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Opportunities to connect

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Design-led innovation and sensemaking: opportunities to connect

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Design-led innovation (DLI) is a framework with particular focus on developing design capability. Implementation of DLI has been observed to positively influence firm innovation performance. As the framework is of relative infancy, there is opportunity to learn from and integrate methods and practice from other fields to strengthen the implementation of DLI. Therefore, the aim of this paper is to make explicit, the similarities DLI shares with sensemaking as in order to provide clearer approaches to managing the design process. An action research design is applied for 14 months within a major Australian Airport Corporation (AAC) to implement DLI. Qualitative data is collected and analysed, with the findings showing there are implicit similarities between the practice of DLI and mandates of sensemaking. The paper contributes opportunities to strengthen DLI by incorporating mandates of sensemaking consciously to enrich interpersonal interactions during the design process.

keywords: uncertainty; complexity; foresight; retrospective

Introduction

Common practice for business is to explore future possibilities as a strategic exercise, while simultaneously exploiting current operations to sustain profitability (O'Reilly & Tushman, 2004). Where knowledge is created from uncertainty, sensemaking can occur (Weick, 1995). Where ambiguity or complexity are present, sensemaking can be consciously applied to create new knowledge and new value within an organisation (Gioia



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& Thomas, 1996). Within this arrangement, knowledge is viewed as a verb, an action of knowing and unknowing (Dervin, 1998).

While Kolko, (2010; 2015) proposes that design can allow sensemaking to be harnessed as future orientated mechanism, the theoretical grounding of such a claim remains untested. This paper does not seek to bridge this claim empirically, but rather continue to bring the two fields closer through discussion of implicit similarities. The scope of the design discipline is narrowed to the framework of DLI, given its recent interest from the design community (Wrigley, 2016).

DLI is a framework with particular focus on developing design capability. Implementation of DLI been observed to positively influence firm innovation performance (Wrigley, 2016). As the framework of relative infancy, there is opportunity to learn from and integrate methods and practice from other fields. Therefore, the aim of this paper is to make explicit, the similarities DLI shares with sensemaking in order to provide clearer approaches for interacting with users customers and stakeholders. This contribution will benefit organisations and individuals seeking to become design-led in the future. To achieve this aim, this paper reports on an action research study within an Australian Airport Corporation (AAC) for fourteen (14) months, whereby DLI was implemented within a strategically critical project. The following research questions are observed and guide this paper:

RQ1: What similarities does design-led innovation share with sensemaking?

RQ2: How can the implementation of design-led innovation be strengthened through sensemaking?

It is important to note that this paper tracks the implementation of DLI, not sensemaking as a methodology. Sensemaking literature is used as a frame for discussion in order to propose how DLI can be strengthened – embracing the virtues of reflective practice (Schön, 1983). The differences between the two fields is an item for future research, with this paper focused on how to improve the practice of DLI as a starting point. The researcher will be referred to as an innovation catalyst from here on, understanding the unique combination of DLI and action research configures the researcher as a driver of change (Wrigley, 2016). The paper concludes with implications and directions for future research.

Uncertainty

To grasp sensemaking, first, it is important to briefly touch on the nature of uncertainty and the accompanying impact on business. Uncertainty is a state of unknowing based on the presence of ambiguous, imperfect, incomplete and/or unknown information (Geersbro & Ritter, 2010). For a business, uncertainty limits the capacity to make decisions, placing stress on management (Pahlke, Strasser & Vieider, 2015). From a poor decision the risk of an undesirable outcome can impact the very existence of an organisation (Savage, 2009). For this reason, uncertainty as a basis for risk is the enemy of business.

However, uncertainty and risk are ever present, described by van den Berg and Pietersma (2016) as the “ubiquitous and characteristic side-effect of taking action by organisations” (p.100). There are risks too that accompany strategic inaction (Porter, 2008). The premise of strategic management is to provide business with methods, tools and techniques within

an overarching approach to transform uncertainty into value. However, the complexity and nature of forthcoming innovation challenges places strain on deductive and inductive management methods available (Liedtka, 2014). A building block for the *design movement* is set (Buchanan, 2015).

Sensemaking

Sensemaking is a critical activity for individuals (Dervin, 1992) within organisations (Weick, 1995) involving the creation of order from unknown. The process of sensemaking is tacit and related to cognitive and socially constructed meaning. The methodological rationale of sensemaking is best described by Dervin (1998, p.39):

The bottom-line goal of Sense making from its inception has been to find out what users – audiences, customers, patients, clients, patrons, employees - 'really' think, feel, want, dream.

