Preamble

Welcome to the first Design4Health Conference in Australia, convened by the Centre for Design Innovation, Swinburne University of Technology, on behalf of, and jointly chaired with, the conference founders, Lab4Living, Sheffield-Hallam University, UK.

The Centre for Design Innovation investigates and validates the key factors that underpin the design of products, services, systems, spaces, and symbols to improve the chance of user uptake and impact.

Lab4Living, who established the conference, is an interdisciplinary research initiative that develops products and environments, and proposes creative strategies for dignified, independent and fulfilled living for all.

This international event invited the world of health and design practitioners and researchers to come together between the 4th and 7th of December, 2017 in Melbourne, Victoria, Australia.

About the conference

Design4Health is an international conference that brings together designers, health professionals and creative practitioners with researchers, clinicians, policy makers and users from across the world to discuss, disseminate and test their approaches and methods in the ever-changing nexus between design and health.

The conference hosted a series of different events that provided an active forum to explore how the disciplines of design and health might intersect to bring forth new ways of thinking and working in what is a dynamic, innovative and increasingly important area of research and practice. The central question has been:

How can we work together to achieve positive and sustainable impact on the social, economic and cultural factors within our communities and beyond?

The range and insights presented at the D4HMelbourne event has revealed both the enormous value of this movement in research, and the benefits from undertaking serious, applied, and critical efforts that design and health expertise generate when they come together.

We invite you to browse the innovative ideas and critiques scoped in these proceedings

Sincerely

Associate Professor, Kurt Seemann, PhD. | Convenor | Design4Health 2017
Supporters and Partners

Cabrini Hospital  
Centre for Design Innovation, Swinburne University of Technology, Australia.  
Faculty of Health, Arts and Design, Swinburne University of Technology, Australia.  
Jean Hailes for Women’s Health  
Lab4Living, Sheffield-Hallam University, UK.  
Melbourne Cricket Ground, Melbourne.  
Ms Sarah Markey-Hamm and Ms. Siobhan Bahn, Conference Managing Agents, ICMS.  
Peter Stacey, Human Scale

Acknowledgments

Many people have contributed their time and skills to assist the 2017 International Design4Health Conference in Melbourne, Australia, and the compilation of the proceedings. We wish to personally thank and acknowledge the work by Associate Professor Deirdre Barron, (Chair, Academic Review Board), and the boards two executives, Dr Alen Keirnan, and Dr. Nicole Aimers. Also wish to thank the work of:

Ms. Fatma. Mohammed, and Ms Andrea Streckfuss (Centre Coordinators, Centre for Design Innovation, Swinburne University of Technology).  
Ms. Jenny Jiang (Project Management Intern)  
Associate Professor Simone Taffe (Design4Health Melbourne Exhibition)  
Ms. Bridgette Engeler (Design4Health Melbourne Exhibition)  
Dr. Gianni Renda (Design4Health Melbourne Exhibition)

Conference Convenor and Co-Chairs

Associate Professor Kurt Seemann (Convenor, Co-Chair)  
Director, Centre for Design Innovation, Swinburne University of Technology  
Professor Paul Chamberlain (Co-Chair)  
Director, Lab4Living, Sheffield-Hallam University

Academic Program and Review Committee

Associate Professor Deirdre Barron  
(Chair, Academic Program and Review Committee, 2017)  
Dr Nicole Aimers  
Dr Alen Keirnan  
Research Associate Kirsty Christer  
Mr. Heath Reed  
Associate Professor Flavia Marcello  
Associate Professor Carolyn Barnes

All papers included in these proceedings have been double-blind refereed by peers and revised to take into account the referees' recommendations.

