future possibilities, which can be resulted when any of these stakeholders change in any way. Ultimately the research findings will surely benefit multiple stakeholders.

With the evolution of ICT (Information and Communication Technology) in the healthcare industry, the role of actors in healthcare has become more dynamic and participatory. Nowadays, customers in healthcare are

actively seeking health information and using it to make decisions about their treatment (Almunawar et al. 2012). Customers are now more educated and informed about their situation through different online discussion forums. Technology has the potential to be an experience-enriching and value-creating component in this one-to-one setting (Osei-Frimpong et al. 2016). IT systems are vital to healthcare delivery and have a tremendous potential to bring about an overall improvement as per the changing needs for patient care and safety (Ammenwerth and Rigby 2016). Most modernizations in the healthcare industry in the recent time have focused on digitization with computing, communication, and decision technologies, particularly Internet technologies. Using Internet technologies, health service providers can reach patients who, otherwise, would likely not have care facility without the technology, and therefore it has a potential to generate a new market for underserved populations (Jung & Padman, 2015). There is huge scope for healthcare industry with the use of Internet technologies. The online health consultation is a growing trend and if organized smartly, it has the potential to substitute clinical visits for non-urgent, acute symptoms at almost zero cost (Adamson and Bachman 2010). With concepts of digital health empowered with IT are leading the innovation, a user-friendly IT system is very important for the success of healthcare business. A user interface (UI) is the space, where communication between humans and systems occurs. The interface allows a user to manipulate the system (input) and displays the effects of the user's manipulation (output) (Kumar, Maskara, R., Maskara, S., & Chiang, 2014). Surely health systems with incompetent and inadequate user interfaces increase cognitive load resulting clinicians to commit errors. On the contrary, a bad IT system creates difficulties for the end user to use the system resulting in user dissatisfaction. Therefore designing a compatible and responsive health system is very crucial for the healthcare business. Ammenwerth and Rigby (2016) suggested three ways of healthcare information system design in their book 'Evidence-based health informatics: Promoting safety and efficiency through scientific methods and ethical policy': User-centered design, Co-operative design, and User-driven innovation. The user-centered design is the process to understand users' need and design for these needs. The *cooperative design approach* is the method of recognition of work activity by different users. This can be complex sometimes due to the involvement of human activities for coordination and cooperation among many individuals with different areas of expertise. *User-driven innovation* is a participatory design process where the basic idea is to engage the users to innovate and develop products themselves (Kushniruk & Nøhr, 2016). This user-driven approach is the most used and accepted among the stakeholders at present. There will be few

barriers, which can hinder the benefits of online communities. Information overload is one of these issues that can be a difficulty a user can have in comprehending issues and making judgments that are influenced by the presence of too much information (Kumar & Maskara, 2015). According to Jung and Padman (2015), the key barriers for patients to adopt online medical services can be summarized into a few important issues—accessibility to Internet, concerns about content privacy, trust, and perceptions of care quality. EHR (Electronic Health Record) is a sophisticated process of managing health records of patients that contribute to reduced costs of services due to removal of redundancy and less paperwork involved, allow hospitals to maintain confidentiality of information of their patients by making the data accessible to limited personnel and reducing the consultation and treatment time of patients. Healthcare is entering the digital age aided via the wide-spread deployment of Electronic Medical Records (EMR), availability of Personal Health Record (PHR) systems, Decision Support Systems, and other healthcare information, communication, and decision technologies (Jung and Padman, 2015). This, as a result, will enable users to activate self-service healthcare management electronically, such as checking their own medical records, exploring further details on the related topic, making/modifying appointments, requesting prescription renewals, and communicating with clinicians with minimal disruption (Jung, Padman, Paone and Shevchik, 2011). All this information regarding the role of digital practices in healthcare domain is very vital for my study. I will be evaluating the above ICT aspects in an OHC settings and also try to explore it comparing the affectability of above said barriers. Subsequently, the study will address the key ICT activities in OHC and the part of different barriers in that which can cause difficulties to a user or a stakeholder.