Dervin's (1992) framework (Figure 1) provides a metaphoric framework for individual sensemaking. A situation in time will be accompanied by a lack of knowledge. This lack of knowledge is both peripheral and immediate. New knowledge is then created through action - whereby memories of the past and present are explored to consider and importantly predict future solutions. Dervin (1998) recommends time-situation specific questions like: what brought you here today? What problem would you like solved? What got in your way? What emotions or feelings did you experience? Table 1. further documents key mandates described by Dervin (1998) to scaffold user interactions. While these questions are retrospective, the outcome of knowing what the user 'really' needs, wants or dreams can contribute to a platform for prediction. The situation (now at a new present time) can be addressed through appropriate decisions – leading to an outcome. Additionally, a prediction can lead to good decision making under the pressure of uncertainty – and conceivably enable foresight. This is the relevance of sensemaking to design. The methodology supports an interface between researcher and user that while retrospective, can align to and potentially enrich the future orientated rationale of design.

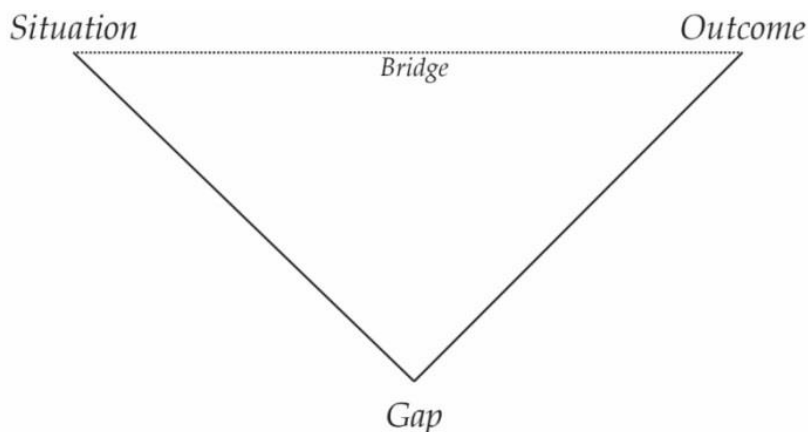


Figure 1. Sensemaking framework – Adapted from Dervin (1992)

Table 1. *Mandates of sensemaking from Dervin (1992; 1994; 1998)*

Mandate	Description	Example (Possible method/s)
Identify and address assumptions	The process of knowing and unknowing. Our assumptions are what we know, however we must unlearn them in order to grow	A sense maker questions their own perceived bias of a phenomena by reading opposing theories and argumentation (Database search; observation; literature review)
Manage fluidity	People and environments may be different from the previous day. Therefore, the sense maker must be willing and equipped to know why change occurs	The sense maker collects information that shows a user's appreciation of a system has changed over time. The sense maker must then identify what caused that change in order truly know the user (Survey; reflective writing; guided discovery; task analysis)
Attend to emotions and feelings of the user	Emotion and feelings becomes the frame through which knowing takes place.	A user is asked to rank their emotions during and after using a system (Quiz; questionnaire; interview; reflective writing; task analysis)
Manage power structures	The sense maker must be aware of and manage drivers (implicit and explicit) that challenge both users and people within an organisation	A proudly united community is asked about disagreement. Pockets of discord are revealed that challenge the sense makers ability manage how the project will proceed. The sense maker must become sensitive to the communication of knowledge (Interview; focus group discussion; reflective writing)

Managing power structures is described more definitively in organisational sensemaking. Organisational sensemaking considers how the workplace environment contributes a unique set of drivers and normalities that effect the individual sense maker (Weick, 1995). As organisations are complex and multileveled systems involving people from many different backgrounds, creating order becomes a unique social process that emerges from complexity (Maitlis, 2005). In addition to internal interpersonal dynamics, an organisation's collective openness to the environment will determine how much information is collected – with more information challenging an organisation to negotiate greater uncertainty and process more knowledge. However, the sensemaking activity remains bound by the unit of the individual. As Dervin explains; between self-relating to self; self-relating to another; self-relating to a collective and so forth (1998). Therefore, this paper will focus on how the innovation catalyst implemented DLI within the organisational context of the AAC.