Citation for Proceedings


Citation for Paper in Proceedings (format)


COPYRIGHT

© 2017 Sheffield Hallam University jointly with Swinburne University of Technology

Attributions: Creative Commons: https://creativecommons.org/licenses/by/4.0/

Lab4Living | Art & Design Research Centre | Sheffield Hallam University | Sheffield | S1 1WB | tel: +44 (0) 114 225 6918 | fax: +44 (0) 114 225 6931 | www.design4health.org.uk

Centre for Design Innovation | Swinburne University of Technology | Johns Street | Hawthorne | Victoria | 3122 | Australia | tel: +61 3 9214 8000 | www.cdiengage.com.au
# Table of Contents

1. **The role of users in an innovative service design process in healthcare**  
   Alhonsuo, M. and Miettinen, S.  
   p. 12

2. **Learning critical communication in social services: Innovations in communication practices and technologies through simulation pedagogy and service design**  
   Vuojärvi, H., Alhonsuo, M., Marttila, H.  
   p. 16

3. **Foyle Bubbles: How can design reduce suicide attempts using everyday social and civic spaces?**  
   Alwani, R., Raby, E., West, J., Bichard, J. and Spencer, J.  
   p. 20

4. **How do space and information technology affect patients’ waiting experience in an ambulatory centre?**  
   Annemans, M., Stam, L., Coenen, J. and Heylighen, A.  
   p. 24

5. **When interest pays off: The relationship between motivation, wellbeing and learning of technologies by older adults**  
   Beh, Jeanie and Sonja Pedell  
   p. 27

6. **Fit for purpose**  
   Bell, Alison  
   p. 31

7. **Design standards and disability: Limitations in person-centred home modifications**  
   Lo Bianco, Michael, Sonja Pedell, Gianni Renda, and Ajay Kapoor  
   p. 36

8. **The prototyping process of a patient support device for radiotherapy of breast and regional lymph nodes in prone position**  
   Boute, Bert, Wilfried De Neve and Jan Detand  
   p. 39

9. **Wardrobe Adapted for Wheelchair Users**  
   Bruckner, Melanie Sol, Gabriela Elise Fensterseifer, Gustavo Henrique Lagemann, Silvia Trein Heimfarth Dapper  
   p. 45

10. **Delivering healthcare: A reframing tool to uncover the right problem to solve.**  
    Cockburn, Jane and Clementine Thurgood  
    p. 50

11. **Design Anthropology and the medicalisation of ageing: Reflections on Designing for mild cognitive impairment**  
    Collier, G., Kayes, N., Reay, S., Hayes, N. and Bill, A.  
    p. 55

12. **Giving people living with dementia a strong voice: reflecting on the role of design to create enabling activities**  
    Claire, C. and Pedell, S.  
    p. 60
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Discourse and collaborative design: exploring a critical approach to community engagement for design research insight</td>
<td>64</td>
</tr>
<tr>
<td>Cunningham, Helen J., Joanna K. Fadyl, Stephen D. Reay and David E. White</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>14. Design for health: Experience of women-based food innovation initiative to overcome nutrition related health issues in Sri Lanka.</td>
<td>71</td>
</tr>
<tr>
<td>De Silva, S. and Akane, M.</td>
<td></td>
</tr>
<tr>
<td>15. Co-designing to understand the tracheostomy product experiences of long-term tracheostomy users.</td>
<td>74</td>
</tr>
<tr>
<td>Dickson, C., Reay, S.D., Douglas, R. and Nakarada-Kordic, I.</td>
<td></td>
</tr>
<tr>
<td>16. The refuge project: Designing through health, architecture and landscape</td>
<td>79</td>
</tr>
<tr>
<td>Donnelly, Samantha, Sue Dean, and Tracy Levett-Jones</td>
<td></td>
</tr>
<tr>
<td>The intervention:</td>
<td></td>
</tr>
<tr>
<td>17. Prototyping an emotionally responsive hospital environment</td>
<td>83</td>
</tr>
<tr>
<td>Douglas, R., Reay, S.D., Munn, J. and Hayes, N.</td>
<td></td>
</tr>
<tr>
<td>18. Designers and hospitals: Considerations from an ongoing collaboration</td>
<td>88</td>
</tr>
<tr>
<td>Daphne Flynn, Kate McEntee, Rowan Page and Troy McGee</td>
<td></td>
</tr>
<tr>
<td>19. Strategic design innovating wellness for the 21st Century workforce</td>
<td>91</td>
</tr>
<tr>
<td>Fry, A. and Alexander, R.</td>
<td></td>
</tr>
<tr>
<td>20. Using co-design workshops to develop a ward-level patient experience improvement toolkit.</td>
<td>95</td>
</tr>
<tr>
<td>21. Integrating responsive design and interdisciplinarity for healthcare environments</td>
<td>99</td>
</tr>
<tr>
<td>Haskell, N. and Loy, J.</td>
<td></td>
</tr>
<tr>
<td>22. Interdisciplinary and cross-cultural approaches to design for healthy ageing</td>
<td>103</td>
</tr>
<tr>
<td>Scharoun, Lisa, Danny Hills and Carlos Montana Hoyos</td>
<td></td>
</tr>
<tr>
<td>23. The impact of user experience on simulation or VR-based training software in the field of medical surgery and teaching environment.</td>
<td>106</td>
</tr>
<tr>
<td>Hilgiers-Yilmaz, Ute</td>
<td></td>
</tr>
<tr>
<td>24. Can you have your cake and eat it too? A dilemma-driven approach to design for the early stages of health behaviour change</td>
<td>110</td>
</tr>
<tr>
<td>Ludden, Geke, Deger Ozkaramanli, Armağan Karahanoğlu</td>
<td></td>
</tr>
<tr>
<td>25. Wellbeing and the lived experience of dying with dementia in a typical Australian RACF</td>
<td>115</td>
</tr>
</tbody>
</table>
26. Design for dementia: Making spaces for uncertainty  
   Fennell, Jac,¹ Cathy Treadaway² and Gail Kenning³  

