ETHICAL ISSUES IN HEALTHCARE SERVICE INNOVATION

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Abstract

The purpose of this study is to shed light on ethical issues in healthcare service innovation. The qualitative approach was employed by using an in-depth interview as the main data collecting tool. Participants consisted of seven service providers and five users from both public agencies and private companies. The finding showed that the users are unaware of service safety by trusting service providers without a proper judgement. For the service provider, the result showed that the organization in the early stage of implementing healthcare service innovation is facing with two ethical problems including inappropriate organizational responsibility to employee and consumer.

Keywords: *Ethics, Healthcare, Service Innovation*

Introduction

Service industry plays a vital role in driving the world's economy. Thailand's service sector accounts for almost half of the national income and has a major stake in national employment. The total value of the domestic consumption in service sector and service export rate has continuously been growing for more than ten years. According to the 40th Economics Conference at Thammasat University, Thailand exported service with a value of around 67,685 USD in 2016. As a result of a significant role of service sector, the Thai government has launched the "Thailand 4.0" development plan supporting and driving service sector. The model is focusing on becoming a value-based and innovation-driven economy by moving from producing commodities to innovative products; emphasizing on promoting technology, creativity, and innovation in focused industries and from a production-based to a service-based economy (The 12th National Economic and Social Development Plan). There are five industry groups including; group one, food, agriculture and biotechnology; group two, healthcare and medical technology; group three, robot and electronic controlling machine; group four internet, digital technology, and artificial intelligence; group five, innovative innovation and culture, and high valued services (The 12th National Economic and Social Development Plan).

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According to the statistical report of the department of business development indicated the healthcare service industry is one of the target sectors under the Thailand 4.0 development plan, which was the highest growth sector in terms of foreign investment, 117,551 THB (The department of business development, 2017). Moreover, the healthcare service industry has been using some advanced technology such as; internet of things (IoT) which is used as a real-time data collecting device and transmit data via cloud-based system in order to increase the accuracy of data analysis in hospital; artificial intelligence (AI) is used for facilitating medical diagnosis; and robot is used for medical surgery and elderly's caretaker. Due to the arrival of service innovation in healthcare which does not only create advantages but also disadvantages, Omachonu and Einspruch (2010) concerning about patient safety, data privacy, and ethical issues in using the innovation healthcare system. However, both service providers and users should aware and emphasis on using service innovation technology by concerning on ethical issues in order to create sustainability in healthcare service innovation sector. The next section presents our research objectives.

Research objective

The primary purpose of this study is to shed light on the ethical issues from both service provider and user perspectives in healthcare service innovation.

Literature reviews

1) Healthcare Service innovation

Health care or healthcare defined as diagnosis, treatment, and prevention of diseases, injuries, and disorders both physical and mind of human. Health care is delivered by practitioners in dental medicine, pharmacy, nursing, and allied medicine. Health care system varies from country to country (World Health Organization, 2009).

Service innovation defined as a new concept or changing in product (Van Ark, Broersma, & den Hertog, 2003), process (Menor & Roth, 2007), service business model (Ostrom et al., 2010), which are value for existing customers and future customers as well as value for the service innovation developer (Toivonen & Tuominen, 2009).

Healthcare service innovation defined as the launching of a new concept, idea, service, process, or product in order to improve treatment, diagnosis, education, outreach, prevention and research, and with the long-term goals of improving quality, safety, outcomes, efficiency and costs (Omachonu & Einspruch, 2010). Besides, information and communication technology (ICT) plays a significant role on driving the healthcare service innovation by reducing a distance barrier between healthcare users and healthcare service providers, especially in developing countries where there is a shortage of human resources in public health (Chib & Chen, 2011).

2) Innovation technology

The Gartner 2012 Hype Cycle divided the complementary emerging technologies into five stages. The first one is innovation trigger stage such as smart dust, artificial general intelligence, and smart robot. The second stage is peak of inflated expectations such as IoT platform, deep learning, and machine learning. The third one is trough of disillusionment such as cognitive expert advisors and augmented reality. Fourthly, slope of enlightenment such as virtual reality. The last stage is plateau of productivity, there is no emerging technology in this stage. In addition, Internet of Things (IoT), Mobile Robots, and Artificial Intelligence (AI) may widely be used in service sectors and the healthcare service as the following details.

