DESIGN4 HEALTH

Extract of the
**Proceedings of the 3rd European
Conference on Design4Health**
Sheffield 13-16th July 2015

Sheffield Hallam University | Art and Design Research Centre

LAB 4 LIVING

YORKSHIRE & HUMBER ACADEMIC HEALTH SCIENCE NETWORK

Designing New Healthcare Experiences: prototyping a physical space that enables a design approach to improving patient experiences in hospital

Stephen D. Reay[1], Guy Collier[1], Amanda Bill[1], Justin Kennedy-Good[2], Andrew Old[2]

[1]Auckland University of Technology, NZ

[2]Auckland District Health Board, NZ

Abstract

The Design for Health and Wellbeing (DHW) Lab is a collaboration between the Auckland District Health Board (ADHB) and the Auckland University of Technology (AUT)'s Faculty of Design and Creative Technologies. Located inside Auckland City Hospital, the Lab combines the design-led research and teaching activity of a university with a hospital's commitment to exploring innovative solutions to complex healthcare issues. This unique collaboration aims to develop creative and responsive design-led solutions to health environments, while providing real-world opportunities to advance both applied and theoretical research into how design can be integrated within healthcare environments. Fundamental to this approach is user-centred design in which patients, families and staff are part of the interdisciplinary, collaborative design process so that the value of the design reflects 'real' needs rather than 'assumed' needs.

In this paper we focus on establishing and prototyping the physical environment of the DHW Lab. We show how ongoing collaboration within the DHW Lab is facilitated by the physical qualities of the space itself—open, dynamic, experimental—which encourage visitor participation in a 'knowledge ecosystem'. We explore the synergies between design and healthcare organisations and illustrate how locating practice in context helps facilitate collective understandings and foster innovative approaches to working across traditional boundaries. Finally we reflect on the importance of the space in encouraging the role of design inside the hospital, and present some of the key challenges and opportunities when designing a new environment that sits between two very different organisations.

Keywords: Interdisciplinary, prototyping, space, collaboration, co-design

Introduction

The public sector has in recent decades embraced a growing number of initiatives that aim to address complex societal needs and challenges through what is broadly called 'innovation'. Many of these initiatives take the form of a 'social lab'—a collaborative platform committed to the growth of social innovation through inquiry, analysis, and rapid experimentation. The issues to which these social labs attend are often extremely ambitious. Some, like SociaLab based in Chile, look at ways of alleviating poverty, while others, such as those affiliated with the organisation *Reos*, focus on global food sustainability, climate change, community resilience, and state collapse (Hassan, 2014:15).

So-called 'Living Labs', a variation of this movement in social innovation, emerged in Europe around 2005 and refer to a network of small public-private partnerships which are characterised by user involvement and real life experimentation (Almirall & Wareham, 2008). These, too, are fundamentally collaborative spaces that deal with what Buchanan (1992) might call 'Wicked Problems'. The participatory framework in the resolution of these problems can be likened to the orientation of co-design practices in which a variety of skillsets and expertise—of both designers and end-users—become integrated into a 'knowledge ecosystem'. For instance, in their study of the cultural production of innovation within the industry of design consultancy, economic geographers Sunley *et al*, (2008) show how "design innovation involves a complex blending of many different forms of knowledge, [and therefore] requires us to understand a set of connections between sites and domains," (2008:678).

This understanding of design as a collaborative process—that is, engaging with stakeholders and end-users to meet their needs—is by no means new. What is new is that it is increasingly associated with social innovation, and some scholars have even suggested that many policy makers and politicians are beginning to see co-creation and co-production as *necessary* to innovative solutions (Voorberg *et al*, 2014). Co-creation, especially in social services, is

> "…powerful [because of] the complexity of the stakeholder network. Unlike business initiatives, where we often find a single decision maker, social services projects generally involve multiple decision makers, each of whom must support a proposed solution. Enlisting them in the design of solutions is both effective and efficient" (Liedtka, King, & Bennet, 2013:149).

