

A Design Led Innovation Approach to Gathering Deep Customer Insights in the Aviation Industry

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Abstract: Research has long documented the value that design brings to the innovation of products and services [25]. The research landscape has transformed in the last decade and now reflects the value of design as a different way thinking that can be applied to the innovation of business models and catalyst for strategic growth [18, 22]. This paper presents a case study of gathering deep customer insights through a design led innovation approach and reveals industry perspectives and attitudes towards the value of deep customer insights within the context of a leading Australian airport corporation. The findings highlight that the process of gathering deep customer insights encourages a design led approach to testing assumptions and developing stronger customer engagement. The richness of the deep customer insights also provided a bridge to future thought by provoking possible product, service and business innovations which aligned to the airport corporation's vision. The implications of the study reveal how quantitative market data, which reveals broad sociocultural trends into 'how' and 'what' customers interact with within an airport, can be strongly validated and built upon through qualitative deep customer insights that explore 'why' those choices to interact are made. Future research is then presented which aims to widely disseminate a design led approach to innovation within internal stakeholders of the airport corporation through the development of a digital strategy.

Key words: *Design Led Innovation, Design Thinking, Deep Customer Insights, Passenger Experience*

1. Introduction

Airports are essential major infrastructure hubs responsible for mobilising goods, global services and people. Nearly 3 billion people and goods with a combined value of 5.3 trillion US dollars travelled by air in 2011 with the global aviation industry supporting close to 57 million jobs and 2.2 trillion US dollars in economic activity [17]. Global population growth and more affordable air travel is placing pressure on the aviation industry to continually develop and expand facility capabilities, in order to improve the provision of services to increasing passenger numbers. Within the aviation industry, the airport sector is reliant on developed horizon models which utilize incremental innovation as upgrade milestones [17]. A more immediate priority for the airport sector is to gain a deeper understanding of passenger needs as a means for creating better airport experiences and tailoring retail and services to increase revenue streams. Aligning immediate passenger needs with long term vision and horizon models for growth presents as a challenge for the airport sector in stabilizing its position within the aviation industry.

Market data, in the form of quantitative analytics has traditionally provided passenger engagement models within the aviation industry. Quantitative market data is aligned to passenger volume numbers which the aviation industry relies on for capacity modeling [16]. This market data comes from passenger touch points such as customs and immigration. Whilst market data is essential in revealing broad sociocultural trends and passenger volumes, the airport sector is now looking to design as providing an opportunity to gather deep customer insights and build new customer engagement models. Deep customer insights enable a deeper understanding of why passengers' behave in certain ways and make choices within airport facilities. The current problem statement which this paper responds to is therefore: *How to gather deep customer insights of passengers in order to design an airport experience that is both exceptional in operational standard and rich in experience for the passenger, and which ultimately leads to significant returns on investments?*

Design and the culture of design thinking, is now perceived as a ubiquitous capability essential to creating and capturing new value through a better understanding of customers and their broader need [11]. A shift towards design as a resource for linking strategy to innovation [1,4,18,22] has been validated by a number of policy driven innovation schemes across the world which seek to implement design knowledge within non-design firms [2,12,20]. The value of design lies in the way designers approach problems; typically from multiple perspectives [9], iteratively prototyping and improving upon possible solutions [13], whilst simultaneously synthesising the user's needs and desires with what is technologically possible [5]. With this value in mind, the role of design has now progressed to inform decisions at the strategic level of business. Design now plays a vital role in aligning deep customer insights with the internal operations of a business to encourage growth and develop innovations beyond product and service level [6].