This is a very crucial aspect of information available on online communities, which talks about multifaceted possibilities within the existence of an online community. Credibility is the believability and trustworthiness of information displayed for usage. Health communities' credibility is an important factor for users as they make a continuous assessment about the quality of information provided in online contexts (Rains & Karmikel, 2009). Trustworthy and useful information is the most anticipated aspect of an OHC. The healthcare industry is experiencing multifaceted shifts, from hospital-centered to patient-centered care, and from traditional face-to-face care to advanced technology enabled systems such as e-health, mobile health (m-health), and ubiquitous health (u-health) environments that collect patient information in real time (Jung &

Padman, 2015). This definitely brings the need for a system to analyze and obtain faithful, valid and adequate information available on OHC. Health application's credibility takes place within the larger context of trust and is an essential part of OHC (Hajli et al. 2015). Social media are shaping the societal information systems, which in turn are facilitating social relationships of individuals to add value by contributing their existing knowledge and experience with others in the community. If participants will be provided with some tools to evaluate the accurateness of content in OHC, they will be more confident to use or follow the recommendations provided here (Jung & Padman, 2015). To assist this concern some online communities provide user profiles, offering background information of system users or encourage individuals to rate the information generated by others, keep certain identifiable practices before one can contribute to establishing a level of trust in the community (Smith, Menon, & Sivakumar, 2005). These strategies support online communities to develop their credibility in the social environment, with a view to attracting more individuals to participate.

Facilitator or moderator has a very vital role to ensure the credibility of information in an OHC and keep the information sharing activity run unanimously in a large group online association, which is a comparatively new phenomenon. Fostering active participation is one of the most difficult, yet central jobs for online facilitators (Herie, 2004). A moderator in an online community is a person whose basic job is to keep the forum active and maintain its functionalities by keeping the hazardous things away. Facilitators should attempt to read all the posted messages in the forums to maintain credibility and answer questions when necessary (when members of the community have not responded or the question is directed to the facilitator) (O'Grady et al. 2013). When participants take the time to share a painful or difficult personal experience, the facilitator should acknowledge, validate and appreciate their message with compassionate statements (Knowles, Holton, and Swanson, 2005). According to O'Grady et al. (2013) the moderator has two important tasks to be done in an OHC, promoting and maintaining participation. Under promoting participants, he needs to welcome new participants, thanks participants for sharing personal stories, asks questions to help enable collaboration, etc. In maintaining participants, the moderator needs to redirect or create a new thread for off-topic messages, promote collaboration by encouraging participants to share, acknowledge that all viewpoints are valid, support goals of the participants by acknowledging their requests, acknowledge, validate and appreciate message postings, provide members with opportunities to act as facilitators and so on.

To come out with a thriving and successful online community, organizations must ensure they have the requisite commitment and the financial and human resources not only to start an online community but also to support its evolution throughout its life cycle (Young, 2013). As people increasingly turn to OHC for information and support, it is vital to realize the importance of community management at different stages of the community. Throughout the life of the community, new members join in and old members whose needs are satisfied or whose initial anticipation for joining the community goes down leave the community. As and when new members join, the community evolves and a cycle of interaction repeats (Iriberry and Leroy 2009). They also have documented five distinctive phases that online communities evolve through distinctive life cycle stages namely: inception, creation, growth, maturity, and, sustainability or death. At the inception stage, the idea for an online community emerges to satisfy a need for information, support, regeneration, and relationship. Some communities emerge when a small group of people with a similar concern interacts online, while others are born when a business organization provides a platform for interaction. In the creation stage, creators select the technological components (User Driven design, UI, Data Security, Privacy) that will support the online community based on the needs of potential members and the purpose of the community. After creation, the growth stage comes in where the online community spreads and members join, while a culture with identity, common vocabulary, shared history, roles, and rituals begin to surface. In this stage, creators must ensure that new members visit the online community and join in, that their integration is smooth, and that up-to-date and quality content is offered. If successful in growth stages, online communities mature into formal organizations, which is the maturity stage. Creators and operators need to focus on their sustainability and continued success. Finally, once online communities mature, they may take several paths. Some sustain themselves and continue to grow and succeed, others change course, and a few cease to exist. This is the sustainability or death stage (Iriberry and Leroy 2009). Needs and needs of members change in each stage of the online community evolution. They require different tools, features, mechanisms, technologies and management activities. Developers and facilitators have to identify the needs in each stage and apply appropriate strategies to better support the community.

If there is concern over barriers then there has to be the presence of credibility in the provided information on OHC. Users may hold the issues they face due to different barriers for a certain amount of time if there is the strength of credible and useful information available on the OHC. The role of a facilitator is very vital in this aspect, as he has to keep the community running smoothly overcoming the barriers at different stages of the community. The facilitator works as the central pole for online communities who have to deal with both information and users and need to modify his working strategies depending upon the need of the hour in different life cycle phases of the community. All these aspects are crucial when one intends to study OHC and I will be including these traits while evaluating the importance of different factors and relationship among them in my study.