Importantly, Murray *et al* (2010) recognise the social significance of refining and testing ideas through prototyping, particularly with respect to the ways in which prototypes contribute to social innovation. This is because, they write, "it's through iteration, and trial and error, that coalitions gather strength (for example, linking users to professionals) and conflicts are resolved (including battles with entrenched interests)" (Murray *et al*, 2010:12). For these reasons, we argue that spaces for design prototyping contribute to the development of hybrid organizational forms that can

bridge institutional fields and help to resolve conflicting institutional logics (Doherty, Haugh, & Lyon, 2014: 418).

This paper describes a partnership between a healthcare organisation and a university design school, initiated to explore how a 'social lab' as a conceptual idea might be implemented inside a hospital with the broad aim of understanding how design might improve healthcare. We describe how we prototyped both a relationship and a physical space over a three-year period, and present some learnings and opportunities for the future. We argue, following Sanders and Westerlund (2011), that the physical co-design space improves and facilitates creative input from (and collaboration between) students, visitors, hospital staff, and stakeholders with an aim to produce innovative solutions to real healthcare issues.

Early stages

Prior to developing a partnership with the ADHB, a number of product design students had undertaken a range of healthcare-related major projects, both in their undergraduate and postgraduate studies (Reay & Withell 2013). These were often undertaken in collaboration with external (to AUT) organisations in an attempt to provide a more relevant learning experience for students, and to better prepare them for the type of real-world projects they might encounter post university (Reay & Withell 2013). Through these projects students were introduced to transdisciplinary collaboration with the aim of enhancing engagement in the projects by the students. This learning approach was focused around three core themes, which also form the fundamental underpinning of the DHW Lab student activities currently undertaken:

(1) Transferable skills – 'design thinking' was identified as a valuable package of processes, methods and mindset that is gaining popularity outside of the design discipline;

(2) Values – sustainability was identified as a core area to allow students to explore their own values and role as a designer; and

(3) Expertise – situating students in projects with industry partners outside design provides students with an opportunity to practice and reflect on their expertise with groups who may not have previous design experience (Reay & Withell 2013).

Towards a partnership

In October 2012, the ADHB and AUT's Faculty of Design and Creative Technologies signed a Memorandum of Understanding (MoU). The MoU sets out how the two organisations might collaborate on health projects, based on an understanding that AUT saw an opportunity to develop and apply its design research and teaching activity in the health and social sector, and that the ADHB was interested in innovative solutions to population health, and service planning and delivery issues. A period of 'due-diligence' was then undertaken, during which time each

organisation interacted and developed an understanding about the activities and resources of the other. This period confirmed that both organisations would benefit from a design lab. It also demonstrated that the two organisations at that time had limited capacity and were yet to develop the necessary processes to fully realise the potential benefits of collaboration.

Initiating the Design for Health and Wellbeing (DHW) Lab

An opportunity for the ADHB to collaborate with AUT to develop a 'Design for Health and Wellbeing Research Lab' was confirmed, building on the ADHB-AUT relationship established by the MoU. The initial aims of the Lab included establishing and developing a community of interdisciplinary design-led research about developing products, services, systems and experiences for improved health and wellbeing of our population. It was expected that further developing the ADHB-AUT relationship would stimulate innovation for both parties and significantly contribute to enhance patient, family and community experiences over time. ADHB staff would have further opportunities to learn about design and they would also have access to design expertise, while the University would have access to meaningful, real-life design problems for its academic staff and students. The healthcare sector would both benefit from and attract creative expertise and talent to solve service planning and delivery issues. Staff and patients at the hospital would benefit from design's 'human-centred' approaches and focus on end-user experience.

The development of the proposed lab required a multi-pronged approach with both immediate and longer term goals (over a 12-month period). These fell into two general categories:

(1) the development of a research lab proposal to present to the ADHB/AUT Senior Management Teams asking for commitment;

(2) development and initiation of research projects.

