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Narratives of Love

爱的阐释

Narratives of Love
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Designing Healthcare Services for Longevity

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Abstract

Adults 85+ years and older have become the fastest growing global population, representing a new paradigm of longevity economics, service innovation, and experience-driven business. In summer 2023, the authors conducted a study to identify longevity-related challenges and frame questions in the context of healthcare services. The two-month study, which consisted in the planning and implementation of a 3-hour co-creation workshop to explore longevity-related needs of healthcare services and 1 post-workshop survey to capture insights, was a collaboration between an academic research institute in the US and a government-level design research center in Asia. The research proposes a new framework to assist in a longevity-informed design process: the 4Es (ensure, evolve, empower, and enjoy) framework. This framework is based on 35 expert interviews (Lee, Coughlin, et al., 2023), from which we derived 12 keywords associated with longevity and aging: health, family, mobility, care, home, communication, trust, community, risk, investment, education, and future. We applied the framework in the creation of an ideation toolkit for the co-creation workshop, consisting of 12 Design for Longevity (D4L) cards and 4 participatory posters. We recruited 27 participants from the healthcare industry, including three categories: 1) healthcare service providers, such as doctors, nurses, and pharmaceutical leadership teams, 2) healthcare service recipients, such as patients and their families, and 3) workshop facilitators including UX and UI designers. Overall, the study was beneficial to healthcare services for longevity. Two key learnings are demonstrated from the study: 1) By providing a series of accessible verb-based questions, the 4Es framework helped facilitate conversation and ideation among diverse participants and 2) Touching and sharing the D4L cards and posters enabled participants to discuss abstract concepts and complicated topics more easily.

Keywords

Design for longevity; service design; healthcare; design process; longevity economics

Introduction

Most developed countries are already in a stage of a super-aging society (World Health Organization, 2022). Our society is transforming to adapt to multi-generational and inter-generational cultures, workforces, and other environments. Due to established economic structures, advancing technologies, better education and medical systems, and stable social infrastructures, people can live longer and want to live healthier to maintain a good quality of life. As a result, the demands of longevity economics have led to a paradigm shift, especially service- and experience-driven business strategies. Consequently, an interest in designing healthcare services for longevity has emerged across various industries and academia. Our project was a 2-month multi-disciplinary research initiative among data scientists, an industrial designer, and interaction designers from Massachusetts Institute of Technology (MIT) AgeLab, Northeastern University College of Arts, Media, and Design (CAMD), and Taiwan Design Research Institute (TDRI), a government-level organization that promotes design for social impact and service innovation. Our goal was to identify critical research questions concerning healthcare services for longevity by using the proposed keywords and 4Es (ensure, evolve, empower, and enjoy) framework applied in 12 Design for Longevity (D4L) cards and 4 participatory posters (figure 1). We recruited 27 participants, including healthcare service providers (doctors, nurses, and pharmaceutical leadership) and service recipients (users and their family members), conducted a 3-hour co-creation workshop, and designed a post-workshop survey to capture participant's reactions and responses.

Figure 1. Original poster design paired with 12 D4L cards from co-creation workshop.

Literature reviews and case studies

Longevity economics

In the era of an aging society and the fourth industrial revolution (Schwab, 2016), our economic structure has shifted dramatically from a product-centered model and mass-production focus to a more service- and experience-driven approach that considers longevity and sustainability. Golden (2022) notes that our society has changed from the traditional 3 stages (born, earn, and retire) to multiple stages, and this change directly affects our social infrastructure systems. Golden's five-quarter (5Q) framework demonstrates that people's age represents not only several years, but also—implicitly and explicitly—a life stage. Coughlin (2019; 2017) proposed the 8,000-day framework, which looks at the expected 8,000 days of retirement as "four

retirements": manage ambiguity, make big decisions, manage complexity, and live solo. By centering the 4 retirements, longevity economics can influence how we rebuild and shape healthcare services for future AgeTech cities, where human aspects and emotions are integrated into making critical decisions and cultivating sustainable behavior and mindsets (Etkin, 2021).