27. Craft as purpose: Co-design for people living with advanced dementia  
   Kenning, Gail,¹ Cathy Treadaway,² Jac Fennell,³ David Prytherch⁴ and Andy Walters⁵  

28. Reciprocal design: inclusive design approaches for people with late stage dementia  
   Kenning, Gail  

29. QuittyLink: Involving smokers in the design of technology that supports individuals in quitting  
   Paay, Jeni,¹ Jesper Kjeldskov,² Uma Brinthaparan,³ Lars Lichon,⁴ Stephan Rasmussen⁵ and Nirojin Srikandaraja⁶  

30. Communication design project: Redesigning medicine administration for the elderly in Hong Kong  
   Kwok, S.H.  

31. Thick care: Designing for an ethic of care and complexity in community aged care services  
   Lorenzetto, Anna  

32. Creating a personalised self-management system for post stroke rehabilitation; utilising a user-centred design methodology  
   Mawson, Susan,¹ Nasrin Nasr,² Jack Parker,³ Huiru Zheng,⁴ Richard Davies⁵ and Gail Mountain⁶  

33. Designing for emergency departments: A literature review  
   McGee, T., Flynn, D., Coxon, S. and Keith, J.  

34. Kids in the waiting room: Lessons from Melbourne’s Royal Children’s Hospital  
   McLaughlan, R., Willis, J. and Sadek, A.  

35. Evidence and borrowing: Conversations with 8 architects on the use of evidence and innovation in the design of contemporary healthcare facilities  
   McLaughlan, Rebecca, Philip Goad, and Alan Pert  

36. ICU journey: Humanising the patient experience of Intensive Care  
   Meldaikyte, G., Fusari, G., Matthews, E. and West, J.  

37. Designing creActivities: Creative Methods to engage young people experiencing psychosis in co-design  
   Nakarada-Kordic, Ivana,¹ Nick Hayes,² Stephen D. Reay,³ Carla Corbet⁴ and Amy Chan⁵  

38. Responsive tangible rewards in physical activity gamification  
   Novak, James I.¹ and Jennifer Loy²  

---


p. 7
39. Design across the Spectrum: Enhancing inclusion for children on the autism spectrum in the playground
   Owen, Ceridwen, Damhnat McCann, Christopher Rayner, and Jackson Wells 171

40. Increasing confidence through competence in people with dementia through meaningful conversations
   Paay, Jeni, Metta Bank and Ivan Aaen 175