Design led innovation requires a company to have a vision for top line growth, which is based on deep customer insights and expanded through customer and stakeholder engagements [8]. The outcome of design led innovation is the integration of design within all aspects of a business to enable a vision to be achieved. Deep customer insights are generated within the design led innovation approach and enable a deeper understanding of the meanings and motives underpinning the behaviour and choices of customers [8]. Within the aviation context, deep customer insights reflect the 'meaning' underpinning passenger behaviour and engagement with services provided within an airport facility. These services provide vital additional revenue streams and are a platform for partnerships within the aviation industry. A greater understanding of passengers' 'why' [14] can be strategically harnessed to deliver business model innovations which reflect the corporation's vision and provide a means for differentiation from other close competitors [7]. In this case, the airport corporations' vision is to be 'worlds best' in the way it operates and the services it provides to airlines and passenger. Internal strategic decisions are made within the innovation process of the airport in order to strive for this vision to be 'worlds best'. However, these innovation projects do not always have the voice of the customer present within project development. The voice of the user or customer is an inherent component of the design led approach to innovation. Deep customer insights form part of the larger design led journey which aims to develop an internal cultural shift to the strategic use of design as a capability within a business, able to align customer needs to a vision for growth [1, 8]. Utilising these insights to create industry value has redefined a new role for designers [8] and has disrupted current educational models for teaching design and perceptions within the design industry itself [7].

This paper presents an overview of the design led innovation process used to generate deep customer insights within a leading Australian airport corporation. The paper presents findings into the initial expectations and

feedback from key internal stakeholders towards the generation and value of deep customer insights in order to highlight some prevailing assumptions toward design led innovation. Industry value derived from the deep customer insights project is documented to support the immediate value of design led innovation within the airport sector in creating richer customer engagement models as the platform for innovation projects. The implications of this research are then discussed and expanded to include the development of a digital strategy for the airport corporation. The digital strategy project will provide the avenue to continue building design thinking capabilities within the airport corporation for the continued use of design led innovation through embedded action research over a period of 12 months.

2. Gathering Deep Customer Insights

2.1 Case Study Research

This project utilises a case study approach to gather deep customer insights. Case study research is described as a research strategy that focuses on understanding the dynamics present within a single setting [15]. Typical case study methods include narratives, interviews, observations and questionnaires [15]. Case studies can include single layers of research or multiple layers of cases as a comparative approach within a study. Case study research also presents opportunity for embedded design research. The embedded case study approach [25] offers the ability to analyse multiple levels of data within a single case. Importantly embedded cases offer insight into the cultural dynamics present within the business [25]. The scope of a case study presents a platform for understanding the unique organisational dynamics within a single context, in this case an Australian airport corporation.