Framework: Design-Led Innovation

The purpose of the DLI framework is to assist organisations to develop design capabilities by supporting how design is applied. The DLI framework is comprised of the 'external' and 'internal' spaces of organisation, intersected by 'operational' and 'strategic' activities (Figure 3). The innovation catalyst, described by Wrigley (2016), becomes vital to guiding an organisation's progression through the framework. The framework has been studied from multiple perspectives involving the innovation catalyst, with empirical evidence demonstrating a positive impact on company innovation performance (Wrigley, 2016). With stakeholder engagement and visibility to DLI comes increasing awareness of design, leading to design capability. According to Bucolo, Wrigley and Matthews (2012), moving through the framework involves three key phases, further identified in Figure 2. These phases are:

1. Gathering customer insights from customers and stakeholder that reveal deeper latent needs;
2. Proposing future orientated solutions that capture value from these customer and stakeholder insights, and;
3. Shaping strategy that leverages the value unlocked by future orientated propositions - these propositions being grounded by customer and stakeholder insight.

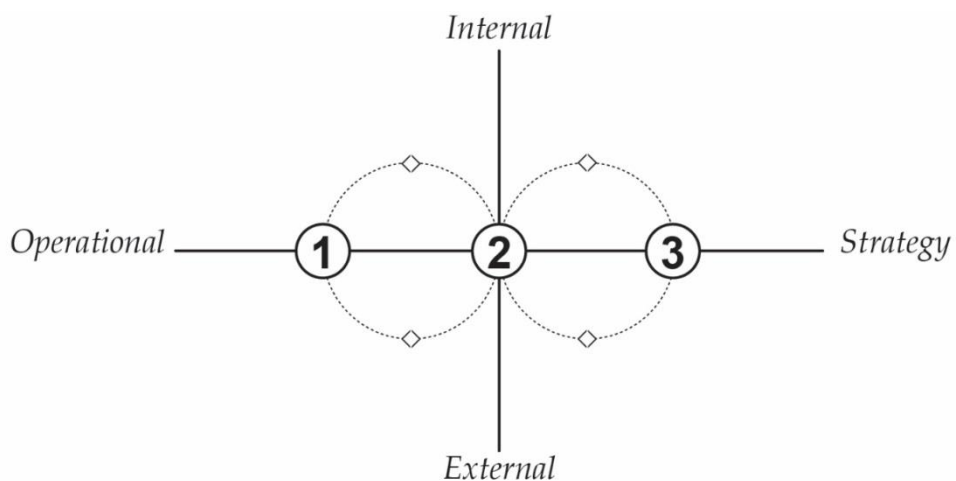


Figure 2. Design-led innovation framework

DLI uses methods central to the discipline of design to create product and service solutions that are integrated, anticipate future user needs, build future proposals and encourage feedback (Bucolo et al. 2012). To achieve these solutions, methods of design are applied to make deeply understand the customer's pains and gains as opportunities. Here lies conceptual similarities between the application of design methods and various mandates of sensemaking (earlier presented in Table 1). This paper sets out to make explicit these similarities by tracking the implementation of DLI through an action research methodology.

Research Design and Methodology

An action research methodology was applied over a period of eight months to explore the DLI within a high reliability organisation (Chivers, 2014). Action research is defined as the study of a social situation with a view to changing the action within it (Elliot, 1991). The methodology comprises of cycles of planning and action. These activities are linked through reflection and observation (Zuber-Skerritt, 2012). This methodology involved a cycle of action and research that aligned to one industry project. This project is loosely termed “digital innovation” as the nature of the project sought to make sense of current passenger experience in order to predict future opportunities in a digital space. Details on this project are tabulated in Table 2.

Table 2. *Project details*

Project Name	Action Research Cycle Duration	Project Aim and Outcome	Methods Applied	Stakeholders Involved
Digital innovation	14 months	The aim of this project was to enrich passenger experience through digital channels The outcome of the project was the launch of two new mobile applications, a digital departure card and the implementation of an organisation wide digital strategy	Reframing Persona design Narratives Three horizons model Persona design SWOT analysis Touch-point timeline	9/9 internal AAC departments Innovation catalyst Digital consultant

Industry Context

The AAC provides a novel and worthy context for the exploration of DLI, as the operational challenges it faces provide immense threats and opportunities given the Airport’s high-reliability status within society. The oncoming opportunities and consequent challenges associated with digital diversification (Taneja, 2011), globalisation and capacity demands (Goedeking, 2010), and a progressive shift toward an aerotropolis business model (Frank, 2011; Kasarda, 2008) is testing current methodologies within the AAC. Airports also operate in a vast networks, placing pressure on governance structures to decide courses of action (Donnet, Keast & Walker, 2011).

