A Long-term Care Service Process Improvement with Application of Double Diamond Design Model and Customer Journey Map

(Work in Progress)

Eldon Y. Li, National Chengchi University, NO.64, Sec.2, ZhiNan Rd., Taipei, Taiwan
Tel. 886-2-29393091, eli@nccu.edu.tw

Laurence Fang-Kai Chang, 168, Da-Yeh University, Rd., Dacun, Changhua 51591, Taiwan
Tel. 886-4-8511888 #3136, fkchang@mail.dyu.edu.tw

*Min-Chi Huang, Da-Yeh University, 168, University Rd., Dacun, Changhua 51591, Taiwan
Tel. 886-4-8511888 #3136, r0521001@cloud.dyu.edu.tw

ABSTRACT

With advances in medical technology and medicine, birth and death rates have been declining year by year. The proportion of the world's elderly population has risen sharply. Aging society has become a major problem and its derivative phenomena and problems have gradually emerged. In response to changes in the community and its needs, the government introduced Long-Term Care 1.0, which provides services to disabled and dementia seniors. Hopefully, the negative impact of population aging can be eased.

In the long-term care system, people attach the highest importance to home-based care. The past mainly focused on the detection of physiological status and related home medical equipment research. However, in addition to the physical signs of discomfort, there are other issues that plague older people's quality of life. Therefore, this research suggests that designing a complete home care service to meet the actual needs of customers. To understand the real needs of customers and provide them, in order to obtain customer satisfaction.

This research will focus on home care in Taiwan hospitals. Through the literature collection and analysis to understand the development of Taiwan home care and the status quo. This research uses interview methods, field observations, and panel discussions to assist with two qualitative approaches: the personas and the customer journey map collection information. Identify patient segmentation and needs through personas, identify patient segments and needs with personas, gather data and draw to customer journey maps. Then compare with the sample hospital's current service process touch points to find out where immediate improvements are needed or to develop innovative services. The results of this research are expected to create an optimized service map. Customer oriented as the core, and focus on the implementation details of the service to holistic grasp of the customers service experience.

KEYWORDS  Process Improvement, Double Diamond Design model, Long-term care

INTRODUCTION

Medical technology, birth and death rates are declining year by year, So that the proportion of the world's elderly population increased year by year. The aging society has become a major issue that the government attaches
importance to, and the phenomena and problems arising there from have gradually become apparent. The latest report by the international credit rating agency Moody's predicts that by 2020, there will be 13 countries in the world meeting the standards of the super-aged society (National Development Council. Taiwan. 2016). According to the statistics released by the National Development and Reform Commission of Taiwan's Ministry of the Interior, the population of elderly people in Taiwan surpassed the number of young people for the first time in 2018 (see Fig. 1).

For the first time, the population aging index exceeded 100 to 100.18, and Taiwan officially entered the aged society. According to this estimate Taiwan's future population trends. In 2026, Taiwan as well as Japan become a member of the aged society. This is not only a change in the demographic structure but also affects the structure and quality of the overall medical services. In Taiwan, From the "aging society" into the "aged society" for only about 25 years. Compared with other countries, the timetable has more than doubled. The reference pointed out that the most worried about the elderly in the future to "health" as the primary needs. In line with changes and needs in society, the government provides appropriate services and standards of living and quality for persons with physical and mental disabilities. In 2008, a long-term care 1.0 was introduced to serve the elderly with disabled and dementia seniors. Hoping to improve the negative impact of aging society.

Since the implementation of the long-term care 1.0 (hereafter referred to as LTC 1.0) so far, there have been some achievements but the response is not good. LTC 1.0 less budget, more restrictions, many people do not know this benefit, even being said to be "no-feeling policy". Inadequate human resources, services are not diverse, the quality gap between urban and rural areas and institutions is extremely large, and subsidy lines fail to respond to people's needs and expectations, etc. Lead to long-term 1.0 plan's evaluation is not good. In order to improve the lack of LTC1.0 and face the future trend of society, As well as the establishment of a community-based diverse model. The long-term care 2.0 (hereinafter referred to as LTC 2.0) was born. Its service projects have been greatly

![figure 1. Taiwan population structure change trend (National Development Council. Taiwan. 2016)](image-url)
expanded, streamlining operational procedures, establishing a community service system and proactively promoting LTC 2.0. And increase service personnel.