A working group with representatives from the two organisations was established to pursue these initial goals. Over a several-month period the group met and established a framework for the implementation of a lab. Several themes were explored around a key research question: how can design contribute to improved health and wellbeing? (see figure 1)
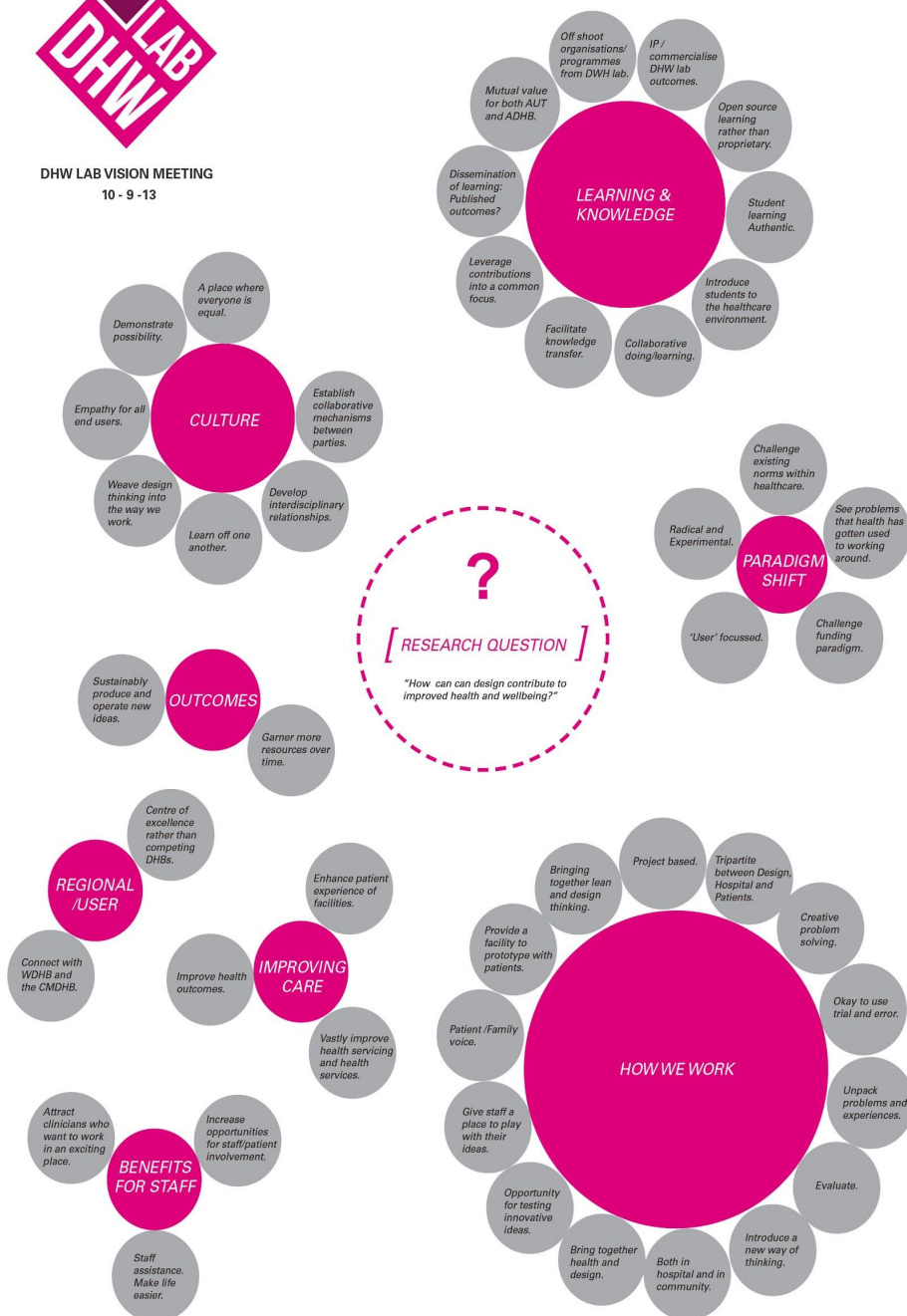
Figure 1: Initial exploration of themes to help develop the DHW Lab framework.

Developing the physical space

As students undertook a number of design projects to explore patient experiences (see selected examples below), a lab space was developed inside Auckland Hospital through a series of prototyping sessions. This space was forged by an approach that theorists of hybrid organizations have typified as 'creative'. This approach involves active attempts to alter the content of different institutional demands, the fusion of identities into a distinct new whole, and the creation of a durable identity that can emerge as an institution in its own right (Battilana & Lee, 2014: 404).