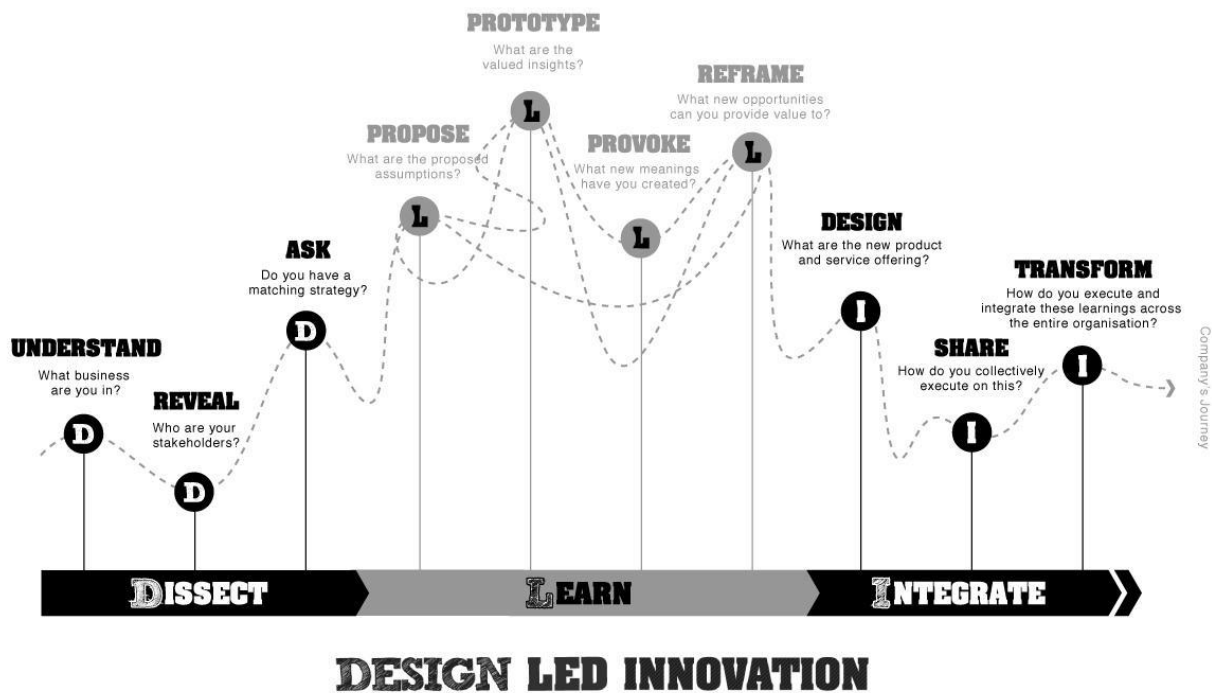
2.2 Aims and Objectives

The airport corporation project aim was to gather deep customer insights through the design led approach in order to unpack the ‘meaning’ associated with passengers engagement within the international terminal of a major Australian airport. The deep customer insights project was undertaken on both landside and airside of the international terminal and was completed by internal staff of the airport corporation. An innovation in meaning initially comes from subtle interpretations of sociocultural factors [22]. An innovation in meaning, or the underlying reason why a customer might use a product or service, can form the basis for a breakthrough innovation [22]. Changes in aesthetics and function serve as incremental innovations only within high cost environments [21]. As this project was industry based, the aim of the deep customer insights project was guided by a set of deliverables outlined by the airport corporation. These deliverables were based on existing market data held by the corporation that presented an international breakdown of four key passenger segments. These passenger segments include; Australian and New Zealand passengers, European and British passengers, Chinese and other Asian passengers, and American passengers. The airport corporation also outlined the four key research areas of interest within the airport, selecting areas of possible passenger improvement through the services provided. These service groups were; duty free, specialty retail, food and beverage, and overall airport experience. Overall airport experience provided passengers with an avenue to discuss personally unique insights based on their holistic experience of the airport facility. The aim of the deep customer insights project was to investigate the meaning underpinning each passenger segments’ engagement with the four stated service groups.

2.3 Process

Gathering deep customer insights forms only part of the design led innovation process and provides the link between a vision for growth or in this case study, a desire to be ‘world best’, and the integration of this vision within all aspects of the business [8]. This stage is called the ‘learn’ stage and its position within design led innovation approach is demonstrated in Figure 1.

Figure 1. Design Led Innovation Journey Map



The process of gathering deep customer insights through this project was based firstly on observations by shadowing passengers as they travelled within the airport. Market data and the initial data from the passenger shadowing was then presented within an internal design led workshop with the aviation corporation key stakeholders working collaboratively to utilise the design led tools. This process is demonstrated in Figure 2. From these results, an emotional touch point timeline was created which matched the persona designs with likely everyday narratives. The emotional touch point timeline builds upon traditional service design touch point time lines to unpack how a passenger may feel at any specific point of their experience by linking specific touch points either side of the passenger making a purchase or an interaction with the emotional state of the customer. Importantly the emotional touch point timeline looks to unpack the underpinning motives that may guide the persona design behaviour and emotions through a developed narrative. This tool draws upon the traditional design tools of persona design, narrative creation and touch point timelines to stimulate stakeholder engagement in the design led process.