The AAC undertakes new product and service development through a typical stage gate process. Participants within the AAC also described the approach to innovation as one of “smartly following” industry leaders (Damanpour & Wischnevsky, 2006). This approach, while beneficial, meant that the AAC relied heavily on partners and outsourcing for creativity and design capability. This was the context and rationale for implementing DLI within the AAC.

Data Collection

Qualitative data describe situations and are typically non-numerical, which supports the exploration of DLI as a concept where prior theory is undeveloped. This study collected qualitative data through four research methods: semi-structured interviews; focus group discussion; field notes, and; reflective journal . The reflective journal and field notes entries were recorded by the innovation catalyst. Table 3 contains data collection particulars. Participants were sampled from across the organisations structural to represent both horizontal and vertical levels of the business. The four data collection methods were triangulated, adding integrity to the research design.

Table 3. Data collection

Method	Quantity	Time	Foci	Authorities
Semi-structure interview	15	1-1.5 hours	Gather data regarding outcomes and opportunities of visualisations as part of DLI. Understand how uncertainty is currently made sense of.	Agostinone-Wilson, 2012
Focus group discussion	1	1.5 hours	Understand the impact of visual methods on AAC innovation process and sensemaking as part of DLI	Basch, 1987
Field notes by innovation catalyst	90 x A5 journal pages	NA	Internal dynamics and reception of DLI framework during projects. Reception of visualisation as part of DLI. Elements of sensemaking that occurred.	Zieman, 2012
Reflective journal by innovation catalyst	Approx. 2500 words	NA	Organisation of thoughts during reflection. Creating greater awareness of experiences and the relationship between ideas, relating to framework of DLI and the practice of design	Parker & Goodwin, 1987

Data Analysis

At the completion of all cycles, a thematic analysis approach described by Ezzy (2002), was applied. This overarching analytical approach involved in the following order; open coding; axial coding; selective coding, and; write up. A separate coding scheme was applied to the analysis of each cycle as each cycle involved unique planning, action, observation and reflection phases. Analyses were completed using NVivo software to aid the storage, management and security of the data.

Findings

The findings are segmented into situations related to moments where uncertainty was encountered by the innovation catalyst. These situations involved how the innovation

catalyst interfaced with individual customers and stakeholders, the collective AAC as an organisation and external stakeholders. These situations are: bridging gaps in customer insight, gaining approvals and the need for consensus.

Situation 1: Bridging gaps in customer insight

The first situation concerned the lack of customer insight during the project. Available resources within organisation of innovation catalyst came from market research and was quantitative in form. It was noted that this information, while valuable as it represented a large volume of customers, provided little novel insight in why passengers behaved and made certain decisions. The innovation catalyst then went about implementing DLI with stakeholders to collect deeper insights.

One participant notes to the innovation catalyst of the methods applied within DLI by the catalyst, "I thought the tools were very clever in that it allowed us to approach passengers in a new way that was less direct or personally intrusive but still engage them" and of the outcome:

We were able to uncover so many issues, emotions, reasons that we will be able to tap into...it has given us so much more direct insight from our passengers that we will be able to act accordingly.

Another participant noted of how assumptions were previously the foundation for making strategic decisions. This participant noted, "We can't sit here and assume what people want — which we still do. We need to go find out what it is — once we have all that we can go and transform [our customers'] experience to make it better". Who these customers were was clarified and described, "It is not just [the] passenger; it's the 'meeter' and greeter or somebody else". This expanded the view of who the customer was, widened the scope of value creation beyond the obvious passenger-airport opportunity.

Additional insight from participants concerned the novelty of the DLI within the project, "It was [a] 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 and amount of reasons that then framed an answer". This element of surprise at the extent of customer insight was an important feature of DLI. These findings also provide insight into the previous innovation process of the organisation — from identified problem to solution with little exploration and reframing.