An important aspect of research in this direction is to obtain maximum customer satisfaction in healthcare through the established service qualities. According to the research findings by Padma et al. (2010) The quality-measuring factors in healthcare are Infrastructure, Personnel Quality, Process of Clinical Care, Administrative Procedures, Safety Measures, Hospital Image, Social Responsibility and Trustworthiness of the Hospital. Infrastructure factor includes cleanliness and comfort, availability of various treatment related substances within the hospital, timely and hygienic food, appealing and supportive physical infrastructure of the hospital, etc. Elements that come under personal quality are the professionalism and courtesy shown by the hospital management and staffs, care and responsiveness exhibits by the nurses, teamwork and co-ordination shown by various departments, competencies of the service personnel and assistance shown to the visitors. The effectiveness of treatment, error free assessment and robust demonstration, promptness of handling the sudden complications, cordial behavior of doctors are attributes of the process of clinical care. Administrative procedure includes issues like prompt, simple and swift consultation procedure, interconnectedness, and cooperation among different departments, transparent billing procedures, clear and evident information about rules and procedures, timeliness of scheduled appointment/ treatment, etc. Safety measures include adequacy of hygienic care and procedure established for hospital personnel, treatment friendly environment and availability of safety measures like handrails in aisles and ramps for wheelchairs. Sincerity, Punctuality, ethics, brand value and openness towards latest innovation are the components of hospital image. Social responsibility factor

comprises of aspects like fair treatment and ethical practices adopted in the hospital and Provision of medical services with nominal cost to the needy patients. Finally, the factor credibility of a hospital includes aspects like the level of confident on the doctors, accurate and reliable billing process, availability of services as promised, effective management of the operation process and carefulness about patient privacy and confidentiality by the hospital (Padma, et al. 2010). The fulfillment of these factors will bring in satisfaction among the consumers or patients in particular for healthcare industry. Service quality has a direct impact on patient's satisfaction. High service quality results in customer satisfaction and leads to positive behavioral intentions, which are then manifested in supportive word-of-mouth publicity for the hospitals, revisiting the provider, and readiness to pay higher prices (Panchapakesan et al. 2015). In my study I will particularly observe above explained different stakeholders and parameters to observe their role in justifying the service quality aspects in healthcare practices to meet customer satisfaction. How the combination of different parameters help the service provider to meet the customer expectation and provide timely and effective service is surely an important aspect to study and come out with useful findings for the conscientiousness.

Participants are the core actors for whom all the modifications happen in an OHC. It is the participants who drive the strategies applied in every stage of an online community and who result in the success or failure of any such community. In an active forum, participants can identify and correct most false or misleading contents quickly and reliably without requiring professional review (Feedbacks on any suggestions, profile rating, Identity of the expert providing a suggestion, etc.) (Esquivel, Meric-Bernstam and Bernstam, 2006) that describes the importance of participants in any online community. There are three types of participants in an OHC. Blanchard and Markus (2004) initially identify two types of distinctive online participants in virtual environments. Active participants who embrace activities related to posting and responding to messages and passive participants who primarily focus on the reading of messages. Wang and Yu (2012) use the term lurkers to further classify the third type of participants who only just read posts but may not be ready to join the community yet. Study on contribution share by participants in online communities found that a 90-9-1 share is seen, where 90% of lurkers, 9% of contributors who post from time to time and 1% who post very often (Nielsen, 2006). Assistance by facilitators is fundamental because it encourages participants to connect for generating information, which can be further used to seed new discussions, which keeps the community

vibrant. Furthermore, it is interesting to see that among Internet users, female participants were more likely to search for health-related information than male (Jamal et al. 2015). I will assess the role of participants in OHC setting at different situations to suggest any possible model that can be further used by service providers to enhance acceptability to their OHC.