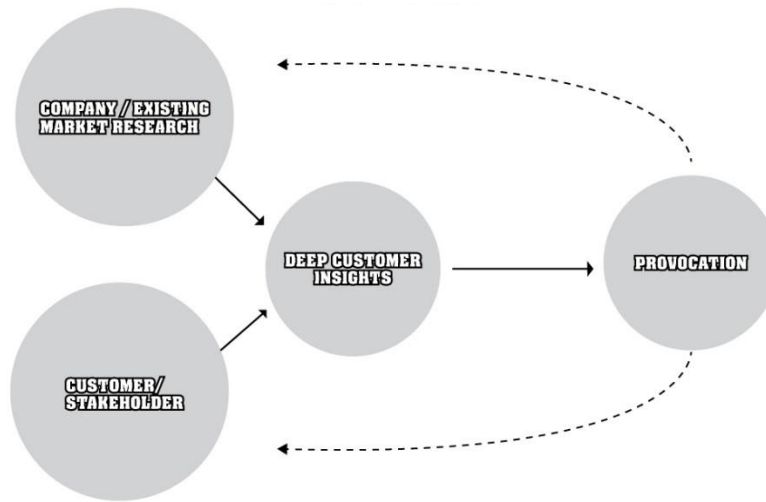


Figure 2. Deriving Deep Customer Insights for Design Led Innovation

Persona designs were created using the design led innovation touch point timeline tool. A set of persona designs acted as human representations which passengers and internal stakeholders could empathise with. Stimulating empathy with customers is considered critical to creating solutions which are viable, desirable and feasible [4] and is considered an important milestone in the design led innovation process [8]. A set of narratives [1] were created to encapsulate the persona designs in an everyday airport experience according to national segments whereby the persona would interact with the identified areas of improvement, for example specialty retail. These narratives were presented to passengers within the airport visually as part of semi structured interviews. The aim of the interviews was to provoke deeper responses with passengers and allow them to respond to the presented narrative.

This new data was then transcribed and analysed using a thematic method to uncover strong underlying themes [3]. The results were then presented back to the key internal stakeholders where new provocations were co-designed in a workshop environment using the tools of design led innovation. These design led tools were, the emotional touch point timeline, persona design, narrative, the seven whys, and the business model canvas. The solutions were then placed back into new and revised narratives and taken back out to new passengers to build a new and refined layer of provocations to which the passenger could respond.

New data from the semi structured interviews was analysed thematically again to identify strong underlying themes, and a set of final results generated. These final results were presented to the aviation corporation as part of the project deliverables. Within the entire process, 68 semi structured interviews were completed with the four identified passenger nationality groups over a six month process. These interviews lasted between 20 and 40 minutes. The process of generating deep customer insights is qualitative. The nature of process whereby narratives are built and tested, new meanings are explored and provoked, then disseminated with key internal stakeholders and built again iteratively contributes to the richness of customer data collected.

2. 4 Research Approach

At the conclusion of the research project (1 week after the final presentation of results), four semi structure interviews were undertaken with key internal stakeholders of the airport corporation to uncover their initial expectations, perceptions of design led innovation, and the value that the deep customer insights provided to the business. Feedback on the entire deep customer insight process was also explored through the interview process. Internal stakeholders held senior managerial and strategic positions within the corporation. These stakeholder held the titles of; business performance manager; terminal retail and commercial manager; retail and tenant coordinator; and retail marketing manager. The stakeholders were key in the completion of the deep customer insights project and were present during design led innovation workshops. The exploratory nature of the research and the embedded nature of the researcher's position within the airport corporation supports the small participant size as an approach to exploring rich data [10].

Questions pertained and probed into the initial expectations of the deep customer insight project and key takeaways from the project. The actionable value that the deep customer insights provided was also explored to determine whether the corporation found the findings relevant and had planned to immediately improve the passenger experience within the international and domestic terminals of the airport. How the design led process differed to existing customer engagement programs was also explored through the semi structured interviews.

The stakeholder research was completed with ethical clearance. Semi structured interviews were completed in a face to face setting and lasted approximately 60 minutes. Semi structured interviews were recorded and transcribed with participant consent. Transcripts were then analysed using a thematic approach [3, 19] to uncover consistent themes.

3. Results

The results from key the stakeholders are broken into three groups; uncovering 'why', testing assumptions, and uncovering possible opportunities from deep customer insights. The results suggest that the design led process challenged existing attitudes toward collecting customer data and tested assumptions held by internal airport corporation stakeholders. Previous data collection focused on researching identifiable problems, with a quantitative research approach that presented passengers with closed questions or in some cases, multiple choice questions. The design led approach to creating deep customer insights challenged prevailing attitudes towards the depth of understanding that could be achieved through qualitative passenger research.