Situation 2: Gaining approvals

The second situation of uncertainty encountered within the project by the innovation catalyst concerned regulatory challenges to the project. The uncertainty and gap in knowledge for the catalyst became, what will be the form/function of this solution and how will this solution pass regulatory policies. These fundamental questions had the potential to prevent the project from progressing toward a solution state. This uncertainty addressed by visualising the concept through narrative method to key stakeholders. In Figure 3, one such visual narrative method is illustrated. The realistic narrative was created with a prototype of the design concept in the form of a mobile application, combined with existing airport infrastructure and captured through photography to show context of use. The visual artefact was presented to the necessary stakeholders to gain investment within the organisation. In addition, the narrative was presented to the Australian Government in order to negotiate regulatory barriers to allow for the design

concept to progress toward solution. The government granted regulatory approval under conditions, for a trial of the project.

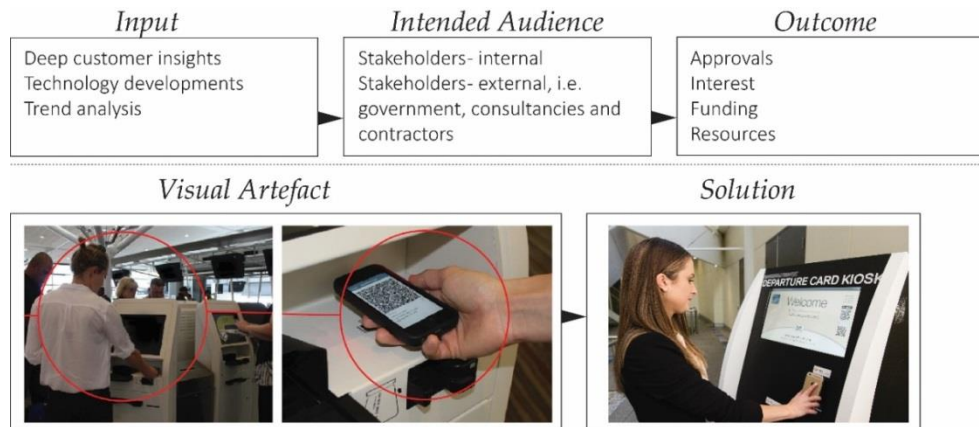


Figure 3. Realistic “passenger” narrative

Reflecting on the narrative method, participants noted to the innovation catalyst, “The narratives. They are really useful. Much better than writing a detailed ten page scope. I think people understand it more, most people turn off after starting to read a report”. The notion of reading a ten page report provided insight into the existing formal innovation processes of the organisation. This particular participant continued:

*The departure card presentation to the [government] in Canberra.
Attended by seven different agencies. Yes, everyone understands the
departure card and the process. It would have been okay to just show
them. The passenger narrative puts it into reality - to make sense of it.*

Feedback from participants related to the outcome of the narratives within the context of the project. One participants noted, “If you apply that narrative it becomes visual and powerful” and that, “The Senior management team were like ‘wow — that’s fantastic’”. This endorsement is evidence of the potential of the DLI to surprise and drive innovation in an environment where regulatory barriers are commonplace. On the lower right hand side of Figure 4, an image from the launch of the solution to market is presented providing insight into the outcome of this project. The solution was at the time, a world first solution enabling the passenger to complete their departure card digitally.

Situation 3: The need for consensus

The third moment of uncertainty facing the innovation catalyst was the lack of a digital strategy within organisation. As a result, there was little consensus across the organisation regarding the form and function for digital channels – both present and imagined. As one participant notes, “We will always have an airport with hard assets, like a runway and apron to park an aircraft...We will never have a digital airport”. In addition the another participant notes, “Digital is a big challenge for a big traditional business like ours... I guess it was one of those gaps which is an emerging opportunity”. Action was taken to address this lack of consensus given the prevalence of digital technology in everyday life.

The innovation catalyst then led the organisation through the process of defining a digital strategy. The catalyst notes within the reflective journal, “As part of the production of this strategy, the term ‘digital’ was defined through a series of meetings where the innovation catalyst observed discussion and took field notes. Based on themes within these meeting, the catalyst then developed a set of design narratives that explored themes of a possible digital strategy. Figure 4 is one such narrative that became the foundation of the current AAC digital strategy. These narratives were presented across the organisation in order to gain broader insight.

