UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Harnessing the Power of Design Thinking for Open Innovation

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Certificate of Original Authorship

I, Areej Fahad A Alqahtani, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Computer Science school at the Faculty of Engineering and Information Technology at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

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Dedication

I dedicate this thesis to my son Ali.

List of publications

The following is a list of publications with outcomes of work during the PhD journey:

1. Alqahtani, A., Hawryszkiewycz, I. & Erfani, E. 2021, 'Capturing Community Needs Through an Open Innovation Process', In *Proceedings of the 22nd European Conference on Knowledge Management (ECKM 2021),* Academic Conferences International Limited, Coventry, UK, pp. 29-35. **(Conference)**
2. Alqahtani, A., Hawryszkiewycz, I. & Erfani, E. 2020, 'Analysing Citizens' Inputs in Public Online Open Innovation Platforms'. In *Proceedings of the 26nd Americas Conference on Information Systems (AMCIS2020)*, Association for Information Systems. (**Conference)**
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4. Alqahtani, A. & Hawryszkiewycz, I. 2020. 'Integrating Open Innovation Process with the Double Diamond Design Thinking Model', In *Proceedings of the 21st European Conference on Knowledge Management (ECKM2020),* Academic Conferences International Limited, Coventry, UK, pp.1003-1006. **(Conference)**
5. Alqahtani, A., Hawryszkiewycz, I. & Erfani, E. 2022, 'Relationship Between Knowledge Creation and Open Innovation Applied Through Public Open Innovation Platforms', *The Electronic Journal of Knowledge Management. (***Accepted in journal)**
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Abstract

Open innovation is a concept through which an organisation taps on the knowledge of external sources and acquires creative ideas for value creation. Open innovation has received high interest from the private sector compared to the public sector. The lack of awareness of conducting open innovation in the public sector has been considered a barrier to applying open innovation in the public sector. To enhance understanding and provide evidence on using open innovation in the public sector drawing from a comprehensive literature review and aspects of the Double Diamond design thinking model, this study proposed an initial conceptual framework that depicts steps, activities and tools applied in the public sector's open innovation process. The conceptual framework was validated through a multi-case study design and interviews with open innovation responsible in different countries and analysis of the content of five open innovation platforms.

The research findings reveal details of the first stage which was missing in the literature that should be added to the open innovation process in the public sector which is problem determination. Moreover, the research findings elucidate that the five cases use design thinking to some extent, however only one case has used design thinking in the whole process and as a result overcome the challenges of the open innovation process compared to other cases which have some limitations regarding delivering the final solution to community, in addition to a lack of collaboration and coordination to implement the solution. Therefore, the best practice of design thinking enhances the practice of the open innovation process.

This study has theoretical and practical contributions by providing insights from the lived experience of those involved in conducting open innovation and content available in open innovation platforms in the public sector. This study enhances organisations' awareness of open innovation in the public sector and guides them on how to benefit from embedding the concepts of the design thinking approach to address the barriers to applying open innovation in the public sector.

Glossary

Closed innovation

Closed innovation is a concept where innovative ideas are generated within the organisation's boundaries and by people working in the same organisation (Bae & Chang 2012).

Community

In this study, community means people who can benefit from an online open innovation platform managed directly or indirectly by the government. The community can join the forum by posting their innovative solutions for a specific problem or even benefit from public resources about innovation.

Community's ideas

It is when the community starts to post ideas for the problem. It is a suggestion of ideas, not the final solution for the problem.

Community needs

A community's needs mean any requirements that the society needs about public services, such as the need for the best transport service.

Community problems

Community problems mean that there is a problem in a specific public service or product that is already provided for the community.

Community's solution

After the ideas are evaluated and selected, they can be a solution to the problem.

Creativity

It is a generation of novel ideas by individuals (Amabile & Pratt 2016). It is part of individual personality (Janssen 2000; Liu et al. 2020).

Design thinking

It is a human centred approach that searches to find the real needs of people and then finds ways to satisfy solve them and solve their problems (Brown & Katz 2011). It has many models, such as the Double Diamond model and the IBM design thinking model.

Double Diamond Model

It is one design thinking model for solving problems that contains different phases: discover and define the problem, then develop and deliver solutions.

Hackathon

In open innovation a hackathon refers to an event where the community can contribute to solve a problem in a competitive environment (Franco, Presenza & Petruzzelli 2021; Yuan & Gasco-Hernandez 2021).

Innovation

Innovation refers to implementing creative ideas for the purpose of generating value, enhancing value or achieving competitive advantage (Cruickshank 2010; Dewar & Dutton 1986; Hawryszkiewycz 2007; Miller & Miller 2012; Norman & Verganti 2014; Shaukat, Nawaz & Naz 2013)

Innovation process

A series of interrelated activities undertaken to generate new ideas for the purpose of generating value, enhancing value or achieving competitive advantage (Salerno, de Vasconcelos Gomes, et al. 2015).

Online open innovation platform (web-based open innovation platform)

It is a web-based platform which is used for open innovation; external parties can sign in and post their innovative ideas for problems published by the platform to any situation that they face (Milutinović, Stošić & Štavljanin 2018).

Open innovation

Open innovation is a concept through which an organisation acquires creative ideas from external parties (e.g. customers, researchers, or the local community) to generate value, enhance value or achieve a competitive advantage (Chesbrough, Vanhaverbeke & West 2006).

Participants

Participants mean the community who have already participated by submitting innovative solutions for a specific problem.

Problem statement (challenge)

In the open innovation platforms, a problem statement is the community's problem called a challenge that the community will read before they decide to suggest innovative solutions.

Public sector

In this study, the public sector refers to organisations that are managed by the government. All the studied open innovation platforms are run directly or indirectly by the government.

Wicked problems

A wicked problem is a very complex problem that has many causes and includes many stakeholders (Zivkovic 2018).

Winners

Winners are the participants who pass the evaluation process, and their innovative solutions have been selected for a specific problem.

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