Design for Longevity (D4L)

Design for Longevity (D4L) has been an emerging idea that influences us not only financially and economically but also technically and socially. Since we are in a multigenerational environment, people have started to focus on agism issues across many industries and organizations, including education, culture, and policies. Customers have become more sophisticated as their needs have changed (Lee, et al., 2023). Instead of manufacturing more products, in the context of D4L, we need to consider more service-oriented experiences that tie to the desirability of people and social impact (Lee, et al., 2023). For example, MIT AgeLab proposed a D4L studio to envision longevity services and journeys to shift the roles and responsibilities of financial advisors to those of longevity coaches (Lee, Coughlin, et al., 2023). D4L is a cross-disciplinary domain that has academic value and industrial potential to be applied in many arenas, including healthcare. In this study, we applied the frameworks developed as part of the D4L studio to conduct an experiment on healthcare services.

Research methods and 4Es framework

The 2-month research project included four key steps: scope the research area, design applied assets for the 4Es framework, conduct a co-creation workshop, have participants complete a survey, and analyze survey data (Figure 2). Step 1 included research into challenges related to longevity and consisted of 35 expert interviews (Lee, Coughlin, et al., 2023). Interviews were analyzed using ATLAS.ti, a computer-assisted qualitative data analysis software, to come up with 12 keywords and the 4E framework. In step 2, authors developed a toolkit to be used in the workshop: the D4L cards, 4 participatory posters, and a survey to document participants' backgrounds, demographic information, and perceptions of longevity and service design, including the relevancy of the keywords in the healthcare sector. Step 3 involved conducting the 3-hour workshop, which concluded with participants filling out the survey. And in the final step, we analyzed the survey results.

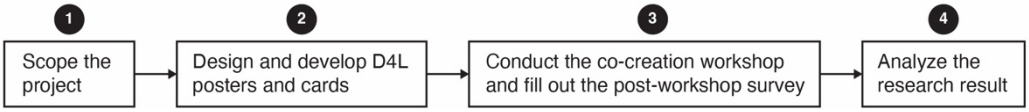

Figure 2. The research process consists of four steps.

We recruited 27 participants from three expertise areas: healthcare service providers, healthcare service recipients, and workshop facilitators with expertise in design. Doctors (n=2), nurses (n=3), and pharmaceutical leadership (n=7) are defined as healthcare service providers. Users (n=7) and their families (n=4) belong to healthcare service recipients. The rest of the participants and designers are included as facilitators (n=4). Participants were grouped into 6 diverse teams.

Figure 3. The 4 posters are used to identify research questions in healthcare services for longevity.

The posters (Figure 3) were created to emulate the design process: 1) **Define audience:** Who is your D4L persona? Participants used this poster to create a persona. 2) **Clarify objectives:** What values are relevant to D4L? Participants ranked keywords by importance in relation to their persona. 3) **Identify design opportunities:** When and where can D4L integrate with healthcare services? Participants used the four probing questions from the 4Es framework to brainstorm healthcare services for their persona. 4) **Visualize concepts:** Why does longevity matter to healthcare services? On this board, participants storyboarded their final idea. Throughout the workshop, participants used the 12 D4L cards as a supporting tool to enable them to have more constructive, meaningful, and engaging discussion (Figure 4).

Figure 4. The 12 D4L cards combined with 4 posters help explore healthcare services for longevity.

The 4Es framework is a tool to help people brainstorm concepts and ideas for products, platforms, and services that address issues of longevity. There are four stages to the framework: ensure, evolve, empower, and enjoy. Each stage offers a question to guide participants to think more dimensionally about the challenges and opportunities of longevity. (Table 1).

Table 1. The 4Es framework explanation, guiding questions, keywords, and examples.