The whole concept of LTC 2.0 in the establishment of a community-based long-term system, to provide people with affordable and high quality service, Build a long-term care system resource of "Can find, see and use it.". The LTC 2.0 project did improve some of LTC 1.0's insufficient. However, in the LTC 2.0 more than a year of implementation, questioned the budget and the voice of manpower did not diminish. Therefore, it is still an important issue for the government to make LTC 2.0 successful in the coming years (Ministry of Health and Welfare, Taiwan. 2016). From LTC 1.0 and continue with the LTC 2.0 policy until today has been 11 years. In view of the continuing growth of the elderly population, the issue of old-age care has never ceased, and often see some ethical tragedies in society. If the care service does not accurately match the needs of the benefits, then the same thing will still be staged in the future.

Based on this condition, we Cenozoic must actively seek out the issue of elderly care services. These elderly people with disabled and dementia seniors, in addition to medical services, the most important thing is to take long-term care. This indicates whether there is a flaw in the LTC policy and these exploit must be uncovered. In the long-term care system, people attach the highest importance to home-based care (see fig 2). Home care in the past has been mainly focused on the detection of physiological status and related home medical equipment research. However, in addition to the physical signs of discomfort, there are other issues that plague older people's quality of life. In how to improve the quality of service, Heskett et al. (1994) illustrated the value chain. Businesses must focus on maximizing value for employees, customers, investors, suppliers, and other stakeholders. Focus on the value will bring sustained changes in the vitality of the enterprise, focusing on consumer value more able to make the enterprise timely response to rapidly changing market response. Therefore, this research suggests that designing a complete home care service to meet the actual needs of customers. To understand the real needs of customers and provide them, in order to obtain customer satisfaction.

**figure 2. Percentage of Long-term care service item users in past 10 years.**
Based on the above motivation, in this research, we focused on home-based care, and users focused on finding the most appropriate procedures to improve patient's inconvenience, and pointed out the advantages and disadvantages of the long-term care policy. LTC 2.0 implement about one year ago. In service object, service item, and service organization a number of new projects have been added to expand the range of services, so that people who need long-term care services can be more easily used and so on. But LTC 1.0 found problems have been through resolved in LTC 2.0 it? or run in the opposite direction of needs for users, so still need to dig it.

The main purpose of this research is as follows:

1. In-depth interviews with the use of home care object and find out the entire home service process needs to be strengthened and improved. Understand the needs of respondents, thinking and attitudes, with reference to the process according to the comparison of the two viewpoints. Through actual visits, there will be leaps and bounds in the progress of this research.

2. Comprehensive interviews with all samples to improve the problem points in depth discussion, and inquiries on the results of the implementation of many agencies. And based on the findings, pointed out that Taiwan's LTC 2.0 home service defects in the proposed changes and proposals.

3. This research will try to create a map of optimization services. Customer-centric, and focused on service implementation details to holistically understand the users service experience.

LITERATURE REVIEW

In this chapter, we will discuss the related literature on 3 topics.

(1) Home-based Long-term care. (2) Service design. (3) Customer journey mapping and service blueprinting.

Home-based Long-term care

The expert and scholar for long-term care and its related terms, each has a different point of view to define. The following is a more representative description:

Kane & Kane (1986) defined "long-term care" as over a long period of time. Provide a set of long-term care of medical, nursing, personal and social support to Disabilities. Its main target is service object living in the community and institutions to provide long-term series of medical, personal care and social service measures for those with congenital or acquired disability. Its purpose is to promote or maintain physical function in order to enhance the ability of independent normal life.

Halamandaris (1987) discusses long-term care and more clearly defined.

(1) Care objects have varying degrees of damage and disorders, and the extent of damage and disorders vary according to their reasons. Some disabilities unable to take care self and need to rely on others. (2) Different degrees of injury and disorder have their common characteristics, chronic conditions will experience long-term and sustainable development. (3) People with these barriers need others to activities of daily living (ADLs). (4) Many children and those with disabilities of all age groups should be included in the long-term care of object. (5) Includes health care and supportive services. (6) Requires integrated interdisciplinary team service.
Taiwan’s Department of Health defines "long-term care" as a comprehensive and continuous service to long-term caregivers. Its services range from prevention, diagnosis, treatment, rehabilitation, support, maintenance and social services, and clients should not only consider the needs of caregivers but patients themselves.

