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LAB 4 LIVING

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Transforming healthcare through design-led innovation

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Abstract
The changing demographic across Scotland poses major challenges for the healthcare service (Scottish Government, 2010). The ageing population and rise in long-term chronic conditions are placing greater demands and increasing pressure on service providers (Scottish Government, 2011). As a result, there is a need to consider alternative strategies for healthcare delivery in an attempt to overcome these challenges.

Scotland has a new innovation centre which aims to respond to the challenges facing the healthcare system by transforming health and social care delivery (www.dhi-scotland.com). Experience Laboratories are at the core of this model of innovation and are led and developed by the Institute of Design Innovation.

Experience labs are an innovative method for trialling and testing new solutions for health and social care and provide a new way of working collaboratively within this context. Within the Experience Lab there is an opportunity for extreme collaboration between academics, business and civic partners to co-create and co-design sustainable solutions together with end-users. The Experience Lab provides a safe, collaborative environment which replicates real life practice within which to trial ideas and engage in design-led activities. These activities open up, and place the user at the centre of the design process.

This paper will illustrate the Experience Lab through a case study of a project which explored and developed a new concept system for assisted living to support and empower older adults to live independently at home for longer. The Experience Labs provided the opportunity to user-test the initial concept by developing and validating a solution with users. The design-led approach aimed to deliver requirements for the system that were firmly user driven. The Labs provided a safe and realistic environment through which the Lab team helped users explore the concept and share their feedback and ideas for improvement through activities including experience interviewing, workshops and role-play.

Keywords: design innovation, healthcare

Introduction

The changing demographic across Scotland poses major challenges for the healthcare service (Scottish Government, 2010). As a result, there is a need to consider alternative strategies for healthcare delivery in an attempt to overcome the challenges of an ageing population and rise in long-term chronic conditions (Scottish Government, 2011).

The Digital Health Institute (DHI) is an Innovation Centre, which aims to respond to the challenges facing the healthcare system by transforming health and social care delivery. The DHI aims to generate innovative and sustainable solutions across health and social care.

Experience Labs

A core aspect of the DHI is the concept of the Experience Lab, which is developed and led by the Institute of Design Innovation at The Glasgow School of Art. Experience Labs are not a new concept but are a new way of working collaboratively within the health and social care context in Scotland. Experience Labs provides the opportunity for extreme collaboration in a safe and flexible environment where academics, business and civic partners can co-create and co-design sustainable solutions together with end-users. The inclusion of end-users is crucial to the success of the innovation in order to develop solutions that match their needs and preferences (Kline and Rosenberg, 1986).

The research approach within the Experience Labs is design-led and driven by design methodologies. The safe, collaborative environment of the Lab replicates real life practice where rapid cycles of experience can trial ideas and allow collaborators to engage in activities with a multidisciplinary team of experts in design innovation. The activities position the user at the centre of the design process and largely involve observation, brainstorming and prototyping of ideas. The use of prototyping to trial ideas enables the progression of thinking and ideas through physical making; a safe space for failure leading to faster learning; and encouragement and permission to explore new behaviours (Coughlan *et al*, 2007). The trialling of ideas can begin with paper prototyping and gradually lead to experimentation with a functional prototype. This involves an iterative process of several cycles where ideas are reviewed, adapted and refined (Swann, 2002). In this way, the term laboratory does not reflect the traditional use of the term in relation to science. Instead, the experimental nature of the Experience Lab relates to this trialling of new ideas and prototypes leading to user-driven solutions.

Experience Labs open up the design process to encourage creativity, and allows users to experience digital technologies as well as gather deep insights on their experience, behaviours and attitudes. Similar to Participatory Action Research, Experience Labs are an emergent process that cannot be predetermined (Reason and Bradbury, 2013). The Lab changes and develops as those engaged deepen their understanding of needs. The Labs provide the opportunity for

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collaborative relationships to develop and open the opportunity for new communicative spaces and experiential learning (Reason and Bradbury, 2013).

Experience Labs employ an asset-based approach to transforming health and social care by empowering participants through providing designed tools within the Lab to allow participants to create opportunities to fulfil needs rather than focussing upon deficits. This is in contrast to a deficit model which appears to reflect the traditional biomedical approach to health by focussing on identifying what is 'lacking' and what needs to be 'fixed', leading to a reliance upon services rather than individuals becoming active agents in their own health (Morgan and Ziglio, 2007; Foot and Hopkins, 2010).

Case study: Experience Labs for assisted living

The Scottish Government estimate an increase of 60% in those aged 75 years and over living in Scotland by the year 2033 (Scottish Government, 2011) leading to greater demands on health and social care services. There is potential for products and services that cater to this market to relieve the pressure on public services.