41. Interactive technologies helping young adults manage low self-esteem
   Paay, Jeni, Helle Larsen and Heidi Nielsen 179

42. The SEE toolkit: How young adults manage low self-esteem using personal technologies
   Paay, Jeni, Helle Larsen and Heidi Nielsen 183

43. Speculative co-design: a framework for designing medical devices towards enhanced usability, through explorations of experience.
   Rowan Page 187

44. Utilising Lego Serious Play to engage children and young people with ADHD and their parents
   Powell, L., Parker, J., Harpin, V. and Mawson, S. 191

45. Enhancing social connections amongst older residents of a rural town with community mapping and technology
   Paulovich, Belinda. 195

46. Technology in health and social care: a critical reflection from across two continents
   Pedell, S. and Claire, C. 198

47. Pictorial Language: A bridge to meaningful conversation between grandparent and adolescent grandchildren
   Mayasari, Angeline and Sonja Pedell 202

48. The hospital environment through the eyes of adolescents with long-term patient experience. Young people affected by cancer speaking
   Peeters, Kimberl, Pleuntje Jellema, Margo Annemans, and Ann Heylighen 207

49. Communicating information in health: Engaging students in design for health awareness.
   Potter, E., Reay, S.D. and Thornhill, B. 211

50. Stigma and the weight it carries when establishing a user experience Strategy: User research discoveries around mobility related issues
   Neagu, E., Raby, E. and McGinley, C. 215
51. Foyle Reeds: How can design reduce suicide attempts at a specific place whilst at the same time improving the experience for all?  
   Raby, E., Alwani, R., West, J., Bichard, J. and Spencer, J.  

52. Design for well-being: Examining Aceh post-tsunami houses  
   Rahmayati, Y.  

53. Dear pelvic floor exercises: A qualitative study among health professionals, pregnant and postnatal women  
   Barnard, R., Rodriguez Ramírez, E.R., Caudwell, C. and Baartman, V.  

54. NZ Fauna AR: an augmented reality exergame system to assist stroke survivors with independent rehabilitation.  
   Petrie, R., Rodriguez-Ramírez, E. and Chan, K.  

55. Exergames for healthy ageing: Inclusion through design  
   Čaić, Martina,¹ Vanessa Rodrigues,² Stefan Holmlid,³ Dominik Mahr⁴ and Gaby Odekerken-Schröder⁵  

56. Psychosocial Needfinding  
   Savig, E.S.¹ Gurevitch, J.H.,² Jackson, J.E.,³ Alinowski, A. Agarwal-Hashmi, R.,⁴ Sourkes, B.M.,⁵ Cohen, H.J.⁶ and Leifer, L.J.⁷  

57. Review of waste management service design for health and wellbeing in rural and remote Aboriginal and Torres Strait Islander communities  
   Seemann, K., McLean, S. and Fiocco, P.  

58. Designing innovative wayfinding systems in healthcare: from exploratory prototyping to scalable solutions  
   Short, E., Reay, S.D., Douglas, R.  

59. Designing health information to an acceptable standard: the state of the art, science craft, and design  
   David Sless  

60. Sharing the city: An intergenerational VR experience  
   Symington, Nicole, Kathy Constantin, and Sonja Pedell,  

61. Reimagining ageing: Insights from teaching co-design methods with designers, seniors and industry partners  
   Taffe, Simone,¹ Sonja Pedell² and Andrea Wilkinson³  

62. Taking the pulse: A survey of design for health development in Singapore  
   Koon Boon Tan, Michael  

63. Framing food literacies: Reflections from two Australian design-led innovation projects  

---

64. Research-led Design of a Communication Strategy for a Health Accelerator Program 283
Turukalo, M.,1 Thompson, J., Pedell, S.2 and Kommatas, C.3

65. Making better use of recorded patient experiences: transforming literature into a collaborative tool for inspired interaction 288
Villalba, C., Jaiprakash, A., Donovan, J., Roberts, J. and Crawford, R.