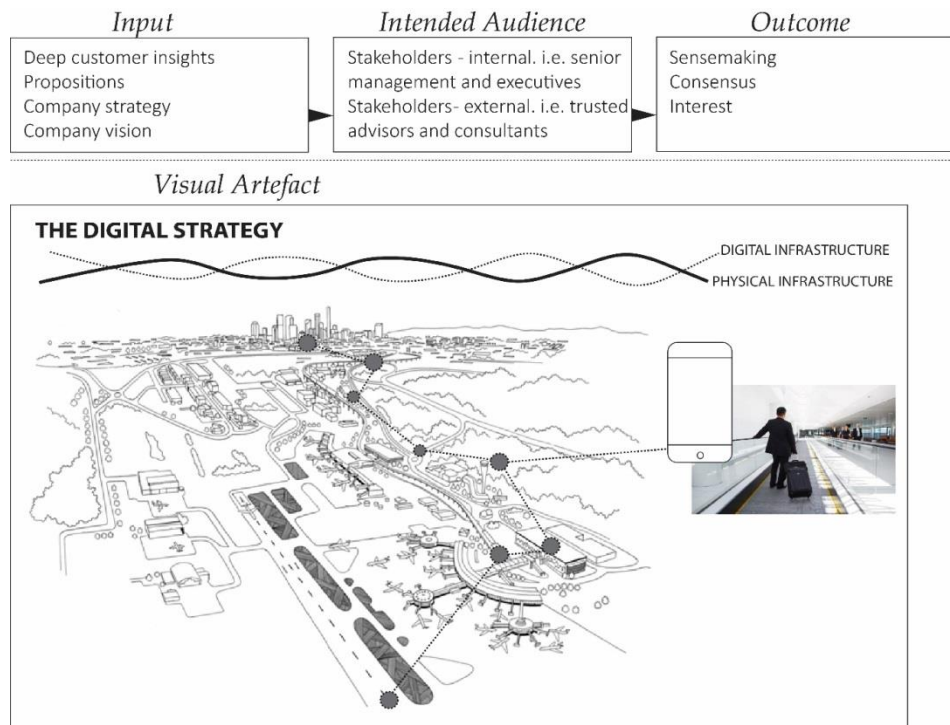


Figure 4. Strategy Narrative used within the digital project

This contrasted the organisation’s approach of smartly following industry examples and challenged the organisation to take leadership. The catalyst further reflects, “Creating a digital strategy was a healthy activity for the organisation and developed discourse regarding new concepts, technology and social trends” (Reflective Journal). A participant notes of the digital strategy:

It has taken this long to cement a strategy, which shows how complex it is. I think only people really teaching it is at the forefront of what it is and how it fits into the business. But I don’t think it is as complex as much as people make out. I think is just another part or delivering on your business strategy in general. This is a tool or plank in that strategy.

This strategy was adopted by all areas of the organisation and represents consensus, where previously there was ambiguity in the form of many discrete and isolated digital channels belonging to separate departments. At a strategic level, previous to the formation of this strategy, there was only uncertainty of ‘what to do with digital’ until a

competitor or leader within the industry took visible action. As one participant describes “we like to smartly follow industry competitors”. The organisation has since received industry recognition for their initiative as a digital strategy leader in the form of:

- The mobile application created as part of the project was awarded ‘Best in Class’ at the *Global Interactive Media Awards 2015*;
- The mobile application was awarded a high score (26/30) on the *Moodie Reports APPraisal 2015*, making the project outcome one of the highest of all scorecards for any airport ever; and
- The AAC was awarded the ‘Best Airport in Australia/Pacific’ by *Skytrax, World Airports Awards*; and
- The AAC was awarded the 2015 *Brisbane City Council’s* ‘Digital Strategy Innovation Award’ for its digital strategy leadership.

The digital business strategy now underpins daily value creation. In the last 18 months since the AR cycles ended, the AAC has launched multiple products and services which align to their digital business strategy – allowing the organisation to move autonomously from market leaders.

Discussion

As evident in the findings, the AAC is now in a position of leadership with increasing interest from within the industry for its digital strategy. From an external perspective, the AAC can be described as having foresight. What this research reveals, is that this foresight is an outcome of a design process, applied within the framework of DLI.