Research has found that the higher the level of public healthcare expenditure, higher is the level of satisfaction with the overall healthcare system (Marmor, & Wendt, 2012). Even though the private sector provides a large section of health services with little or zero regulation (Sandesh & Mohapatra, 2009), in India, people perceive private sector to be easily reachable, better managed and more well organized (Gambhir & Gupta, 2016). This perception of people about healthcare in India leads to two possibilities. One, People are okay with spending more to access the latest and innovative services provided by private service providers and two, the private players need to govern and guided by certain people-oriented service norms to ensure the safety and credibility of treatment. A recent study by Moghavvemi et al. (2017) has found that the internet has been widely accepted as an increasingly important source of health and healthcare information in developing countries and has potential to bring modifications to the current practices (Hohm & Snyder, 2015). This aspect motivated my research orientation to dig into the existing system and analyze the treatment practices to come out with a set of guidelines for government authorities or policy-makers, which they can refer to ensure the usability and credibility of OHC in India. In addition to this, a recent study of The Lancet revealed the importance of public-private partnership to make the healthcare more effective and reachable. According to this, the government should encourage a public-private mix that ensures widespread availability of good quality, affordable care so that the health system meets the needs of the population using technological advancements (McPake, & Hanson, 2016). Considering all these possibilities there will be effort devoted to coming out with valuable suggestions for policy makers in healthcare domain which will be surely of great help to the system and the society considering their work priorities. Healthcare policy makers are interested in the most effective solutions to the most burdensome health problems, the most effective ways to fit these solutions into complex health systems and the most effective ways to bring about desired changes in health systems and existing care practices. (Lavis et al. 2004).

Since this study is based on OHC, it is vital to address the vital factors (both stakeholders and parameters) that have an influence on OHC activities. Using online community for health communication has many benefits: (a) provide health information on a range of conditions; (b) enabling dialogue between different groups of health professionals (c) assemble data from professionals' experiences and opinions (Jiménez-Zarco, González-González, Saigí-Rubió & Torrent-Sellens, 2014). Hectic schedules, the topic relevance of the online community, ICT literacy of participants, presence or lack of moderation and suitable tasks to enhance participation, lack of feedback/responses to posts and forgotten login credentials, can all have an effect on online communication (Ikioda et. al 2013). These factors of OHC operate through multiple dimensions that have an impact on its functionality and usability. The structuring characteristics of a virtual CoP include its demographics (lifespan, age, maturity and orientation of the community), its organizational context (creation process, degree of institutionalized formalism), its membership (size, geographic dispersion, enrolment, topic relevance, prior community experience, stability, selection process, diversity) and its technological environment (Ikioda et. al 2013). As long as the community stays open for new members to join and does not restrict existing members from any kind of participation, there is a higher scope for that community to thrive as new discussions and suggestions will be added by potentially more enthusiastic users (Tarmizi, de Vreede and Zigurs, 2007).

Considering all the factors within this research study will increase the canvas of my study to a very broader area. Therefore, I will be mostly considering the factors that are relevance to IT and Interaction Design for an OHC. This will help me to focus on the scope of this study and come out with a more robust and practical set of recommendations, which will further add value to the body of knowledge. With the evolution of this study and suggestions received from experts, the exact set of factors will be decided that I will be using in the study.