Internet of Things (IoT) is a network of interconnected of devices which have the ability to transfer needed information via a cloud-based system. The three elements of IoT including: (a) Hardware—made up of sensors, actuators and embedded communication hardware (b) Middleware—on-demand storage and data analyzing tools (c) Presentation—interpretation tools and illustration which can be widely accessed on different platforms (Gubbi, Buyya, Marusic, & Palaniswami, 2013).

Robot is an integration of various technologies such as sensors, software, telecommunication tools, actuators, motors, and batteries which make the robot has ability to interact with its atmosphere with some human supervision, via telecommunications or even completely automatically. For instance, robots have widely been used for aged care by cleaning house, monitoring health condition and home security. All data such as photo, video, and voice of elderly in everyday life will be recorded by the robot (Lin, Abney, & Bekey, 2011) and sent to the information center. Moreover, robots have used as an entertainer called companion type of social robots, looked like pets, interact with elderly for physical and emotional purposes (Iancu & Iancu, 2017).

Artificial Intelligence (AI) is intelligence demonstrated by machine which is invented by human. AI has ability in thinking, making a decision, and expressing their thinking by acting (Nilsson & Nilsson, 1998). AI can be classified into four groups by its intelligence including; 1) Mechanical intelligence can complete tasks as unskilled labor such as a routine task without much variation; 2) Analytical intelligence has ability to analyze information to be able to problem solving and learn from the previous task; 3) Intuitive intelligence has creative thinking and adaptively to novel situations; 4) Empathetic intelligence has ability to recognize and understand human's emotion and react appropriately (Huang & Rust, 2018).

3) Business ethics

Ethics is a set of beliefs about right and wrong behavior within a society. Ethical behavior conforms to generally accepted norms, many of which are almost universal. Ethics is different from moral and law. Morals are individual's beliefs about right or wrong; ethics describes standards or codes of behavior expected of an individual by group to which individual belongs. Law is a system of rules that tell us what we can and cannot do (Reynolds, 2011).

Business or organizational ethics is the study of what constitutes right and wrong, or good and bad, human conduct in business context (Shaw, 2016). Business ethics can be classified into five levels including individual level, organizational level, association level, societal level, and international level (Carroll, 1978). Professional codes of ethics in the information technology professional organization are ethical decision making, high standards of practice and ethical behavior, trust and respect from the general public, and evaluation benchmark (Reynolds, 2011).

- Ethical decision making – Adherence to a professional code of ethics means that practitioners use a common set of core values and beliefs as a guideline for ethical decision making.

- High standards of practice and ethical behavior – Adherence to a code of ethics reminds professionals of the responsibilities and duties that they may be tempted to compromise to meet the pressure of day-to-day business. The code also defines acceptable and unacceptable behaviors to guide professionals in their interactions with others. Strong code of ethics has a procedure for censuring professionals for serious violations, with penalties that can include the loss of the right to practice. Such codes are the exception, however, and few exist in the IT arena.

- Trust and respect from the general public – Public trust is built on the expectation that a professional will behave ethically. People must often depend on the integrity and good judgement of a professional to tell the truth, abstain from giving self-service advice, and offer warning about the potential negative side effects of their actions. Thus, adherence to a code of ethics enhance trust and respect for professional and their profession.

- Evaluation benchmark – A code ethics provides an evaluation benchmark that a professional can use as a means of self-assessment. Peer of the professional can also use the code of recognition or censure.

Business ethics are classified as dimensions of the total quality of a society. These dimensions of quality characterized by the social responsibility of corporation, companies, and enterprise, and are becoming increasingly important for preservation and development of the society and for market competitiveness and company reputation. Ethics and social responsibility have both internal and external aspects (Horner & Swarbrooke, 1996)

In service and hospitality industry, the ethical issues imply welcome, friendliness, comfort, security, openness, communicativeness, and kindness. The goal of the service and hospitality industry is to please people, to give them the sense of well-being that everybody wants (Holjevac, 2008).