DLI is framework for developing design capability (Bucolo et al. 2012). Within this case study, DLI was not applied as a deliberate form of sensemaking but rather to drive radical innovation within the organisation, in doing so building design capacity. The findings reveal that the implementation of DLI shares implicit similarities to mandates of sensemaking (Table 4). These similarities provide an opportunity to learn from another field that shares user-centred ambitions and has particular emphasis on individual units of interaction (Dervin, 1998, p. 39). This is important as the DLI framework operates at a domain level with emphasis on where design is implemented within an organisation (see Figure 3). The framework overlooks how an innovation catalyst must develop and manage knowledge at an interpersonal level. Mandates of sensemaking provide an avenue to strengthen this conceptual weak point.

Future implementers of DLI (innovation catalysts and organisations) may learn from and explicitly apply methodological mandates, methods and techniques of sensemaking to enhance interpersonal interactions within organisations. These proposed opportunities to connect sensemaking to DLI are discussed in Table 4. This discussion is a set propositions only at this time and is therefore a platform for future research.

Table 4. Discussion

Findings	Similarity to sensemaking mandate	Discussion of finding	Opportunity to incorporate mandates of sensemaking during DLI
Bridging gaps in customer insight	Identify and address assumptions	Assumptions about passenger experience are formed from one's own experience as a traveller. Often these assumptions were disconnected with the insights gathered from passengers by the innovation catalyst. The catalyst then had to challenge existing assumptions in order to drive progress within the project.	Our assumptions are what we know, however we must unlearn them in order to grow. Here DLI could use sensemaking techniques to communicate to stakeholders, that in order to 'embrace' new insights, we must first consciously unlearn our assumptions. This perspective offers amore systematic approach to stakeholder engagement.
	Attend to emotions and feelings of the user	Deeper emotions were revealed using DLI that explained the motivation and desires underpinning passenger behaviour and decisions. This was previously inaccessible information as market research did not produce such insight	In sensemaking, emotion and feelings becomes the frame through which knowing takes place. This constructive view can be further justification for why organisations must have 'empathy' for their customers – as if often communicated during design
Gaining approvals	Manage power structures	The AAC operates under a leasing arrangement from the Australian Government. Regulatory frameworks connect these organisations together. The negotiation process between these organisations involves inherent power structures – manifesting as politics. The innovation catalyst chose to use visual design methods that showed a new type of passenger experience in order highlight an opportunity regulatory reform – rather than argue or negotiate for change	The sense maker must be aware of and manage drivers (implicit and explicit) that challenge both users and people within an organisation. In this project, the innovation catalyst maintained emphasis on a design-led approach to innovation. Sensemaking principles can inform how an innovation catalyst steps into a policy and regulatory domain, with particular emphasis on managing personal relationships - while concurrently managing the design process.
The need for consensus	Manage fluidity	Stakeholders within the AAC are influenced by the changes (and progress) in their own projects on a daily basis. These changes inform how they view the possible rationale of a digital strategy. The innovation catalyst must iterative, meeting with stakeholders in cycles to gather insight then share these insights.	People and environments may be different from the previous day. Therefore, the sense maker must be willing and equipped to know why change occurs. Iterative cycles of DLI currently serve to build insight over time (in an outcome orientated way). Here, an innovation catalyst can learn from and apply sensemaking to strengthen retrospective analysis and reflection as part of problem framing and solving

Conclusion and Implications

DLI is future orientated with a rationale to create positive change through outcomes of the design process. Sensemaking is retrospective with a rationale to continually develop knowledge and empower people. The two are similar at conceptual and theoretical levels, but also distinct. Pairing aspects of sensemaking within the design process, completed by the designer or innovation catalyst (within DLI) is an opportunity to strengthen reflective practice during the design process. This proposition is an area for future research. It is recommended that such research is practice-led in format as sensemaking requires deeper insight into the activities of the sense maker. The similarities between sensemaking and DLI identified within this paper are recommended as a starting point for this type of research.

The following implications are articulated:

- DLI, while future orientated and effective for company innovation performance, lacks guidance for how an innovation catalyst should manage interpersonal relationships during the design process;
- Reflective practice during the design process presents an opportunity to connect with sensemaking methods and techniques, and;
- Future research is required to continue building a relationship between DLI and sensemaking.

These implications provide value to individuals and organisations seeking to build design capability or aiming to establish strategic foresight, particularly as DLI as a framework tends to focus toward a domain level. These implications are also valuable to the academic community, as a link between DLI and sensemaking provides a rich avenue for future research where sensemaking is consciously applied during the design process.

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