An area designated for future expansion was identified near the main public area, which, though not directly accessible to the public, was close to the 'heart' of the hospital. As the fit-out budget was limited, all furnishings were designed and made 'in house' using 3D workshops at AUT. The intention of the space was to actively communicate what design can be, by creating a dynamic, transformable space that encourages creativity and experimentation. As space in the hospital is at a premium, it was important that the use of the spaces was to be 'temporary', so the fit-out had to be designed such that it could be very rapidly packed down (figure 2).
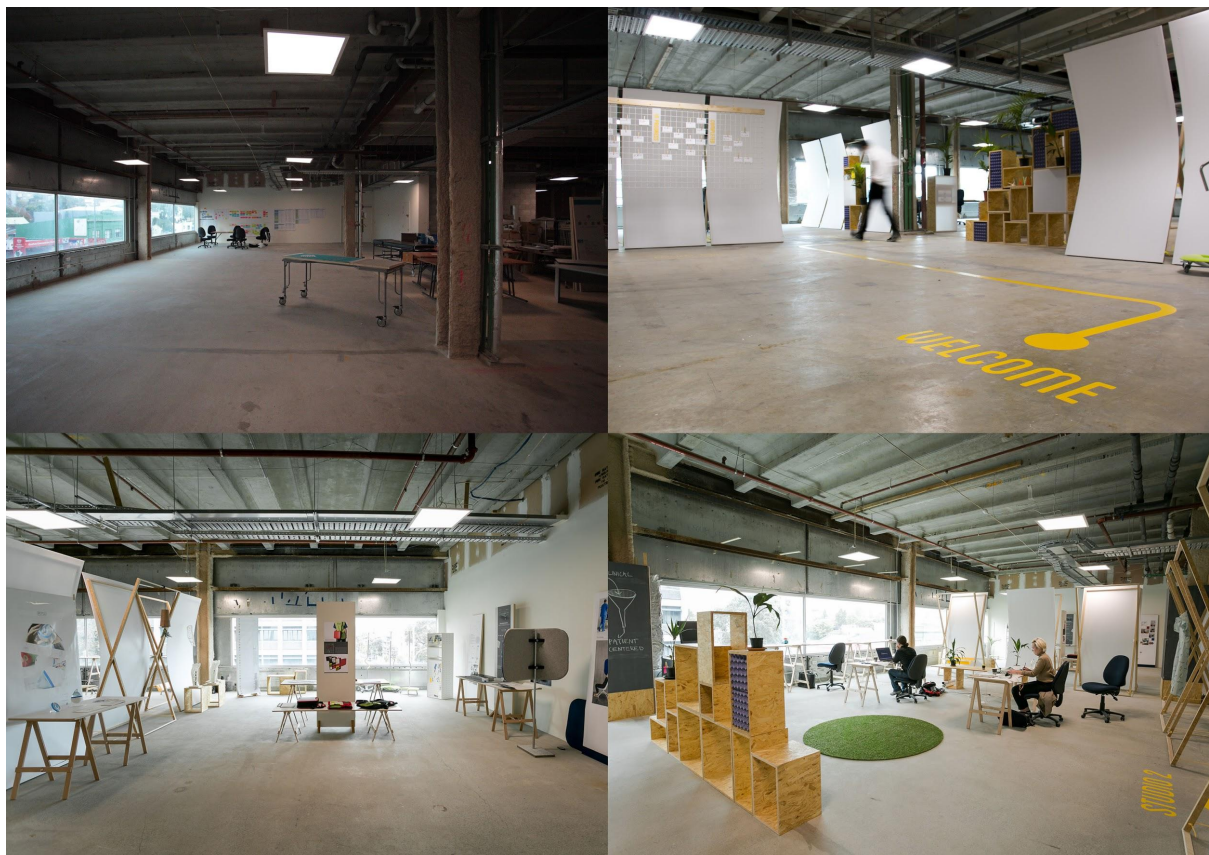

Figure 2: The Physical DHW Lab space before and after fit out.