In Taiwan, long-term care for the development of related policies started in the 1980s. Previously rely on family and civil voluntary service to provide elderly care and long-term care services. At that time, most of them were non-certified organizations and the entire society did not have adequate resources for long-term care. The government is aware of the impact of population aging on the family and society, because of the aging population, advances in medical science and technology, the average life expectancy of the population has increased. Promote the Taiwan government to pay more attention to the elderly and long-term care related policies. And from different administrative systems, research and development planning long-term care policy in Taiwan, in response to the aging population needs. LTC 1.0 implementation, there are still long-term care distribution of resources are uneven.

In order to enhance the service quality of care institutions in order to strengthen resource-poor areas and reward the development of long-term care resources and create a good working environment so as to retain talents (Ministry of Health and Welfare. Taiwan. (2016)).

Home-based care is divided into two categories of nursing home care and family care, the former provides medical care, while the latter provides social care. (Chun, Y. (2016)). Further, nursing home care is a service option for those with long-term care knowledge and technology needs. From home nurse to home provide professional care around the patient's type of service, so that patients can be properly and properly take care of. The purpose is to maintain or restore the health of patients and to minimize their condition. Most of the general services to patients with mobility or bedridden and limited autonomy and ability to act in a stable condition requires a clear medical service. Services to help patients receive positive conditioning and attention at the level of their illness. Apart from the above-mentioned professional medical support services, there is still home-based care that takes care of personal daily living and daily operations. Compared with nursing home care, it focuses on the care of general family care. The purpose is to achieve as much independence as possible in life. And share the burden of family pressure, but also to avoid family members drive in the hard work and danger (Ministry of Health and Welfare. Taiwan. (2007 & 2016)).

On the other hand, home-based care is the mainstay of long-term care. To support the pressure of family caregivers and their responsibilities, and to benefit the disabled who cannot act normally. Apply to take care of attendants home-related life care, for those who need to be able to stay in their familiar home receive consummate care. Can make their family life is not too much change, still maintain the quality and dignity of life, maintaining the balance of mind is also a powerful weapon against disease. However under the LTC 2.0 point out, in the past home-based care was inadequate to meet the needs of all those who were caregivers. Although the amount of subsidy and the inconvenience caused on the pipeline has been planned to improve this disadvantage, it is yet to be confirmed whether there is any real improvement (Ministry of Health and Welfare. Taiwan. (2016)).

Family care is to help share the pressure and responsibility of family members, and to benefit the disabled
who cannot act normally. and Can also apply for attendant to do home-related life care, and can also apply for attendant to do home-related life care. Among them, the largest users of family care. In view of the complexity of the home care, this research explores in-depth consideration of family care.

**Service Design**

Service design is an emerging academic field. Its purpose is to create a complete and meticulous service through the integration of tangible and intangible of media. When used in industries such as retail, banking, transportation, healthcare, etc., many advantages can be created. Practice point of view, service design is to provide users with a complete service as the goal, to plan out the system and process design. This interdisciplinary field must incorporate many design skills, management and processes. Service is something that already exists and has existed in different forms since ancient times. But truly designed services must incorporate new business models that understand the needs of users and create new social values in society. Service design is an indispensable element in knowledge economy (CIID. (2017)).

In the service design steps and process theory. Design council (Design Council. (2005)) had interviewed 11 top companies, and then summed up a set of named "double diamond design process model" (referred to as the 4D method). Divided four distinct phases – Discover, Define, Develop and Deliver. The first phases of the 4Ds covers the start of the project. Designers try to look at the world in other ways, pay attention to interesting things and gather insights. The second phases of the definition phase, designers need to identify the various possibilities and find out which is most important, which part needs to be implemented first, and is feasible, the purpose of this phase is to create a framework of clear goals. The third phase will begin to conceptualize the solution to the target, prototype it, and repeat verification to see if it is feasible or not. In the final phase of 4Ds, completed projects (such as products, environments, services) will be generated or released after repeated testing and verification.