To illustrate the Experience Lab we present a case study of a project, which explored a new concept for assisted living to support and empower older adults to live independently at home for longer. In order to protect the commercial interests of the project partners we will not detail the concept being tested, but will share the methods and the high level insights which were uncovered.

A series of Experience Labs were designed to explore the full potential of the proposed system and user-test the initial hypotheses behind the concept by developing and validating a refined solution with users. The design-led approach aimed to deliver a set of requirements that were firmly user driven. The Labs provided a safe and realistic environment through which the Lab team helped users explore the concept and share their ideas for improvement.

Experience Lab Participants

Six older adults (aged 75 to 85 years) volunteered to take part in the project and were invited to bring a family member or friend to accompany them. The project was designed in collaboration with a commercial partner. An academic partner specialising in Occupational Therapy was invited to observe and review the third Lab.

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Lab 1: A day in the home

Figure 1: Experience Lab one experience interviewing and guided tour.

The aim of the first Experience Lab was to understand the ageing user, their home life and routines allowing exploration of key themes including: aesthetics of the home (including products), quality of living - aspirations for the future, daily routines and interface design.

The Lab involved researchers visiting end users in their own living environment to conduct experience interviews around the key themes in a real life context. The context for the Lab also allowed discussion to happen in situ where any actions could be observed rather than recalled. Participants were invited to give the researchers a guided tour of their home and products in order to further understand the living environment and contextualise the key themes. The Lab concluded with testing of digital interfaces similar to the proposed system to generate insights around preferences and familiarity.

Lab 1: Findings

The findings were analysed using thematic analysis, a technique which allows for the identification of repeated patterns of meaning, captured in 'themes' (Braun and Clarke, 2006). Thematic analysis was chosen because of its flexibility and compatibility with various theoretical paradigms and frameworks. Analysis of the interview transcripts revealed the following key themes:

Many participants described **personal challenges** that they had experienced, related to their personal living circumstances. These challenges included tasks that participants were unable to do anymore, the need to downsize and make living more manageable e.g. reducing heating bills by only heating rooms required etc., and the importance of making good buying decisions. Other participants described tasks and situations in which they anticipated themselves requiring help with in the future.

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> "I'm beginning to find it quite heavy. I had a home help because I had an operation and I used to think it's an easy job she's doing, she's just wandering around with the hoover which I thought was nothing but it's quite hard now, I've discovered. It's one of the surprising things that happened."

Participants frequently described the **personal adaptations** they devised to make everyday tasks easier. Many participants described using products or other gadgets they had adapted to make everyday tasks easier and more manageable, particularly the use of microwaves and slow cookers.

> "I've got an electric cooker but otherwise I quite often use the microwave, I cook up a pound of mince and that lasts me about half the week!"

Participants described **networks of support** for everyday life which varied depending upon personal circumstance. For married participants, there was a sense of teamwork between spouses through sharing of daily tasks and activities and reminding each other of diary dates. Participants who lived alone described learning new skills after the loss of a partner and situations where help was needed when something went wrong. Participants also described the support they gained from family, and members of the community who they could call upon if they needed help.

> "Going to hospital my daughter will take me up. But generally we help each other, the neighbours round here and my friends… they're ever so good."

The theme of **technology and products** included the technology usage and ability of participants, the influence of others in the participant's use of technology, confidence in using technology, and the reasons for buying new technology and products.

Some participants used technology frequently in everyday life and had mobiles, laptops and other devices that they felt confident in using. Others had little or no contact with technology in terms of using internet-enabled or mobile devices. These participants were aware of technology but did not feel they needed it or did not feel confident enough to use it.

There was also an interesting relationship between those participants who were seeing others regularly use technology and then going out and seeking this technology for themselves. Many participants spoke of the influence of others in using technology or buying devices.

> "Oh, it's terrific (Skype). I've a brother in (country name) and my sister-in-law keeps saying, 'Have you got that laptop yet?'…They've been harping on at me for about four or five years to get something."

Where possible, participants tended to repair products rather than replace. New products were only purchased when convinced of a real need, giving participants the justification to buy.

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At the end of the interviews, participants were shown images of interfaces similar to the proposed system. Participants reported a preference for interfaces that were clear and uncluttered, and icons with accompanying text.

Lab 2: A trip to a department store

Figure 2: Experience Lab two guided shopping experience.

The aim of the second Lab was to invite participants to interact with technology and home products whilst exploring key themes including: aesthetics of homeware and technology products, functionality and usage of products, and aspirations for the home and for quality of living.

The Lab involved a field trip to a department store to undertake a personalised guided shopping experience designed and led by the Lab team, which included product demonstration and testing. This setting provided access to home and technology departments and a mix of brands, in a retail environment.

