

Challenges and Strategies of Inter-Disciplinary Research and Development: Lessons from a Telehealth Project

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Presenter Bio

- Wei Zhou is a Research Fellow at Monash University, specializing in computer science with a focus on cybersecurity, digital health, and software engineering. Wei has published extensively in high-impact journals and conferences, with recent works focusing on the intersection of digital health and emerging technologies such as IoT and AI. Wei is committed to advancing the field of digital health by exploring new ways to integrate social and technical elements, ensuring that digital solutions are not only innovative but also practical and impactful in real-world settings.



Photo from Centre for legal innovation

Research Background

- ❑ The project aims to **enhance telehealth capabilities** in **palliative care** through **user-centered design** and **iterative development**.
- **Overview of Telehealth:** Use of electronic and telecommunication technologies to provide healthcare services remotely.
- **Focus on Palliative Care:** The project specifically targets the palliative care cohort, aiming to improve **quality of life** for patients and their families by enhancing telehealth tools.
- **Methodology: Agile R&D** approach with iterative cycles of development, testing, and feedback. Methods include **think-aloud** sessions and **simulation studies** to refine telehealth solutions.
- **An interdisciplinary team:** software engineering researchers, healthcare researchers, clinical experts, a telehealth industry partner, and a government entity.



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Challenges in Inter-Disciplinary R&D

1. Differences in Terminology and Protocols

- Discrepancies in terminology between healthcare and technology sectors. Example: Different interpretations of terms like "evaluation", "development", "implementation", and "co-design".
- Miscommunication and project delays due to varied conceptual frameworks.

2. Conflicting Interests and Expectations Across Stakeholders

- Researchers prioritize scientific contributions, while industry partners focus on product viability and market potential.
- Conflicting goals create tension in decision-making processes.

3. Participant Recruitment Challenges

- Difficulty in recruiting due to inclusion criteria and clinical gatekeeping, limited access to or familiarity with digital tools by patients, ethical concerns related to obtaining consent from palliative care patients, and busy clinician schedules.
- COVID-19 exacerbated recruitment challenges by overwhelming the healthcare ecosystem.

4. Covering the Full R&D Lifecycle

- Project covered the full lifecycle: ideation, co-design, software design, development, and evaluation.
- Coordination overheads due to the involvement of multiple disciplines.
- Ensuring alignment of efforts across activities was challenging.

Strategies for Interdisciplinary R&D

1. Team-Building and Open Communication

- Importance of trust-building and open communication.
- Regular meetings and team-building exercises (e.g., retrospectives) to maintain alignment and shared purpose.
- Reflexive discussions to address concerns and maintain transparency.

2. Co-Design with End-Users

- Human-centered approach with co-design involving patients, carers, and clinicians.
- Avoided "technology push" by focusing on real-world challenges faced by users.
- Solutions were developed based on feasibility, technical compatibility, and end-user needs.

3. Agile R&D Approach

- Iterative cycles of co-design, prototyping, and evaluation enabled flexibility.
- Allowed adaptation to changing circumstances, such as the pandemic.
- Continuous feedback from end-users ensured solutions evolved to meet emerging needs.

4. Working Closely with Industry Partners

- Collaboration with partners like Healthdirect Australia and Monash Health ensured real-world relevance.
- Industry partners provided insights into market potential and guided the project toward commercially viable outcomes.

Key Outcomes

❑ Improved Communication and Collaboration

- The project successfully improved communication and collaboration between healthcare professionals and technology experts throughout its duration.

❑ Interdisciplinary Innovation

- The interdisciplinary approach fostered innovation by bringing together diverse perspectives, leading to the development of telehealth software enhancements.
- The solutions were clinically relevant and technologically aligned with the industry partner's widely used platform.

Lessons learned

❑ Importance of Team-Building and Co-Design

- The project demonstrated the critical role of building cohesive interdisciplinary teams and co-designing with end-users to navigate the challenges of such collaborations.

❑ Agile Methodologies and Adaptability

- Agile R&D methodologies enabled the team to remain flexible and responsive to evolving needs and challenges during the project lifecycle.

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- ❑ **Ethics:** The research was conducted under the approval of the Human Research Ethics Committees of Monash Health and University of Melbourne.

Thanks!