**Customer journey map and service blueprint**

Customer Journey Maps (see fig. 4) can be used to understand the dynamics within the organization and customers, mainly through brainstorming and co-creation. All stakeholders can be aggregated to define the concept of innovative services and to assess both import restrictions and resources in the process. Assist enterprises to establish a macro-structure, to enable enterprises to explore the organization and the customer's purpose. The main use of visual way to present, the purpose is to inspire creativity, start useful conversations and ideas. A constructive dialogue is the key, and a customer journey map provides a new way for stakeholders to work together.

Customer journey map design can be divided into two phases. The first phase is the exploration phase, focusing on the motivation behind the various behaviors of customers and all stakeholders inside and outside the organization. Understand their feelings and stay in the environment before starting to design innovative services that add value. At this stage we draw customer journey maps based on the results of customer insights and qualitative analysis and find answers to the following questions: What do people really want for their goals, how
to do it, in what order, and what are the motivations for making decisions? What is the experience? What is the feeling during the process of achieving the goal?

In the exploration phase, typical activities include quantitative information and qualitative research. In the process, tools such as role prototypes and customer journey maps will be further developed through interaction and feelings with stakeholders and customers. The second phase, the design phase, builds on the results of customer insights and customer journey maps at this stage that are key to service concept design (the concept of innovative services). The service blueprint and service prototype design, its main purpose is through visual presentation, the concept will be expanded and detailed, in order to facilitate the testing to customers and stakeholders, to help businesses explore new opportunities from the customer journey map. Designing "Service Blueprints" with innovative service concepts and providing stakeholder services in order to establish a realistic service system process. After designing the blueprint, the next step is to prototype the service so that all stakeholders can test it with the customer and, based on their feedback, adjust the innovative service plan. Operation of these service prototypes may include a story description card or may be piloted by a new service.

The service blueprint (see fig. 5) is a methodology that addresses issues such as incompleteness, oversimplification, bias, and difficulty in interpretation in service narratives (Shostack, G.L. (1992)). Because the process is the foundation of all services, the function of the service blueprint is to explain and define the content of each process, as well as the connection between the process and the process. The Service Blueprint Approach originated in a number of different areas including the three areas of logistics, decision theory and systems analysis of computer science (Shostack, G.L. (1992)). In the service blueprint, the service system can be divided into three major elements, the first element is the formation of service steps and work content.

The second element is the method and route to perform each task. The third element is the service evidence provided to the customer, that is, the service perception actually obtained by the customer in accepting the service provision (Shostack, G.L. (1987)). A comprehensive and detailed service blueprint provides employees with a clear understanding of the processes involved in each job and a clear understanding of the linkages between the parts they are responsible for and the rest of the service system.

Follow-up scholars to further develop advanced version. The service delivery process in the service blueprint presents the overall architecture of the service by means of a visual graph, similar to the flow chart. View services from a holistic point of view, as a tool for service design and service quality management (Kingman-Brundage, J. (1989)). Some scholars also think that the service blueprint helps to identify the failure points and weak links in the service provision process, so as to improve the service quality. That is, after the service blueprint is completed, managers can view the steps or processes that may go wrong through the entire blueprint, identify and correct the failure point through this method.

Customer journey map is a visual way to show in detail the user contact point in the experience process: including what the user is doing, what he is thinking, and what it feels. The service blueprint is also a form of visualization in more detail, focusing on the points of contact in the service implementation process, including the
service implementation process in the background and in the foreground. Therefore, this research attempts to create an optimized service map that is customer-focused and focused on service implementation details to provide a holistic view of the caregiver's service experience.

**METHODS**

Elderly people (Less than the required level of long-term care, but due to aging or weakness and other factors into the target group) who suffer from chronic degenerative diseases that cause physical activity are inconvenienced and receive long-term care services. However, the disease is unstable and often travels to and from hospitals, resulting in a young population burden. This research hopes to improve service processes and reduce the burden on young people. Methodology Using the 4Ds developed by the Design Council, planning the service design research flow. Generally divided into discover, definition, develop, deliver of four phases. Personas proposed by Cooper in the exploration phase are used to simulate the virtual data of the elderly in the home, and establish the expected service target. Empathy map building interviews, the respondents are long-term care as the management center of the company's customers or applicants. Asked respondents for those services, services, services involved in the process, how the life of a day, through the interviewee's information, organize the needs of respondents, the establishment of customer journey map, according to the performance of the customer on the road map The demand for the final assembly, the final blueprint for the establishment of services (see fig. 6).