Hospital projects

During 2013, while the fit out was being undertaken, a number of small design projects were being undertaken by the design graduates. These included working with staff in the Emergency Department to design a Journey Map that better communicates care pathways to patients (Bill *et al*, in press), as well as supporting a number of project workstreams being undertaken by performance improvement staff. In addition, a small number of postgraduate projects were being undertaken in association with the Lab, exploring opportunities to improve user experiences, as well as more traditional tangible product re-design projects.
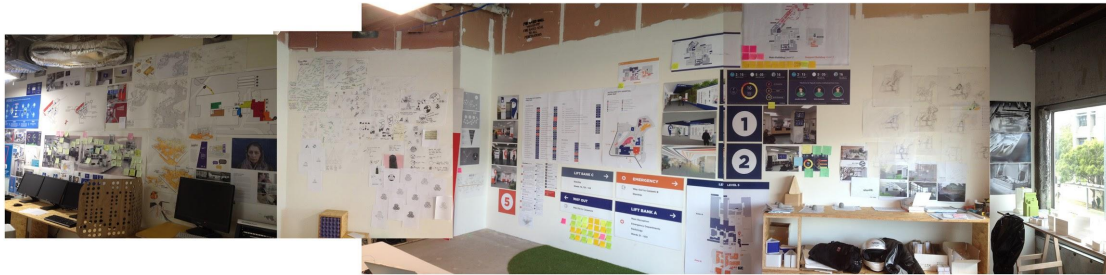

Figure 3: The walls of the lab spaces as a living record of the design process helps to stimulate conversation between visitors and designers.

Student experiences

One of the most important goals of the space was to enhance learning experiences for students by providing them with real-world opportunities and contexts for their work. One of the measures of success for both organisations is having students engaged in healthcare design projects through the DHW Lab. During 2014, a small number of undergraduate and postgraduate projects were conceived from the Product Design department at AUT. While these projects were not able to be easily run from the proposed lab space, they helped provide examples of the type of work students might undertake from the DHW Lab once properly established.

Following on from the initial student projects, the DHW Lab (as a completed prototype space) was able to host a summer (2014/15) internship programme in partnership with Auckland Hospital's IT department. This programme brought together design graduates and students with those from other disciplines (computer science, management, health sciences) to work on three main projects related to the use of information technology. This provided an opportunity to test the space and the underlying assumptions as to how the space would function as a collaborative interdisciplinary environment, with a diverse range of people working on working on real-world health projects. The interns were later surveyed about their experience of working in the space. The results of this

survey indicated that students enjoyed their internships and benefited from having the opportunity to apply their knowledge in real-world situations, but also identified a number of challenges that had mostly to do with hospital protocol (see figure 4).

Figure 4: Perceived benefits and challenges of DHW Lab space from student intern surveys.

While some felt their work had made positive contributions, most were sceptical that their work would contribute to an improved user experience for patients, visitors, staff. They were, however, hopeful that the implementation of their work would eventually improve user experience. One respondent said that while their work may not immediately help the hospital and its users, it nevertheless contributed to a conversation around user experience. The interns reported wanting an increased visibility for the projects they worked on and those being undertaken by others (both internally and in the wider design community), greater levels of collaboration, shorter 'quick fire' projects, and increased interaction with patients and visitors. Improved facilities (i.e. desks, better Wi-Fi, storage and more prototyping equipment) were also desired, along with better administrative support (i.e. project management, access to resources library, etc). Despite some of the challenges, the students reported having a better understanding of how the hospital actually worked, and useful exposure to diverse experiences and work activity. They reported an increased confidence in their work, ideas and ability, and an expansion of their design skillsets.

Organisational challenges

The recent 2014/2015 university summer break was the first opportunity to test how the DHW Lab might actually operate as perhaps originally intended. Alongside providing an opportunity to undertake a range of design-led projects for the hospital, and some paid design work experience for student and graduates, this programme also exposed some weaknesses of the lab. These included a number of operational, personnel and management challenges, that with hindsight were not unexpected given the 'start-up' nature of the initiative, and the lack of continuity from supervisory staff over the Christmas period. In addition, the physical 'space' was largely completed and 'open' to the hospital. While this was not formally undertaken, word spread reasonably quickly and the DHW Lab has been inundated with requests for help and to undertake projects. The result was an over demand on design capacity. This has resulted in challenges to recruit new design capability, develop suitable funding models, and house the new capacity.