4Es	**Ensure**	**Evolve**	**Empower**	**Enjoy**
Explanation	Foundation	Transformation	Extension	Outcome
Guiding questions	What do you need to **ensure**? What is basic to your future wellbeing?	What needs to **evolve** with you? What transforms with you over time?	What can **empower** you? How can you extend your impact?	What do you **enjoy**? What outcomes do you benefit from?
Associated Keywords	*Mobility, Home, Community*	*Education, Health, Family*	*Future, Investment, Risk*	*Trust, Care, Communication*
Examples	***Mobility*** is imperative for an independent lifestyle. The design of automotive safety features can ensure mobility into later ages.	***Education*** services need to accommodate changing social and professional needs and be relevant and stimulating to seniors.	Designed systems need to minimize ***risk*** and help people's daily behavior make positive social impact.	Products and platforms that allow us to demonstrate ***care*** for each other and the environment.

The workshop ended with a 5-minute presentation from each group to share their 1) D4L persona, 2) D4L-relevant values, 3) D4L-integrated healthcare services, and 4) their expanded understanding of longevity. Most teams were interested in exploring long-term healthcare services such as coming up with human-centered approaches to take care of dialysis patients or people with diabetes. Figure 5 demonstrates a participant using the 4 posters, combined with 12 D4L cards, as an effective inspirational tool to develop and communicate their scenario.

Figure 5. Participants used 4 posters to facilitate the discussion about healthcare services for longevity.

Research result

Analysis of D4L cards and keywords

One of our research goals was to determine if the 12 keywords, visuals, and proactive questions on each of the D4L cards were relevant to longevity concerns in healthcare, as well as if the set itself could serve as a conversation facilitation tool. As part of our survey, we asked participants to rank the keywords from 1 to 10 based on their importance in the context of longevity. The ranking result from top to bottom showed (the value in parentheses is the average number, n=25): health (1.48), family (3.68), mobility (5.04), care (5.16),

home (5.44), communication (6.4), trust (6.92), community (7.6), risk (8.4), investment (8.92), education (9.04), and future (10). Unsurprisingly, aligning with the participants' backgrounds, health was the most important factor. Family was second, followed closely by mobility, care, and home. Interestingly, the more abstract words, like future and investment, were ranked lowest. Participants also contributed other keywords—happiness, financial wellbeing, physiological and psychological health, meaningful and delightful lifestyle, companionship, sharing, learning, active, and being alone— to help co-build the D4L cards' content.

Analysis of co-creation workshop experience

The following survey results (n=27) can help us not only better future design workshops, but also receive feedback on D4L cards and posters. Overall, more than half of the participants (88.9%) were satisfied with the co-creation workshop experience. This workshop and discussion helped most participants (83.1%) paint a picture of what a healthy lifestyle looks like and helped the majority of participants (92.5%) understand the importance of considering needs from multiple dimensions and how to use a design process to envision future scenarios (88.9%). Most importantly, it helped most of them (85.2%) identify innovation opportunities from different aspects. Figure 6 demonstrates that 4 posters combined with 12 D4L cards are effective and useful tools for most (77.7%) participants.

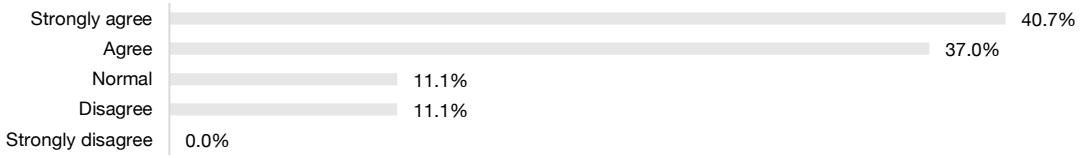

Figure 6. Results from 27 participants to survey question, "Using 4 posters with 12 D4L cards unlocked my creative thinking during the team discussion and enhanced the level of comprehensiveness of the topics."

Discussion and next step

Complexities of the term "longevity"

From the in-person workshop observation and post-workshop survey, we found that perceptions of longevity varied among participants. This could be because of different East-West cultural interpretations of the term "longevity", or due to experiential differences between healthcare service providers, healthcare service recipients, and workshop facilitators. It could also be because concepts of longevity and D4L are still relevantly new, with limited exposure in the field of service design and social innovation. Therefore, as demographic trends continue to shift, it is critical to continue to develop design methods around longevity within healthcare and beyond.