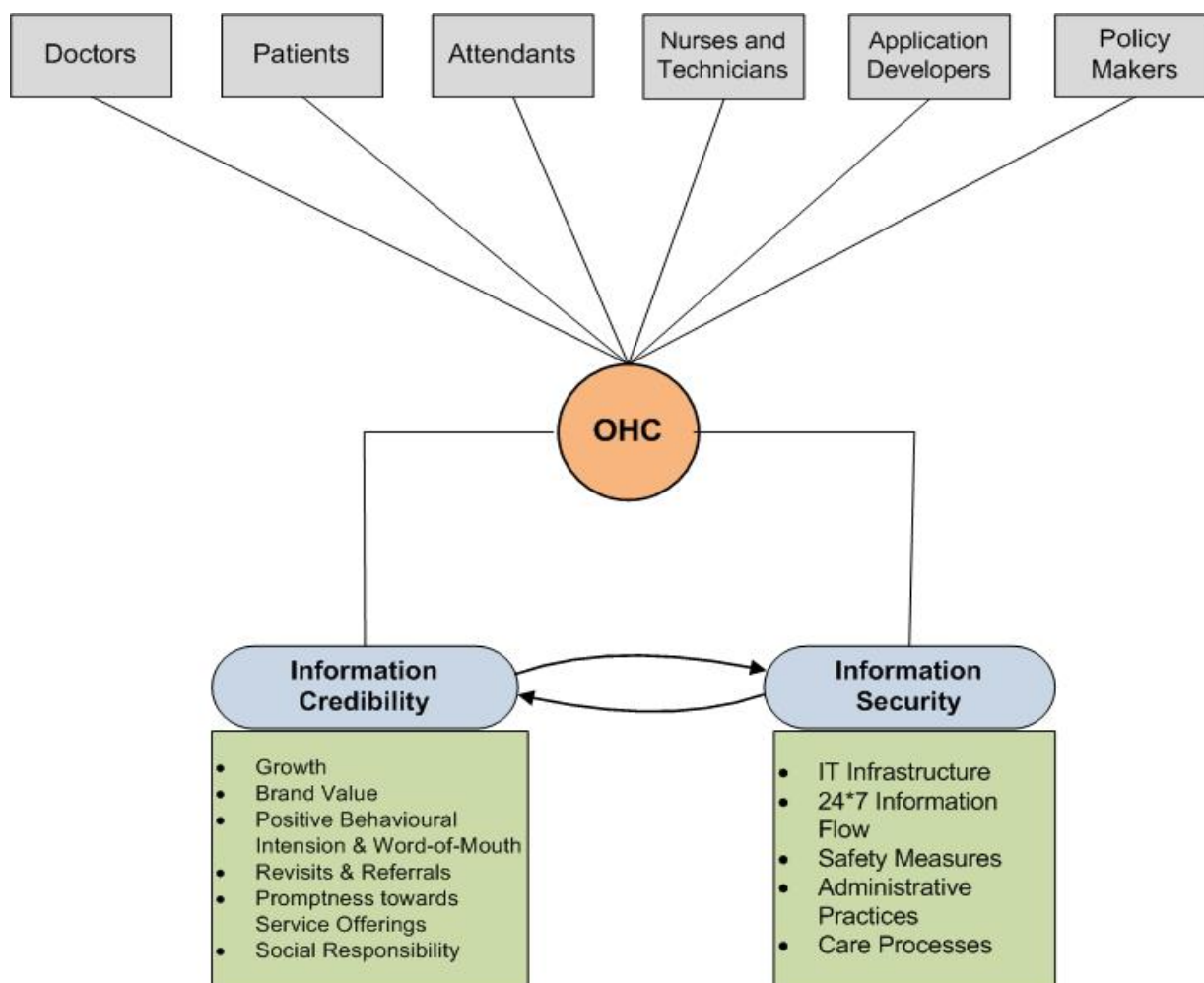
3. The Research

Research Gap

Scope for OHC is enormous and it is getting bigger every passing year. Worldwide, nearly 4.5% of Internet searches are related to health (Yan, Wang, Chen, & Zhang, 2016). The Indian Healthcare industry is growing at a rapid pace (CAGR of 17 percent) and is expected to become a US \$280 billion industry by 2020. While the opportunity for healthcare market is very ripe, India still spends only around 4.2% of its national GDP towards healthcare goods and services (Bang, 2016). Her research also found that current spending by India on healthcare is around 4.05% of its GDP. Furthermore, according to the latest survey of 2016 by 'The Lancet', India stands at number 143rd among 188 nations worldwide on the overall health front. This says India needs to enhance its health sector a lot and academic researchers need to step forward to contribute to this development. The increase in the aging population, uprising incomes of the middle class and the development of primary care facilities are strongly expected to shape the Indian healthcare industry in near future, which is imposing an immense prospect market for Indian healthcare industry to meet the needs of such a highly populated country.

In India, online social media tools and their adoption by healthcare bodies have not been exploited much in comparison with the developed nations of the world and the literature on health literacy is also scanty (Narang, Shukla, & Sen, 2015). It brings the need of scholarly research in this aspect to find out various factors impacting OHC, Interrelationships among those factors and most importantly their individual importance with respect to Indian OHC context. Different stakeholders discussed in this study play important roles in different aspects of the Indian healthcare industry. With the approach of OHC, their roles became more dynamic, open and accessible. It will be interesting to observe how these stakeholders are associating or reacting with various parameters of the OHC as the characteristics of online health practice is surely different than the physical health practice. I hope to address this issue commendable and come out with frameworks/ suggestions for individuals as well as organizations about the implementation and use of OHC.

Theoretical Framework



The theoretical or Conceptual framework is the soul of a research. It represents the understanding of the researcher and his vision about the research. Each person's viewpoint, or point of reference about research, is his/ her *conceptual* or *theoretical framework*, which always helps the researcher totally his research work and validate the developments in different stages (Imenda 2014). Moreover, she explained the necessity of a framework for any research and basic difference between theoretical and conceptual framework. According to her Theoretical framework is used mainly in quantitative researchers and is deductive in nature, whereas conceptual framework can be used both quantitative and qualitative kind of research. A conceptual framework is increasingly suitable for mix methodological research and is inductive in nature. Furthermore, Imenda (2014) explained that both the frameworks help researcher see clearly the main variables and concepts in a given study, a theoretical framework is Application of a theory as a whole or in part whereas conceptual framework is

the Synthesis of relevant concepts. In this study, we are focusing on the theoretical framework due to the nature and vision of the study.