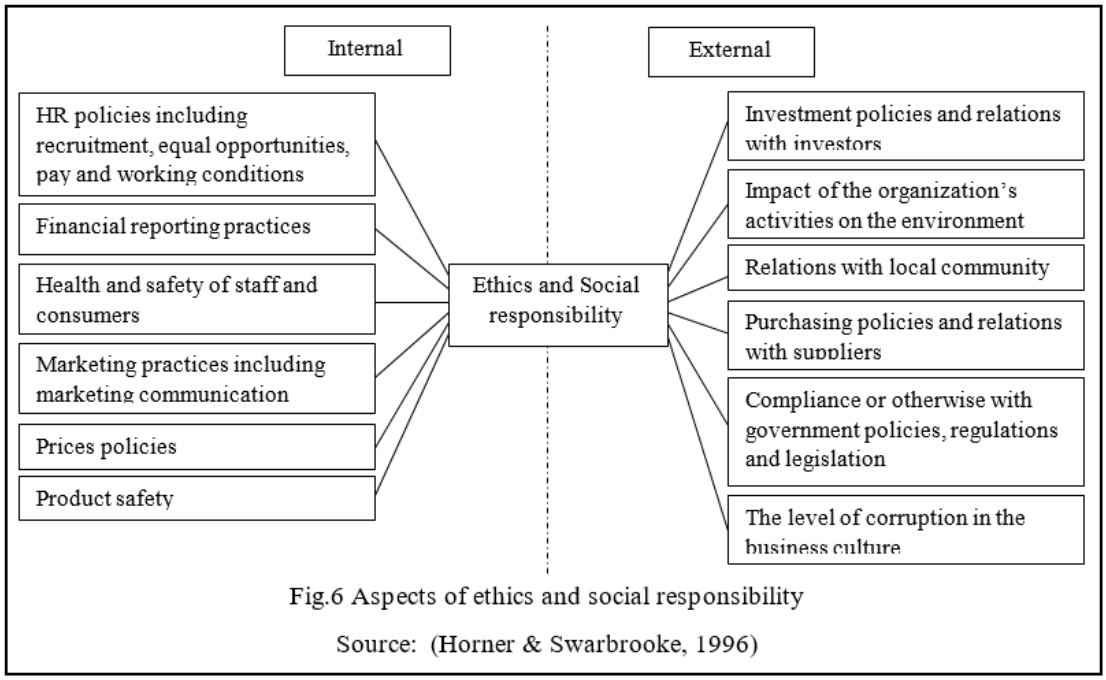

Fig.6 Aspects of ethics and social responsibility

Source: (Horner & Swarbrooke, 1996)

4) Ethical issues in innovation technology

In the era of technology disruption, innovation technology such as robot, AI and IoT have become a part of service delivery. However, innovation technology is still concerned with ethical issues by scholars and practitioners.

Data privacy and security issues were mentioned by Weber (2015) that IoT devices gather a huge amount of confidential information in healthcare industry and have a privacy risk in accessing and using data. Li Shancang , Tryfonas, and Li Honglei (2016) added that data confidentiality and data security might be considered in the process of designing the healthcare security architecture. In case of healthcare robot, there is a function to record every moment in everyday life of elderly including inappropriate moments such as having shower. Lin et al. (2011) mentioned that it is not only personal data in everyday life was recorded, but also private landscape inside the house. Nomura, Kanda, and Suzuki (2006) found that elderlies fear and feel uncomfortable in interacting with robots.

The safety issue is the primary concern for robot invention called robot law, the robot must not harm humanity and not injure human being (Ashrafian, 2015). In term of economics ethical issue, emerging advanced technology such as AI and robot impact on employment by replacing service robots instead of human workforces (Qureshi & Syed, 2014).

Methodology

In order to reach the ethical issues in healthcare service innovation, a qualitative approach was utilized and shaped using an inductive design (Ormston, Spencer, Barnard, & Snape, 2014), to understand and reconstruct both service providers and users in regard to healthcare service innovation. The service

providers have a direct involvement in term of policy and implementation. One the one hand, the users have a first-hand experiences with the healthcare service innovation. Methods are the step-by-step techniques that researchers adopt in a systematic process (Daymon & Holloway, 2010). For this study, there were systematic procedures and tools used in order to gather and analyze the data related to the research questions by utilizing in-depth interviews.

1) Tool

In-depth interview was used to gather data. The aim of the interviews was to: understand the informants' perspectives and to collaboratively create a meaningful account of the research topic area from each viewpoint; to identify and understand their behavior towards healthcare service innovation. Due to the barrier of time frame and distance, we used both face-to-face interview and telephone interview. Afterward, the interviews were recorded and transcribed verbatim.