Future uses for a longevity toolkit and co-creation workshop

With the success of applying the 4Es framework and D4L cards in this study, what are other research areas that could benefit from a similar longevity workshop? We are considering public transportation systems, corporate organizational structures, educational services, AI-relevant ethical issues, and other complicated and systemic socio-technological challenges. As a next step, the 4Es framework and D4L cards can be considered as experimental materials. We aim to extend the applications of both by applying them to various research areas to build a more comprehensive and impactful toolkit for longevity and service design.

Conclusion

The development of Design for Longevity (D4L) tools for healthcare service design

The purpose of the workshop was to explore longevity-related challenges in healthcare services. We created the posters and D4L cards, based on the 4Es framework, to facilitate conversation and ideation. We tested these artifacts in the co-creation workshop to help participants (doctors, nurses, users, and designers) brainstorm and identify untapped opportunities for the redesign of healthcare services across levels of individuals, communities, and countries. Having synthesized the data captured from the survey result, poster information, and observation notes, we demonstrated that the 4Es framework, posters, and D4L cards foster open-ended conversations concerning complicated, private, sensitive, and challenging healthcare services. This is because the 4Es framework was designed with 4 relatable questions to inspire participants to quickly build mind-maps related to longevity. And the physical artifacts—the posters and cards—were designed to make abstract or complex concepts tangible, and therefore easier to work with. We concluded that the 4Es framework, posters, and D4L cards, raised participants' curiosity, enhanced their engagement level, and enabled them to have constructive discussions around healthcare services even though they were from very diverse backgrounds.

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References

Coughlin, J. F. (2017). *The Longevity Economy: Unlocking the World's Fastest-Growing, Most Misunderstood Market* (First edition). PublicAffairs.

Coughlin, J. F. (2019). Planning for 8,000 Days of Retirement: Advisor Value in Today's Longevity Economy. *Investments & Wealth Institute*.

Etkin, K. (2021). *The AgeTech Revolution: A Book about the Intersection of Aging and Technology*. New Degree Press.

Golden, S. (2022). *Stage (Not Age): How to Understand and Serve People Over 60--the Fastest Growing, Most Dynamic Market in the World*. Harvard Business Review Press.

Lee, S.-H., Coughlin, J. F., Yang, M. C., Balmuth, A., de Weck, O., & Ochsendorf, J. (2023, August 22). *Design Artifacts and Gaming Transform Financial Planning Services: Multifaceted Experimental Design Research*. International Design Conference (IDC) and IDSA Education Symposium. https://www.internationaldesignconference.com/

Lee, S.-H., Coughlin, J. F., Yang, M., de Weck, O. L., Lee, C., Klopfer, E., & Ochsendorf, J. (2023). Co-create Financial Planning Services for an Aging Population: Designers' Perspectives. *Proceedings of the Design Society*, *3*, 947–956. https://doi.org/10.1017/pds.2023.95

Lee, S.-H., Yang, M. C., de Weck, O. L., Lee, C., Coughlin, J. F., & Klopfer, E. (2023). Macro-Trend Study Under Service System: Preliminary Research in Service Innovation and Emerging Technology. In U. Z. A. Hamid & M. Suoheimo (Eds.), *Service Design for Emerging Technologies Product Development* (Vol. 29, pp. 45–72). Springer International Publishing. https://doi.org/10.1007/978-3-031-29306-1_4

Lee, S.-H., Yang, M., de Weck, O. L., Lee, C., Coughlin, J. F., Klopfer, E., & Ochsendorf, J. (2023). Service Design in Action: Transformation, Consideration, and System Thinking. *Proceedings of the Design Society*, *3*, 3145–3154. https://doi.org/10.1017/pds.2023.315

Schwab, K. (2016). *The Fourth Industrial Revolution* (First U.S. edition). Crown Business.

World Health Organization. (2022, October 1). *Ageing and health*. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health