66. Designing for health beyond healthcare: From the institutional assumption to community health design 293
Vink, Josina,1 Vanessa Rodrigues,3 Lisa Malmberg,3

67. Designing emotionally resonant aesthetic experiences in healthcare. 297
Wan, T.,1 Reay, S.D.2 Smith, A.,3 Douglas, R.A.4

68. Evaluation of universal design—A scoping project 302
Watchorn, Valerie.,1 Cathryn Grant,2 Richard Tucker,3 Danielle Hitch,4 Patsie Frawley,5 Susan Ang,6 and Kathryn Aedy7

69. Decreasing the burden of hypertension: A design intervention to foster more accurate blood pressure measurements. 305
Jackson Wells, Ceridwen Owen, James Sharman, Niamh Chapman, and Rebekah McWhirter

70. Developing the Double Diamond process for implementation—insights from a decade of Inclusive Design projects 310
West, J., Fusari, G. , Raby, E., Alwani, R., Meldaikyte, G., Wojdecka, A., Matthews, E.

71. SlowMo/Mo—digital technology to provide support in coping with daily life 314
West, J., Wojdecka, A. and Matthews, E.

72. Co-creating a digital decision aid for people with dementia and their caregivers to fulfil their unmet needs 317
Van Zuthem, H.M.,1 Cila, N.2 and Wildervuur, S.E.3

73. Designing Information and Communication Technologies to support chronic disease self-management in practice: a case study from Australia and the Netherlands 322
Wildervuur, Sabine E.,1 Fleur Thomese,2 Julie Ferguson3 and Ab Klink4

74. What we wish we had known when we began: Insights on designing together with people with dementia in research and education 326
Wilkinson, A.1 and Hendriks, N.2

75. Violence, vulnerability, and care: A women’s history of HIV in America 329
Matthew Wizinsky
76. **Using Knowledge Mobilisation theory to inform the design of a co-design workshop for healthcare research and innovation**
   Joe Langley¹, Dan Wolstenholme², Rebecca Partridge¹, Ian Gwilt¹

77. **Improving the blood donation experience through better designed phlebotomy.**
   Wood, Caitlin and Selby Coxon,

78. **Actualising the participant designer: a case study in the design of health communications**
   Barnes, C.,¹ Wragg, N.³ and Wragg, L.³

79. **Playscapes: Pure Ludens**
   Yan, J.¹, Hedges, S.³, Reay, S.D.³

80. **Strength for task training (STT) exergaming for lower limb stroke rehabilitation**
   RuiFeng Yeo and Edgar R. Rodríguez Ramírez
Developing the Double Diamond process for implementation—insights from a decade of Inclusive Design projects

West, J., Fusari, G. , Raby, E., Alwani, R., Meldalikyte, G., Wojdecka, A., Matthews, E.

Helen Hamlyn Centre for Design, Royal College of Art, London

Keywords
Inclusive Design, Design Management, Implementation

Introduction
This paper details overarching methodological insights resulting from several Inclusive Design projects in healthcare spanning ten years. The insights draw on projects undertaken in partnership with a range of partners (commercial, public sector and charitable), differing in scope, funding and degree of implementation. A number of lessons have emerged, both practical and methodological, and are applicable to future design work in healthcare and the implementation of innovation.

Background
The projects informing these insights are the result of funding partnerships and collaborations. This is an important context, as the work is research driven; it does not follow a consultancy model, nor is the design work beholden to the client’s agenda.

The Double Diamond methodology (Design Council, 2015) was used in all projects. This well-established approach follows four phases: Discover (divergent thinking, researching problem), Define (convergent thinking, refine problem), Develop (divergent thinking, generating concepts) and Deliver (convergent thinking, refining concepts down to one or more). There are many variations of this model, and this methodology is increasingly run in parallel / mixed with an agile approach and PDSA cycles (Speroff and O’Connor, 2004), where rapid iterations of the methodology are run in series.

Another important contextual note is that projects tended to run for a year or more, allowing more time for a thorough user research period. An important remit of the work is to reflect upon practice, and the insights detailed here are not only retrospective but collected as the projects were in progress.