3.1 Uncovering 'Why'

Existing qualitative research methods employed by the aviation corporation were basic and linear in structure and provided limited useable outcomes. A key stakeholder described the existing research methodology of the aviation corporation, *'previous research was more like, "did you buy this today? Yes or no. What sort of [services] would you like to see in the airport?" It was very basic and didn't delve into the actual mindset of passengers at all. Uncovering the 'why' underpinning passenger behaviour through deep customer insights was also new to the corporation's existing research methodology. 'We've never specifically asked our passengers 'why', we'd undertaken qualitative research before, but we couldn't really generate any thoughts of our own from the results'.*

Feedback from the deep customer insight process was that the corporation would perform future research using a qualitative platform first to understand the passengers so called 'why'. The corporation would then plan

quantitative research to validate the deep customer insights using much larger passenger numbers. A perception still remains that no large scale implementable action could occur based on a small sample size alone.

‘I think qualitative should be first, and then once we have the qualitative research and the ‘why’, then you can ask the [service] questions to a larger passenger group. I don’t think we can actually act upon 70 or so interviews alone.’

3.2 Testing Assumptions

Stakeholders who had been with the corporation for longer periods also noted that some of their assumptions about passengers had been validated and also expanded upon to include a deeper understanding of ‘why’ passengers behaved in certain ways. With a greater understanding of ‘why’, these stakeholders then felt comfortable moving forward and creating solutions.

‘I have been in airport for 8 years now, and I have a few gut instincts, I would like to think that I know about the challenges that passengers face. But I didn’t realise why some of those challenges existed. Now at the front of my mind, I know what passengers want, and now I know why. So now I can create a solution that would solve that problem.’

The expectation of deliverables challenged key stakeholders in the early stages of the design led workshops. Some stakeholders took more time to adjust to the delivery of the results from the deep customer insights. It was noted that the assumption of market research was that the results would be presented as solutions, and key stakeholders placed higher emphasis on the results rather than the process itself. However, the deep customer insights were not presented as solutions, rather as insights which could be used to frame possible new meanings by which solutions could be created.

‘It was completely new concept for me, using research to build reasons and detail, not straight up solutions. It took me a little while to see that the link was the depth of results, which then helped me create solutions myself.’

During the stakeholder workshop stage of design led approach, stakeholders were guided through the use of the design tools. Feedback suggested that processes and tools provided new and more suitable ways to approach passengers, particularly culturally sensitive passenger groups. Stakeholders mentioned how approaching passengers with a persona design encased in a narrative prompted passengers to be more giving of their time and information. *‘I thought the tools were very clever in that they allowed us to approach passengers in a new way that was less direct or personally intrusive but still engage them and have them share with us.’*

3.3 Opportunities from deep customer insights

Key stakeholders commented that the industry value of the project results came from the depth and richness of the passenger insights. The richness of deeper passenger insights proved powerful with long standing staff who felt they had a well formed understanding of passenger’s needs.

‘The value of the research was definitely that we were able to uncover all these pieces of incidental information from passengers that were really detailed and something we’d never considered. There were some things uncovered that we simply wouldn’t ever think to ask about.’

The value of the research has been justified by the corporation's plans to adopt the design led approach to gathering deep customer insights for future research projects. These plans cover projects on the corporation's digital strategy and more key retail partners within the terminal facilities.

'We are looking to adopt this process again to do some research with users of our financial exchange services. We are keen to understand 'why' customers do and don't shop so we can help our key business partners adapt to how people manage their money these days.'

The results of the deep customer insights have also provided immediate industry value upon which the corporation has acted to improve its airport terminal. Although specific details of these upgrades cannot be disclosed, three key initiatives are now installed within the airport terminal in direct response to the findings of the deep customer insights. The deep customer insights from a targeted Chinese passenger segment were also strongly validated by a separate 6 week project conducted by the corporation's Chinese liaison officer within the international terminal.

4. Discussion

Design led innovation requires a company to have a vision for top line growth, which is based on deep customer insights and expanded through customer and stakeholder engagements [6]. The airport corporation explored through the generation of deep customer insights has a developed long term vision. This vision to be 'world's best' both in operation and passenger experience requires a customer focused shift from traditional business to business reliance on airlines, to better understanding and meeting passenger's needs. Gathering deep customer insights has provided a richer understanding as to why passengers choose to engage, or not engage with certain services provided within the airport. Uncovering the 'why' underpinning passenger behaviour proved to be of great value to the aviation industry corporation [14,22]. Not only did it guide the immediate upgrading of airport terminal, it has led to a more informed understanding of culturally specific challenges and a level of empathy towards passenger experience. Establishing empathy for customers is an important milestone for creating more desirable solutions [4] and is seen as a key capability that business can adopt from design [1].