During the interview process, we had a well collaboration from both service provider and users. Moreover, services provider accompanied us to the research field and introduced us to their users which was the easy way for us to build a good relationship with participants. Creswell and Miller (2000) mentioned that credible data comes from close collaboration with informants throughout the process of research. As a result of a good relationship with participants, they were comfortable and opened mind to share and give information with us. We had sent an official letter to targeted organizations in order to inform our purposes and indicate some need collaborations from participants

2) Participants

We started exploring service providers from press news during January 2013 and September 2018 via both online and offline channels in Thailand. According to the exploring, we found two government agencies in Thailand that are the pioneer in using healthcare service innovation. For the private company, we found a well-known organization that has been developing an aged care robot for a decade in Thailand. Another one of a private company developing healthcare application on mobile. According to Palinkas et al. (2015) this is the best approach for qualitative research that aims to identify information-rich cases related to the phenomenon of interest. In the process of selecting participant, we follow data triangulation method "Person triangulation" by recruiting the informants from multiple roles (Khanal, 2012). Participants consisted of both service providers and users. The service providers are top management level through functional level. The different roles of participants make some advantages such as gaining different point of view, increasing trustworthiness and validity in qualitative research (Creswell & Miller, 2000). We provide more details of the participants as following;

2.1) Government agency A, employing IoT technology to monitor an emergency situation of elderly who are living in the responsibility area. The key informants including a top management and three functional staffs.

2.2) Government agency B, employing robot as a communication tool between patients who go back home for recovery and healthcare provider at a hospital. The key informant is a head of department.

2.3) Private company A, inventing healthcare innovation and specializing in aged care robot. The key informant is a top management.

2.4) Private company B, a startup business which develops healthcare application on mobile via Line chat in order to help and suggest some helpful information to informal caregivers. The key informant is top management.

The user cohort consisted of three IoT users who are using a healthcare device, in order to monitor the emergency situation, provided by the government agency A. Another group of users who are using mobile healthcare application provided by the private company B.

Consequently, the appropriateness and usefulness of a qualitative approach, together with triangulation of data sources, reduce possible bias in this study and impart greater trustworthiness.

a. Data Analysis

According to Braun and Clarke (2006), thematic analysis is a flexible and useful research tool. It allows those using it to make active choices about the particular form of analysis they are engaged in. Moreover, it has the potential to help those seeking to describe patterns across the qualitative data and can lead to a more sophisticated accounting of the data. For studies using the qualitative approach, thematic analysis is frequently used at present to analyze data obtained from interviews. Formalizing the identification and developing themes are a part of the process, which also includes two other elements: 'reporting the data and theorizing the language' (Jugder, 2016).

Following Braun and Clarke (2006), the data analysis in this study consisted of a six-step process, which provided clear steps:

Step 1: Becoming Familiar with the Data. All interviews were transcribed word by word, to identify any areas needing clarification. Transcripts of the data were repeatedly re-read as an active form of double-checking them against the original audio-recordings for accuracy, including searching for meanings.

Step 2*:* Generating the Initial Codes. The process of analyzing and coding was accomplished line-by-line and by labeling almost every line in the interview transcripts, in order to extract those phenomena or experiences that were significant to participants.

Step 3: Searching for Themes. When all data was initially coded and collated, it was then identified across the data set, examining larger swathes of data by combining codes that were similar and considered as having the same role.

Step 4: Reviewing the Themes. This step, an important self-correcting phase of the research, involved re-reading the entire data set to allow any relevant data and directions to surface naturally.

Step 5: Defining and Naming the Themes. To gain a deeper understanding of actual behavior among both participant cohorts, the key themes were defined by determining which aspect of the data each theme captured, in order to identify what was interesting about an ethical issue in healthcare service innovation.

Step 6: Producing the Report. The final stage was writing up the thematic analysis to report the ethical issues data.

Findings

This section presents the data from in-depth interviews with healthcare service innovation providers and users, from their viewpoints, regarding the current perception, understanding, and actual used of healthcare service innovation. The answer from both service providers and users will shed light on the ethical issues in using healthcare service innovation.