Methodological benefits
The Double Diamond is a known framework, and lends itself well to interdisciplinary working (West et al, 2014) as it is relatively easy to articulate the shared goals of each phase, particularly to front line clinical partners, in order to achieve a common understanding. Within this established framework, it is then easier to tailor co-research and co-design methods to suit specific user groups. The divergent and convergent
phases also offer opportunities for designers to immerse themselves in a given context, but also to withdraw and reflect.

These methodological benefits can be added to by further work at the start (‘Discover’) and more extensively at the end (‘Deliver’) phases.

**Initial setup**

The Double Diamond typically starts with a ‘problem statement’, with the ‘Discover’ phase involving co-research by the design team with relevant stakeholders and users to explore the problem from numerous different viewpoints. In order for this to be fully effective, much of the administration must be done in advance. The setting up of user groups, identification of gatekeepers, and importantly, obtaining any necessary ethics for the project can take time. With an engaged clinical partner, such steps can be taken in advance of (or early on in) the ‘Discover’ phase to reduce any delays in research (ICU journey).

**Implementation**

The final phase of the Double Diamond concerns delivery. The exact form that ‘delivery’ takes is unique to each project and partnership, but merits careful examination. Implementation of innovation is notoriously difficult in healthcare (Morris et al, 2011). Typically this is seen as post-‘design’, and necessarily requires the commitment of any healthcare project partner. Whilst some of the best innovations win design awards, many award-winning designs are not adopted into front line use. There may be more to be done in design terms. The practices of co-research, co-creation and co-design are well used. Could co-implementation be an additional focus? This opens the door to the debate about where ‘design’ ends, though clearly the end point at present is not leading to large scale implementation. Co-implementation efforts should start well before the end of the ‘Discover’ phase. These efforts may involve the identification of implementation stakeholders (standard practice in much co-design), but also funding bodies (Foyle Bubbles, Foyle Reeds), the development of business cases and the adoption of commercial constraints in the design (SlowMo/Mo).

Longer term implementation efforts may not be the focus of design, which then points to the need for a proper definition of an ‘end’ point. For startups, this might be the exit strategy, but for design projects it is context dependent. A service design improvement might see initial demonstrations in context (Patient Flow) as an end point; a product design might seek clinical trials, or a licensing agreement. As the technology for designing and prototyping improves, the fidelity of the output of such projects also increases. In a competitive innovation market, this means the level of necessary evidence behind an innovation in order to attract buy-in and adoption increases. This level should be scoped out during the ‘Develop’ and ‘Deliver’ phases. Accepted good practice in forming a brief (typically at the centre of the Double Diamond) is to embed measurables into the brief statement (Zenios et al, 2010). In the same manner, an end point for design efforts should be defined during the ‘Deliver’ phase or earlier, to ensure an agreed plan for implementation. Without this, there is the risk that the design project
results in a prototype being handed over to an implementation partner with no understanding of the means of adoption.

**Conclusion**

The Double Diamond is an accepted design research methodology, increasingly adapted and tailored to include other methodologies. It is a useful framework for interdisciplinary collaboration in that it can form a ready basis for a shared understanding of aims and work plans. The benefits of this approach are increased by advance preparation, and by thoroughly scoping implementation factors and stakeholders towards the end of the project.

Adoption of innovation in healthcare takes time, and is fraught with many complicating factors. Many lauded design outputs are not in use, pointing to poor implementation strategies. The above benefits of the Double Diamond must be applied to implementation in order to help adoption. Much more can be done during the design process to make the outputs better positioned for implementation. This not only means involving the relevant stakeholders and identifying the relevant funds for implementation earlier in the process, but crucially designing the output with an implementation strategy in mind. This practice of ‘co-implementation’ will improve future adoption of innovations.

**Acknowledgements**

The authors gratefully acknowledge the funding and partners behind the cited projects:

PHA Northern Ireland
The London Clinic
The Royal College of Physicians of Edinburgh
King’s College, London
Engineering and Physical Sciences Research Council

**Reference list**


