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Customer Inspired Innovation with Designer as Innovation Catalyst

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Abstract:

This study explores the processes of introduction, implementation and integration of design-led innovation within a family owned company driven by engineering innovation in a sector dominated by product and process improvements. This paper is based on the outcomes of an investigation of a family manufacturing company in the METS sector over an 11-month period, where the researcher was embedded in the firm to deliver value to the company by using an action research approach. The design innovation catalyst used a design-led innovation process to capture customer insights that led to changes at the leadership, managerial and employee level of the organisation.

Keywords: customer insights; design; innovation catalyst; manufacturing; business to business; organisational change

1 Introduction

Companies with prior success with technological innovation are often not aware of new methods of gaining information about the demands for their products and services using customer focused methods. Design driven innovation and design led innovation have emerged as powerful approaches to generate, shape and deliver new value propositions and innovation.

This study explores the processes of introduction, implementation and integration of design-led innovation within a family owned company driven by engineering innovation in a sector dominated by product and process improvements. This paper is based on the

outcomes of an investigation of a family manufacturing company in the METS sector over an 11-month period, where the researcher was embedded in the firm to deliver value to the company by using an action research approach.

The goal of this paper is to increase knowledge of the influence and benefits of design led innovation in assisting companies generate new ways of working and new possibilities that design led innovation has demonstrated and can bring to a company. In addition this research demonstrates the largely untapped potential of a designer to work as an innovation catalyst to assist a manufacturer develop customer inspired innovation explore how design-led innovation can overcome barriers and recognise opportunities within a changing market context.

The overarching research question driving the study was: How can a METS manufacturer use design-led innovation to overcome barriers and recognise opportunities within a changing market context? This research looks to build new knowledge in understanding the practical application of various methods of creative innovation within the design-led innovation framework, and to study their impact and effect on the company's uptake. Action research expressly encourages a collaborative approach with the participating company that is experiencing the change, and is particularly important to the research aim of using design-led innovation as a mechanism to bring about organisational change.

2 Background

Australian companies in the mining equipment and technology services (METS) sector have played a critical role in the innovation effectiveness of the global mining industry. However, the long term viability of the METS sector in Australia is susceptible to the commodity driven industry global industry it supports. To survive this current low in the mining cycle, companies in the mining industry need to tightly manage their risk, often cutting internal R&D and are reluctant to invest in the METS sector for new technology (Committee on Earth Resources et al. 2002).

With a reduced R&D budget, limited capital expenditure and a severe reduction in engagement of the METS sector, firms in the METS sector seek to continue to innovate and stay relevant to mining companies in this current and unfavourable mining economic climate. The traditional technology driven value proposition offered by METS companies is no longer applicable within the current market conditions. As contact with customers is dramatically reducing, the need to radically innovative METS companies seems a priority to remain engaged and relevant to the mining industry.

Design and Innovation

Traditional forms of innovation, particularly in engineering-driven companies, begin with technological solutions being developed and then pushed to the market. Design as an innovation mechanism is an iterative process to build value proposition maturity, by uncovering problems with stakeholders, not designing solutions for them. In this way, the innovation process is broken into analysis and synthesis elements, where the practitioner moves between the concrete and abstract worlds of understanding ([Beckman & Barry 2009](#)).

Design led innovation builds on this theory by internally aligning the solution with the company's strategy, resources and brand. Design and innovation as an organisational process cannot work in isolation of the organisational systems and the people that will deliver the resultant innovation. Design led innovation aligns corporate ideologies to fit and potentially leverage the company's internal capabilities, resources and brand (business model) in order to generate an innovative solution that creates a competitive advantage. This research highlights demonstrates how an innovation catalyst facilitated the link between the operational and strategic elements of a METS company, where company hierarchy, centralised decision-making and emotion play a role in the design-led change of a family owned company.

2 Research Design and Method

Action research was selected as a platform to engage with people within the organization to improve their capacities to solve problems, develop skills (including professional skills), increase their chances of self-determination, and to have more influence on the functioning and decision-making processes of the organization. Adopting an action research methodology, the researcher was embedded within the company over an 11-month period. This longitudinal research specifically investigated the barriers to design-led innovation and opportunities that developed throughout this research, to understand how the organisation and culture of the METS company evolved, to progress towards design-led change. Multiple data sources including semi-structured interviews, carried out in two distinct time periods, a focus group and a reflective journal were analysed using thematic coding and analysis.