According to thematic analysis, the results consisted of three key themes, including business responsibility to customer, business responsibility to employee and consumer responsibility that can be summarized as follows:

1) Business responsibility to customer

1.1) Customer-oriented policy, based on in-depth interviews of the three top management informants from both government agency (A) and private company (A, B) indicates the positive responsibility to customer in term of policy in similar directions that they have a customer-oriented policy as a key point by focusing on what the customer needs and trying to fulfill them as much as possible.

"In the designing service innovation, we invited our customer as apart of design team……we spent much money in consumer research for understanding customer insight." (CEO, private company A)

"Our service innovation must be harmonized with the customers' lifestyle." (Founder, private company B)

"We had chosen an appropriate service innovation for the elderly because they have no idea about the innovation but we asked the elderly for the feedback." (Mayor, government agency A)

Moreover, the service providers informed users by using public relations before implementing healthcare service innovation

"We communicated to the elderly that we are trying to raise their well-being by employing an advanced and efficiency innovation technology protecting them from emergency situation." (Mayor, government agency A)

All informants from both government agencies and private companies have the same customer-oriented policy. However, there is a small difference in term of customer involvement, for the private companies, they invited their customers to involve at the beginning stage of service designing process but not for the government agency.

1.2) Safety on policy but …, based on in-depth interview, the positive responsibility to customer in terms of consumer safety was indicated by the top managements as one of the first priority and put in the business policy as major concern in developing and using healthcare service innovation.

"Customer safety is our primary concern, our team consists of doctors, nurses, academicians, computer technicians and also customers working together in order to develop a safety service innovation." (CEO, private company B)

"Elderly injuring may occur at any time.....we believe that a preventive approach by protecting them from trauma is better and cheaper than treating them." (Mayor, government agency A)

Thus, I conclude that all three organizations have a responsibility to customer in the policy level by employing customer-oriented policy and concerning consumers' safety issue. On the other hand, we found unsafety issue on implementation as following;

1.3) Unsafety because of an inefficient system, we found unsafety issue occurring in the implementation level due to inefficient healthcare service innovation system. One (out of 3) functional staff mentioned that there is a technical error in their service innovation system.

"The system crashes very often. I have to wait for the technician because I don't know how to fix it." (Functional staff 1, government agency A)

1.4) Unsafety because of inappropriate staff, based on in-depth interview, we found inappropriate staffs who do not have important skills such as take a responsibility to monitor the innovation system.

"I had no idea dealing with the service innovation system when the emergency alert had shown.....I do not have public health knowledge to evaluate elderly's health condition.....I have no neither computer literacy nor English skills." (Functional staff 2, government agency A)

"I will ignore when the system alert during my duty, because I don't have computer skills and English literacy.....I have never been trained for the system..... only two staffs are having the ability to use it" (Functional staff 3, government agency A)

Thus, I conclude that safety risk is happened during the implementation stage because of inappropriate staff and inefficient system, even the service provider has a well-designed policy in customers' safety.

2) Organizational responsibility to employee

2.1) Unfairness in job allocation, based on in-depth interviews from both sides of policymakers and implementers in two government agencies which are in the beginning stage of employing service innovation. We found business irresponsibility to the employee in terms of human resources management.

".....The public health staffs have a responsibility in this project, but we allocate the project to the disaster prevention and mitigation staffs due to the public health staffs do not work 24 hours." (Mayor, government agency A)

"We have many routines to do. Healthcare monitoring is not our task." (Functional staff 2, government agency A)

2.2) Lack of training, we found that one organization assigns their functional staffs to take a responsibility without training which is not only effect on staff performance but also customer safety.

"I will ignore when the system alert during my duty, because I don't have computer skills and English literacy.....I have never been trained for the system.....There are only two staffs having the ability to use it" (Functional staff 3, government agency A)

Thus, I conclude that poor human resources management including job allocation, job training lead to a lack of organizational responsibility to employee. Furthermore, an inability staff ignores to provide a good service which might affect on customer safety.

2.3) Unfair compensation, we found a financial problem which effects on wages due to a limited budget, staffs have to do more tasks beyond their routine without extra payment.

".....As a result of a limited budget from central government, we do not money to employ any appropriate staffs for this project, and we do not have money to pay as an overtime wage." (Mayor, government agency A)

In addition, the functional staffs expected to have some extra money for the extra task but they do not have enough power to negotiate with the management level.