According to Borgatti (1999), a theoretical framework is a collection of interrelated concepts like a theory, which may or may not be sufficiently worked out. A theoretical framework guides a researcher to determine what things he should measure and what statistical relationships he should look for. A theoretical framework is also the application of a theory or the concepts drawn from that same theory to offer a description of the core idea or highlight a particular phenomenon or research problem (Imenda, 2014). In the above-presented framework different stakeholders and parameters associated with Indian care practice are shown with respect to OHC. Various stakeholders who are addressed in this framework are doctors, patients, attendants, nurses and technicians, application developer and the organizational force behind them and the policy makers of the healthcare industry in India. Different impacting parameters such as IT Infrastructure (Hardware, Graphical User Interface (GUI), Application Navigation), Contents and its relevancy, Information Security and Credibility are also discussed in the framework. In addition to this, the role of facilitator or moderator or system admin is also discussed elaborately who has a vital role in control and coordination entities in OHC. The relationship among these stakeholders and parameters will be assessed with the intervention of facilitator in an OHC in Indian context.

Research Objective

Seeing the present acceptance and scope of OHC worldwide, it can be expected that online medium is the future big mechanism in the care industry. Therefore, it is important to find out important factors associated with care practices through an online platform and document the inter-relatedness among them. The objectives of this study will focus on the different important attributes discussed in the literature review section and their efficiency and usability in an OHC context.

One of the most important objectives of my research will be to underscore the important factors in OHC context. This will help to segregate the study into proper structure and come out with a more valid output. Figuring out important factors impacting OHC will also help me to find out interrelationship among them. This will further enable me to highlight individual importance of these factors in Indian healthcare context.

Another important objective of this study is to observe the vital features of an OHC and come out with a tangible model to offer the functionalities that are highly needed by end users. This will additionally help the service providers to understand the strategies to motivate users to participate in the community actively and seek and share information regularly.

Technical aspects are crucial objects in an OHC. To evaluate the technical aspects with their functionalities, investigate the role of IT infrastructure and Human Computer Interaction (HCI) aspects and the need of user friendly GUI with 24*7 information flow is another vital objective of this study. This will help the application developers and managers to understand the expectations of the users better and come out with a user friendly and effective online application.

In addition to this, the role of a facilitator or moderator is very significant in any online community. But there is no proper set of guidelines or framework to ensure the effectiveness of a facilitator, which I want to establish through this study. Furthermore, understanding the prominence of policy makers in healthcare industry, I aim to come out with effective, practical and progressive suggestions for policy makers for an OHC environment. As a whole, the core objective of this study is to evaluate the existing practices associated with OHC and come out with a set of futuristic, tangible and smart recommendations for entities associated with OHC.

Research Question

The broader research question is to find out **the important factors that can impact the functionalities and acceptance of OHC in India and up to what extent**. This question can further be divided to multiple sub-questions to accommodate different possible angles within the scope of the study. The sub-questions can be:

- ✚ What are important variables in OHC in India
- ✚ How these variables related to each other and what betterment can be done to increase the acceptability of OHC in India.

4. Research Design and Methodology

In the literature review section, it has been seen that there are multiple important factors associated with an OHC that can have a vital part in its development and success. A concrete study needs to be done to endorse the important factors that can impact an OHC in order to enable a healthcare organization to remain competitive in the market and to serve its customers in a more efficient manner. Mohapatra and Mohanty (2016) have done a recent study on online writing community where they have very efficiently designed the research. Since this study is also considering the online practices like their study and is looking into few parameters those they have considered, some inputs have taken from their study while designing the research and methodology. All the attributes of this study have taken into considering while developing the design and scope for the accommodation of any further valuable entity in the future is also considered to strengthen the study with every acquiring experience. This study will be accomplished using quantitative research methodologies that are discussed below.

Survey instrument: The objective is to identify different factors that would have an impact on development, practice and acceptance of OHC. The fundamental effort will be to garner the responses through a primary survey. The survey will be done with a structured questionnaire, which I will physically execute. This questionnaire will be constructed using a Likert scale of 1–5 with 5 being the most important and 1 least important. The respondents will be asked to fill the questionnaire by allocating the degree of importance (by choosing from this scale of 1–5) as a response to each question. The questionnaire will include all the important factors, which will be decided considering all the research questions.

Sample selection: The sample will be various stakeholders explained in above theoretical framework. The response of the stakeholders with respect to above-noted parameters will be captured. I will approach all the stakeholders associated with an OHC and capture their responses in this questionnaire.