![figure 6. Research flow chart](image)

**4Ds design method**

4Ds model provides a service design process, researchers can refer to this theory to improve the service process. With the cycle of divergence and convergence, researchers can find out the needs of customers from a large number of thinking, from the many problems to find the most appropriate solution. During the exploration phase, this research collected the information of target groups by observing the patients / guests who applied for the long-
term case as the management center to set up a persona to meet the research situation.

In the definition phase, the researcher sets up the interview outline by empathy map and collects the user's information by means of situational interview, and uses one-on-one interview. In the process, the interviewer constantly questions the respondents and makes use of what, why and how questions. Collect respondents to apply to experience the experience of home care experience, and through the interview information classification, will meet the research needs of the information summarized as the needs of users. Development Stages Describe user needs based on summarized information, compare and plot customer journey map from each respondent's day's situation. Identify possible pain points in service design and find solutions to these pain points.

In the implementation phase in accordance with the solution to each pain point above, design service processes, and draw a blueprint for service to get a new service process.

**Interview process**

In this research, researching the elderly living at family care, who fail to meet the needs of long-term care required, but due to aging or weakness and other factors, be included in the target group. So researchers are more able to interview the way to obtain detailed information. The interviewees were patients or guests of the long-term care management service center. By the interview process by the time and venue restrictions. Therefore, this research adopted a convenient sampling method, using easily accessible guest and service staff as interview samples and searching for the next interviewees by means of samples to collect data. Use the importance of the number of less than appropriate (Denzin & Lincoln. (1994)), and the number of samples proposed is at least 20 (Reynolds, T.J. and Olson, J.C. (2001)). Therefore, this research refers to the interview sample number of relevant literature recommendations, is expected to select 20 eligible respondents.

This research establishes a persona for home care service through long-term care management center through user observation. Follow the six directions of seeing, hearing, saying, doing, thinking, feeling of the empathy map to think about how the respondents feel and the what, why, how of the contextual interviews. Question What do I see when I apply for home care services? Why? How? To collect information about the interview.

**Data analysis method**

1. **Build the interviewer persona:** Through the user observation application for the long-distance management center of the patient/guest, collect target group information, set a persona.
2. **Initial build of service process:** Establish initial service process based on the existing knowledge of data and services.
3. **To collect interview data:** to conduct a situational interview with the elderly who apply for long-term care management center in combination with the persona of research design. The interview outline refers to the thinking mode of empathy map and contextual interviews and asks respondents.
4. **Analysis of the interview:** This research will find out the content of the interview service touch point list the interviewer for the personal care services come into contact with the personnel and time services. Analysis of service touch point is to find out the service is not doing well.
enough place, and propose ways to improve service to be improved. (5) Establishing a Customer Journey Map: The Customer Journey Map (Stickdorn et al. (2011)) is a real-life story of user experience using the touch point between customer and service as the "journey". By analyzing each service touch point, and according to the respondents' service history, it can clearly depict the links of each service and construct the customer journey map.

(6) Establish a service blueprint: This stage depicts each service link according to the above customer journey map. Find the service pain points and make improvements to the service link, respectively, for the service before, servicing, and after the service, three phase of drawing a service blueprint. before service focus on looking for suitable guests, the servicing is expected to improve the overall service experience and smooth, after the service guests can come home again for the evaluation of service results.

**EXPECTED OUTCOME**

The research will take the cases of family care taken by the hospitals in Taiwan as subjects. Through literature collection and analysis to understand the development and current situation of home care in Taiwan. Uses interview methods, field observations, and panel discussions to assist with two qualitative approaches, the personas and the customer journey map collection information. Compare with the current touch point of the service process in the sample hospital, so as to find out the immediate improvement or develop innovative service. The results of this research are expected to create an optimized service map that is customer oriented and focused on service implementation details to provide a holistic view of the user service experience.

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