"We do not have any extra money from the extra task, monitoring healthcare service innovation system, but in my opinion, we should have it." (Functional staff 3, government agency A)

Thus, I conclude that unfair compensation is a sensitive ethic issue for employee who has to take a responsibility on a new routine which is not under their job description.

3) Consumer responsibility, based on discussions found that all three elderly service innovation users who are lack of technology literacy, trust in information communicated by service provider without concerning in negative effects and consumer rights.

"I used the healthcare service innovation because of the doctor's recommendation." (83-year-old Female, IoT user)

"I have no idea about the technology but I trust in the doctor." (73-year-old Female, IoT user)

"I do not doubt the service innovation. The service provider communicates to me that it is safe and helpful.....I trust in them." (85-year-old Female, IoT user)

In addition, the terms of "Doctor" for the elderly in this study does not mean a physician. It means the public health staff.

Thus, I conclude that users' trust in both personal and organization lead users to believe in information without an appropriate judgement. The users neglect the responsibility to aware of the quality and safety of goods and services before purchasing.

Discussion and implication

This section presents a discussion generated from the important themes to shed light on the ethical issues from both service provider and user perspectives which is the main objective. In alignment with the

study aims and based on its data analysis, the findings are investigated within the context of the current understanding and actual behavior, with healthcare service innovation, from service provider and user viewpoints.

Ethical issue from the user perspective, the participants in this research are elderly who are lack of understanding and confidence in healthcare service innovation technology. The users have less consumer responsibility in terms of product safety awareness and consumer rights protection because of trust. According to the finding, the meaning of trust for the elderly is trust in influencer and/or organization in a particular government agency. According to the theory of reasoned action, trust produces positive attitudes toward electronic commerce websites that are likely to decrease fears of retailer opportunism and attenuate infrastructure concerns and lead to purchasing behavior (Pavlou, 2003). As a result of trust, the users believe in exaggerated communication of the service provider. For instance, the service provider communicated that their healthcare service innovation was invented from high technology, trustable and well-performance without error. In fact, we found some technical errors such as system failure, inability of staff.

In order to raise consumer responsibility, public sectors together with education institutes, should have some collaboration programs to educate users in particular elderly in basic knowledge of information technology. For example, free short courses providing the information technology knowledge such as safety, privacy, and security issues in order to realize users in trusting service provider.

Ethical issues from the service provider perspective, the result showed that the poor human resources management makes the unethical issues in terms of organizational responsibility to the employee. In this research, the two out of three organizations are in the early stage of service innovation adoption. We found that the organization put the inability staffs to take responsibility for the new healthcare service innovation without training. As a result of the inability staffs effecting on service delivery, a staff told that he would ignore using new service innovation and reject to provide a healthcare service during their shipment. Moreover, the staffs who take responsibility for the new healthcare service innovation faced with unfair extra payment. They have to do more routine which is not under their job description without any compensation. Dhillon and Backhouse (1996) indicated that the organization implementing a new technology would face with risk, if they do not evaluate the nature of the organization environment such as information technology infrastructure, organizational structure, employee 's computer literacy.

For micro-level implication, in terms of business policy, the healthcare service providers need to focus on proactive ethic policy by putting ethical issues as a key element of service innovation designing process, rather than addressing the problems that arise after introducing service innovation into the market. Concentrating on ethical issues from the first stage of the development process can reduce the ethical problem that may arise in the future (Brusoni & Vaccaro, 2017). In term of human resources management,

the service providers should prepare and train their staff to be ready for the new service innovation. Moreover, healthcare service innovation complicate and deal with mortality, staffs who take responsibility should have skills to be able to evaluate health situation and also have computer skills in order to command the service innovation system. Thus, well-trained staff is a key of increasing service outcomes.

Conclusion

The research study unveils the ethical issue in healthcare service innovation. The research shaded light ethical issues from both service providers' and users' point of views by employing the qualitative approach. In-depth interview is used as a data collecting tool. In terms of users, the finding showed that trust in influencer is a key to accept healthcare service innovation of users. Moreover, trust leads users believing in exaggerated information. In term of the service provider, the result showed that inefficient human resources management create less organizational responsibility to the employee.

Future research should apply a longitudinal study to gain more insight and see more different in using service innovation. Moreover, future research should follow methodological triangulation by using multiple data collecting methods such as focus groups and observation to improve more validity, reliability, and generalizability of qualitative research.

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