Data Source: Doctors, patients, attendants, hospital staffs, senior managers and developers of selected existing online communities in Indian healthcare sector. Two locations: Bhubaneswar, Odisha, and Bangalore, Karnataka has been decided for the data collection. Hospitals in Bhubaneswar like Apollo, Kalinga, and Care

will be visited to collect data from doctors, patients, attendants, nurses and technicians. Application developers, senior managers, and management of few IT service providers in healthcare domain from Bangalore will be contacted to acquire relevant and latest data on their part.

Analysis: After the responses will be gathered, the factors considered will be checked for any interdependency among them. This will be accomplished using the Exploratory Factor Analysis. After this, the factors will be modeled using Structural Equation Modeling where Confirmatory Factor Analysis and Path Analysis will be performed on the received data set. The quantitative metrics will be done to test validity and reliability of the model. The results obtained will be interpreted to conclude about the relative importance of these factors influencing the development, usability and success of an OHC.

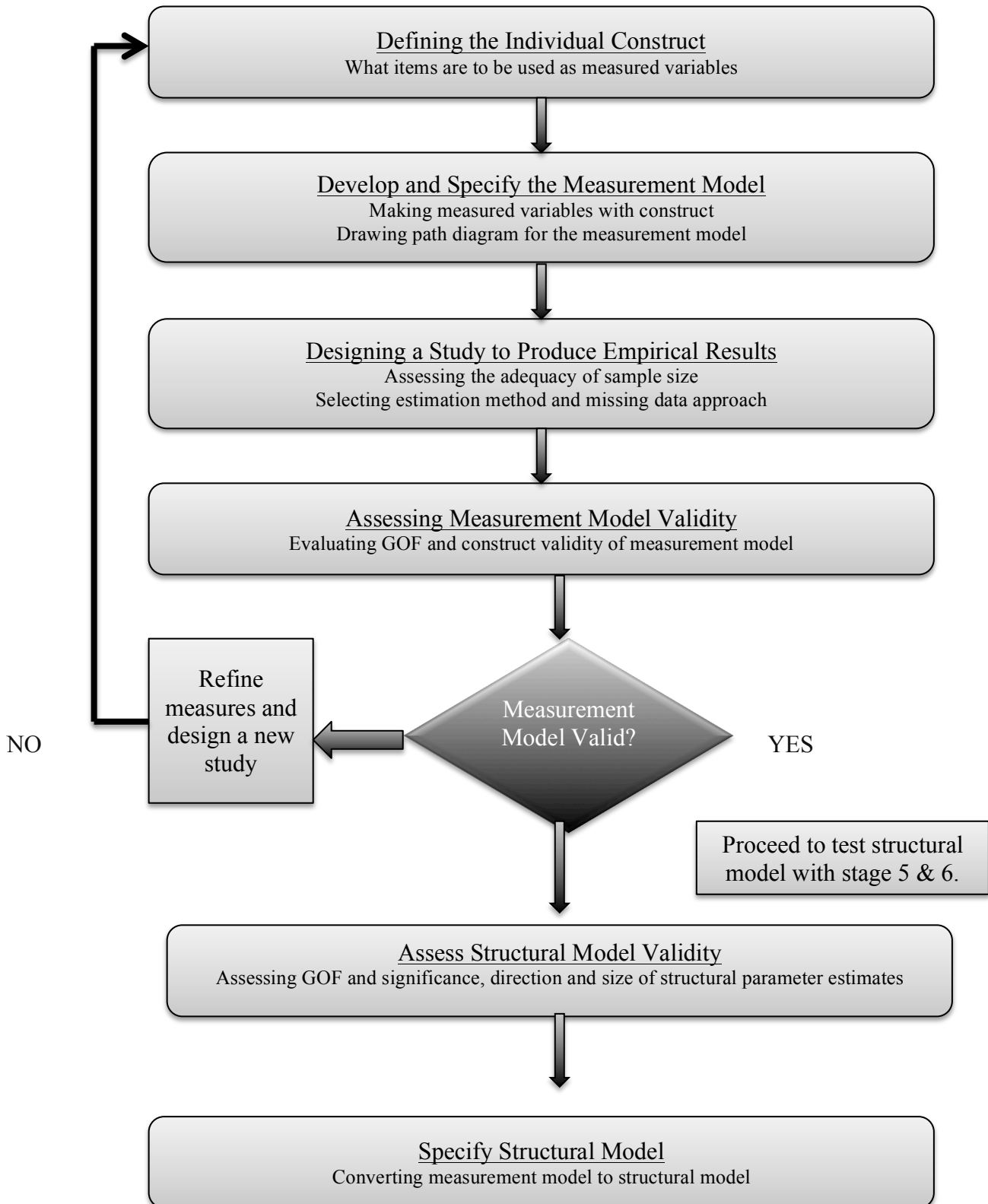
Exploratory factor analysis: Exploratory Factor Analysis (EFA) commonly referred, as Factor Analysis is a multivariate technique in the interdependency method. It is basically used to elicit the dimensions of a group of variables out of a pool of observed variables that might exhibit interdependency among them.