Discussion

Moving forward into 2015, 2-4 design graduates and an ethnographer have been employed to support the DHW Lab's design and research activities through a more cohesive package of projects. These include programmes of work to improve the public spaces, sustainable transport, and completing projects from the previous year, including new smaller projects that were identified during this period. The different sources of skills and knowledge in the DHW Lab continues to generate mutual benefits for the ADHB/AUT partnership. Every design project at the Lab is characterised by a human-centred methodology that acknowledges the importance of developing an understanding of the experience of end-users through primary research methods such as interviewing and careful observation. Their open involvement in the research phase allows ADHB staff to learn about the empathetic design process, and simultaneously enables AUT students and academic staff to approach concrete design problems with the assistance and working knowledge of ADHB professionals.

Having penetrated an institutional context often characterised by hierarchy and dominance (Foucault, 2007), the DHW Lab acts as a 'Trojan Horse' (Macdonald, 2013) by promoting co-design processes from the inside. Because the purpose of the Lab is not only to improve existing systems and products but also to provide stakeholders and hospital staff with an opportunity to share new ideas, the space is therefore a significant presence in the hospital for its practical as well as *symbolic* value. There is, in this sense, an increasing awareness of the potential of the space in providing a voice and creative outlet for hospital staff and patients alike (see figure 5). Over time the Lab has established itself as a space where hospital users have the opportunity to contribute towards positive change, and to see a wide range of concepts rapidly prototyped, tested, and applied. These prototypes, which comprise a record of the DHW Lab's activity, are an integral part

of the physical space, helping create new opportunities for infrastructural growth by directing conversation toward patient-centredness and further experimentation (Bill *et al*, in press).

However the recent growth has revealed how important basic administrative systems and process are to support the growing and increasingly broad range of activities. The DHW Lab has been composed from a mixture of disparate parts. As an emergent 'hybrid organisation' it has not been designed entirely 'from scratch', but through a recombination of existing elements of other organizations. In its physical and organisational spaces, it is a prototype, coming together through iteration, trial and error. As (Battilana & Lee, 2014 p.403) remind us, the biological metaphor underpinning the hybrid comes from the mixing of existing populations as a mechanism leading to novel species. In order to establish the DHWLab as a viable and sustainable new species of organization, we now need to expand beyond the initial prototyping of 'lab space' and 'research space', and begin to prototype the 'organisational space'.
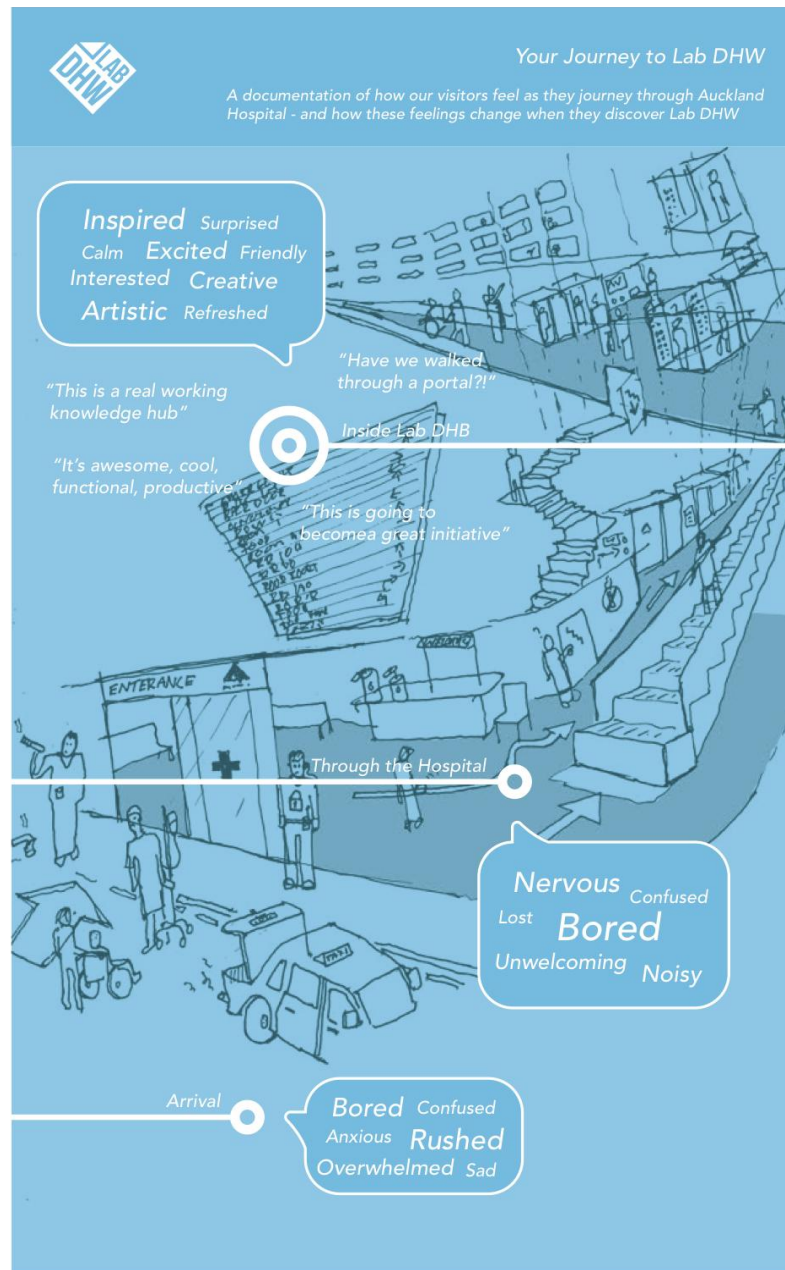
Figure 5: Quotes from a visitor book reflect how the space contrasts with the hospital.