In utilising the persona design encased in a third person narrative, the deep customer insight process provided a novel way to approach passengers for interviews. The interviews provided richer data for unpacking and analysis than previous qualitative studies undertaken by the corporation. Deep customer insights alone do not present outright solutions, rather they frame a design brief or a set of constraints [8] which stakeholders can use to inform a solution. An initial point of confusion raised by stakeholder interviews was that the research was expected to produce stand alone solutions. Stakeholders held a linear perception of how solutions were created from research which was challenged by the iterative design process which develops provocations. In this case, the deep customer insights produced provocations [8] and guided new thoughts and meanings within the corporation. An innovation in meaning is the basis for radical new solutions [22] by which new competitive advantages can be developed.

Initially, stakeholders placed a higher emphasis on the results than the actual process. Such a view presents as a clear challenge for embedding design with the aviation industry. In comparison, designers place greater emphasis on the process in order to create more innovative final solutions. The design process may seem frustrating or even unproductive to non-designers [13] and this is a key challenge to embedding design within any business. Design tests validity, whereas business moves forward based on reliability [18]. Overcoming this challenge requires strong leadership, a commitment to the design process, and a human resource capable of articulating deep customer insights into industry value [1, 7]. The process of gathering deep customer insights though iterative

provoking and refining of new meaning, is what develops deeper understanding of the passengers ‘*why*’ [14]. It was noted that initial confusion about the process was overcome during the design led workshop phase of the approach where the design tools and purpose became directly associated with generating results and more deeply disseminated within the airport corporation.

After the final results, the deep customer insights project was presented, stakeholders were able to create better solutions, which quantitative data could then be used to validate. These stakeholders were not in positions typically associated with creativity or design. However, the deep customer insights project provided a strong platform on which stakeholders then felt confident to solve problems, using design principles. These principles reconciled passengers needs with what was desirable, feasible and viable [4] and provided an approach towards the solution that spanned multiple perspectives [6].

5. Implications

The implications of this research are that deep customer insights can provide immediate industry value to businesses through the improvement of products, services and customer engagement models. Whilst initial barriers to the process of deep customer insight generation were linked to the emergence of design led innovation, these perceptions were for the most part overcome through the iterative design led workshop environments where findings were discussed with stakeholders.

This paper presents an industry perception that quantitative market data, which reveals broad sociocultural trends into ‘*how*’ and ‘*what*’ people interact within an airport must still validate any qualitative deep customer insights which interprets ‘*why*’ those choices to interact or are made. The value of the deep customer insights to the industry is the development of a platform by which stakeholders can then confidently solve problems, engage partners, and develop project briefs. The process of generating deep customer insights could extend to provide critical new customer engagement models within other industry types, allowing businesses to better understand their customers’ needs and desires through dialogue.

6. Future Research

The extent to which design principles were instilled during the deep customer insight project or encouraged by the depth of the findings is an avenue for future research. Given that the aim of design led innovation, is to embed design as a cultural shift within a business [8], this research project has provided promising feedback. The next step is to develop internal capabilities within the corporation to link deep customer insights to the corporation’s vision for through a design led innovation approach (Figure 1).

The next stage of this research agenda follows the airport corporation’s implementation of design led innovation within the development of a new digital strategy. This digital strategy will be developed using a design led approach to innovation; heavily involving customers and stakeholders through narratives and testing within the early stages of the design process. The deep customer insights process will be used again, but in this case, to provoke through narrative techniques possible future digital solutions to passengers. The aim of design led innovation is to embed design thinking as a cultural shift within a business towards customer engagement and the innovation processes to allow the business to achieve the value from this approach independently as a new capability. Developing internal capabilities within the corporation to link deep customer insights to the corporation’s vision for a future airport will come from the continued dissemination of design led innovation

techniques within the airport corporation. This research will track the barriers and opportunities to the theoretical framework of the design led approach. Future publications will report on the findings and implications of this continued research.

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