Confirmatory Factor Analysis: Confirmatory factor analysis (CFA) is a statistical technique that is used to verify the factor structure among the observed variables. CFA will be undertaken to Define individual construct, Develop the overall measurement model theory and assess the measurement model theory validity.

Structural Equation Modeling: Structural Equation Modeling (SEM) is a multivariate statistical analysis technique that is used to analyze structural relationships. SEM will provide a very convenient and valid framework for analysis. As explained by Hair et al. (2006) in their book: Multivariate data analysis, SEM technique can examine a series of dependence relationship simultaneously, therefore highly useful in testing theories that contain multiple equations involving dependence relationships. They also said that SEM provides a comprehensive framework in which to estimate complex sets of relationships and incorporate specific measurement properties of latent constructs as well. Therefore, I am considering this multivariate technique combining aspects of factor analysis and multiple regression, which will help me to figure out important factors impacting OHC, relationships among those factors and any possible construct combining all the important aspect that can further guide the developers, users and service providers of OHC.

The six important steps that I will be following, which Hair et al. (2006) has explained in their book to ensure an effective and valid SEM implementation, are:

- i. Defining Individual Construct
- ii. Developing the overall measurement model
- iii. Designing a study to produce empirical results
- iv. Assessing the measurement model validity
- v. Specifying the structural model
- vi. Assessing structural model validity



Reliability analysis: As a measure of the scale reliability, Cronbach's Alpha will be calculated for each variable. It is a measure of the internal consistency group i.e., how closely the variables are related to each other within a particular factor.

5. Implementation Plans

The remaining research process is expected to be completed within next two years. The detail expected timeline would be as follows:

- + Data Collection: 6 to 8 months, i.e. by August 2017
- + Data Analysis: 3 to 4 months, i.e. by December 2017
- + Thesis Writing: 5 to 6 months, i.e. by June 2018
- + Thesis Submit and other Requirements: 4 to 6 months, i.e. by December 2018

(* This is a tentative time plan and may get modified depending on the real time requirements)

6. Expected Outcomes

Multiple useful and real-time suggestions are expected from this research. There will be observations, recommendations, and references for the service provider, service receiver, and the participating experts. This study is expecting to shape the existing practices related to online behavior, come out with useful recommendations for the stakeholders in healthcare domain about their online activities and moreover add value to the society by helping the individuals and service providers to build a smart, user-friendly and informative community. Below are few of the possible outcomes from this study for different entities.

Multiple suggestions expected for this segment from the study. The crucial factors, which an OHC must have and without which the success of the community will be at risk, will be explained. Preference of users, as well as doctors, will be documented to let the service providers understand the importance of those aspects intensely. This understanding will entitle the service providers to come out with a modified and user-friendly

online application that will help them to obtain maximum customer satisfaction and success in their motivation behind the online movement.

Various crucial factors for users in an online community like information credibility, privacy, proper usage will be addressed in this study along with the useful guidelines regarding norms, policies and smart ways to participate and obtain useful information as per their need. The possible recommendations that are expected from this study will educate the users of OHC with latest and smart procedures, which are needed to follow while communicating in an OHC. The OHC users will be benefited from this study up to a large extent in shaping their attitude towards such forums and acquiring additional knowledge to get maximum outcomes to justify their need.

Doctors and health experts are the backbones of any OHC. It is expected from this study that various issues faced by doctors like unaware about the functionalities, risk behind any movement and discomfort about the developments in an online community will be addressed properly and practical recommendations will be stipulated. This study also expects to let the doctors understand the latest changes in the consultation process, develop patient-centric service approach and perform suitable actions to gain reputation in the market.

Policy makers are very crucial in order to keep the legal parameters active in care practices. Healthcare policy makers are there to ensure the quality and standard of care provided by service providers. Therefore, there should be a proper set of guidelines and instructions for policy makers in order to keep the standard of practices intact in OHC context. As the OHC is comparatively a new entity in India it will be very useful for the managers and policy makers in keeping the practice standards acceptable and effective.

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