References

Almirall, E., & Wareham, J. (2008). Living Labs and open innovation: roles and applicability. *The Electronic Journal for Virtual Organizations and Networks*, *10*(3), 21-46.

Battilana, J., & Lee, M. (2014). Advancing Research on Hybrid Organizing – Insights from the Study of Social Enterprises. *The Academy of Management Annals, 8*(1), 397-441. doi:10.1080/19416520.2014.893615

Bill, A., Reay, S. D., & Collier, G. (In press). Making Things Happen: Experiments in Prototyping from a Hospital Design Lab. Summer Cumulus Conference, Politicencio Di Milano, 3-7 June 2015.

Buchanan, R. (1992). Wicked problems in design thinking. *Design issues*, 5-21.

Hassan, Z. (2014). *The Social Labs Revolution: A New Approach to Solving Our Most Complex Challenges*. Berrett-Koehler Publishers.

Healthdesign.org. 2015. The centre for Health Design Knowledge Repository. http://www.healthdesign.org/search/articles. Accessed 1 March 2015.

Leydesdorff, L., & Etzkowitz, H. (1996). Emergence of a Triple Helix of university—industry—government relations. *Science and public policy*, *23*(5), 279-286.

Liedtka, J., King, A., & Bennet, K. (2013). *Solving problems with design thinking: ten stories of what works*. New York. Chichester: Columbia Unversity Press.

Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. National Endowment for Science, Technology and the Art.

Ranga, M., & Etzkowitz, H. (2013). Triple Helix systems: an analytical framework for innovation policy and practice in the Knowledge Society. *Industry and Higher Education*, *27*(4), 237-262.

Reay, S. D., & Withell, A. J. (2013). Educating multidisciplinary postgraduate product design students: challenges for a new programme. In J. B. Reitan, P. Lloyd, E. Bohemia, L. M. Nielsen, I. Digranes, & E. Lutnaes (Eds.), *Design Learning for Tomorrow*. PO Box 4 St Olavs plass, 0130 Oslo, Norway: ABM-media. Retrieved from http://www.abm-media.no/

Sanders, E. B. N., & Westerlund, B. (2011). Experiencing, exploring and experimenting in and with co-design spaces. *Nordes*, (4).

Sunley, P., Pinch, S., Reimer, S., & Macmillen, J. (2008). Innovation in a creative production system: the case of design. *Journal of Economic Geography*, lbn028.

Voorberg, W., Bekkers, V. J. J. M., & Tummers, L. G. (2014). A systematic review of co-creation and co-production: Embarking on the social innovation journey. *Public Management Review, Forthcoming*.