Figure 3: Experience Lab two scenario cards and focus group.

Finally a focus group was held, where participants were invited to share their experiences and insights from the day and also asked to prioritise scenarios where the proposed system would be

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beneficial. These scenarios were informed by the insights gained from Lab one. Scenarios were illustrated and printed on cards and participants voted for their top three. This ensured that the scenarios tested in Lab three were user-driven.

Lab 2: Findings

Thematic analysis was applied to the transcripts of the guided shopping experiences and focus group, which revealed the following key themes:

Participants' **buying decisions** were based on a variety of factors including: value for money, functionality, aesthetic fit within the home, brands and importance of aftercare service.

As uncovered in Lab one, participants' buying decisions were very much dependent on the functionality of the product, particularly in relation to the need and purpose that the product would serve. Insights also revealed that participants would only purchase products that they perceived value for money.

Buying decisions were influenced by word of mouth for many participants, and all participants would consult a family member or friend before purchasing a product. Often that person may purchase it on their behalf or may go with them to help select the product.

> "I'm getting a laptop… But I don't know which one to get so my daughter is up on it so she's coming to hold my hand."

Many participants described the need for products to fit within the home and commented that they would not purchase certain products as they may look out of place. Participants also commented on certain brands they preferred that had a trusted reputation.

Insights into preferred **technology interfaces** revealed a consensus among participants for an uncluttered interface, colour coding and consistency with other products in the home.

> "…you need something that you can pick up, with colour-coded buttons large enough to see, bright enough that you can distinguish the colours and then there's a line of continuity…"

As in Lab one, the theme of **anticipating old age** also recurred frequently. Participants spoke of choosing products that would make their everyday tasks easier. The size and weight of products were also important factors for participants as they considered what would be manageable for them.

Lab 3: The future home

Experience Lab three aimed to test the concept for the proposed system. Prior to Lab three, the Lab team collaborated with the commercial partners to design the prototype and scenarios to be

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tested. The Lab team built a non-functioning prototype operated by a member of the team to give participants the impression that the system was fully functional. This enabled testing and gained feedback on the concept in a realistic environment without the time and cost required to build a working system.

The Lab involved experience testing of the prototype through role-play scenarios. This method of testing provided the opportunity to observe participants' actions and reactions to the prototype. A mock home setting provided a realistic context to test the prototype using the scenarios selected in Lab two.

Figure 4: Experience Lab three role-play.

A facilitator worked with the participant to introduce the prototype, act out the scenario and ask questions. A camera transmitted a live video and audio of the role-play to the control room for the wider team to observe.

The Lab also explored how the prototype system could be linked to a family member or carer who may look after the well being of the primary user remotely, and thus examined the potential secondary use by the carer.

After the participants had completed the home and carer role-plays, they were invited to spend some time in the workshop space, which offered the opportunity to explore and visualise ideas using playful materials such as clay, puppets and an electronics sensor/actuator toolkit, which allowed them to describe a scenario in which they would anticipate using the proposed system.

The Lab concluded with a focus group, where participants discussed their impressions of the system together. This provided the opportunity to gain feedback on the concept overall, and ask specific questions raised by the commercial partner.

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Figure 5: Experience Lab three focus group.

Lab 3: Findings

The findings were informed by field notes from the role-play scenarios (participant and carer), workshop and focus group, and provided design recommendations on the aspects of the system that were tested. There was positive feedback on the proposed concept and key insights were gained on functionality, usage, set up and price. Participants highlighted the importance of personalising the system to make it relevant to each user, the level of support they require and their home.

Overall findings

Personalisation was a key theme throughout the Labs and had important implications for the system given that user circumstances varied in terms of home environment, networks of support, and comfort with technology.

The findings revealed that participants are already adapting to personal challenges and making everyday life easier using both low and hi-tech solutions. In addition, participants talked about ageing and anticipated requiring additional support, suggesting that the system could be progressive and grow with the needs of the user, potentially leading to a younger target market.

The Labs revealed that value for money is a crucial part of the decision to purchase, as participants tended to repair not replace where possible, and only purchased products that fulfilled a clear need. Buying decisions were also strongly influenced by others, leading to important marketing implications for the system.

Conclusions

The Experience Labs provided opportunities for extreme collaboration between academics, business and end-users, to co-design a sustainable assisted living concept, which aims to enable people to be independent in their own home for longer. Through a rapid cycle of insight generation and prototyping, the Lab team were able to rapidly develop and test a system that could offer a person-centred alternative to traditional health and care delivery.

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The case study demonstrates a successful application of the Experience Lab methodology, highlighting the benefits of rapid concept development and trialling, person-centred requirement generation, and facilitation of multidisciplinary working with businesses and end-users.

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