Action research correlates with the journey of design-led innovation, as both require continuous and balanced engagement with the company in all stages of the cycle (Burns & Brown 2002). Action research, highlights how the researcher works through an iterative process of diagnosing the problem, planning the course of action, and taking action with the participants, evaluating the consequences of the action and specifying learning's, which in turn feeds the next evolution of the action research cycle in this longitudinal study.

Data Collection and Analysis

Data were collected according to action research methodology with semi-structured qualitative interviews at two distinct points of time, a focus group and a reflective journal. Data captured from these methods were analysed thematically for patterns that informed the barriers, opportunities and imperatives that resulted from a design-led innovation engagement. Data collection methods include semi-structured interviews with employees, and an ongoing reflective journal. Interviews were conducted with employees at two points throughout the research engagement: after three months and again after nine months.

The discussions conducted in these interview rounds were focused on identifying changes in perceptions of design and design led innovation by reflecting on the range of activities and interventions facilitated by the catalyst. Thematic analysis ([Miles & Huberman 1994](#)) was conducted on the combined data sets in order to identify the nature of responses and change processes in each firm and to compare changes over time. Data collection for METSCo included semi-structured interview initially with 15 employees

and later 20 employees, focus groups, thematic analysis and presentation of research to the company. Activities and interventions by the catalyst included capturing deep customer and stakeholder insights, applying these insights in operational and strategic dimensions of business and disseminating insights within company.

Detailed data collection and validation processes through testing out with staff on a regular basis increased the veracity of the findings and the value of this approach to the SMEs. This manufacturing company was established almost twenty-five years ago. Faced with changing external markets and market competition managers in these companies were aware that their past business success may not be sufficient in the face of growing inputs from China and Asia and were therefore seeking to refresh and improve their chances of survival as well as refocus with new operational and strategic directions for growth. The company participated in the Researcher in Business Program inviting the researcher to work with people in their firm to generate new insights about the firm and to assist them with strategic and operational directions. To maintain anonymity the company was named METSCo.

3 Findings

Company History

METSCo, established 24 years ago by the current Managing Director, is a medium sized company that employs 170 staff, with headquarters in Australia and with international sales offices. The company develops product and technology services, in a Business to Business context. METSCo had been founded by manufacturing a disruptive innovation for the mining industry and the CEO and Top Management Team were seeking the next disruptive idea to take this company to new horizons. A summary of case information is presented in Table 1.

Table 1: Summary of Case Study of Manufacturing Company

<i>Details</i>	<i>Company Information</i>
Age and Size	24 years; 170 staff
Locations	One Australian Headquarters with international offices
Business	Family business established by Managing Director
Company Focus	Product and technology services in METS, Business to Business
Company Engagement Purpose	Seeking assistance to innovate for growth in dynamic environment
Data Collection in 11 month action research project – multiple sources	Participant Observation Interviews with 20 staff, cross-section of firm at two time intervals Workshops and Focus Groups Reflective Journal
Activities and Interventions: Customer mapping	Capturing deep insights from customers and applying these insights in operational and strategic dimensions of business. Business Model Canvas; Value Propositions

Disseminating insights within company.

Organization Changes:	Build awareness of customer and customer into multiple aspects of business;
Shared Values,	Top Management team (TMT) focus on Customer Inspired Innovation;
Strategy,	Celebrate small wins;
Structure,	Knowledge from gathering deep customer insights, incorporating new understandings into TMT process;
Systems,	Seeking next disruptive idea;
Staffing,	creating cultural shift in company from technological focus to customer focus
Style,	
Skills	

Source: Developed from this research.

Exploring the Organisational Effects from a Design Led Innovation Intervention

Three levels of organisational change were identified as a result of a design led innovation engagement, with the researcher acting as a catalyst for change within the mining equipment SME. The design led innovation intervention achieved organisational changes within METSCo across three levels of its organisation; Leadership level, Management Level and Employee Level. Each organisational level highlights dimensions of company attributes at the start of the research project, and at the completion of the engagement. The changes in these views over time are illustrated by quotes from interviews.

The themes described at each organisational level indicate key areas of change and illustrate the implications that this research has had on the organisational shift toward being design-led, from leadership level through manager level to employee level. Changes observed throughout the organisation include the company vision, leadership, innovation, problem solving, and customer centricity - all demonstrate a shift from an engineering culture to a more inclusive new way of thinking and operating.

Changes at Leadership Level

Prior to the research project at METSCo, the Managing Director (MD) had already sponsored research into design-led innovation,

“wanting to find mechanisms to embed more of that (DLI) thinking more deeply into the whole engineering team so that the place wasn’t just dependent on (a few key people)”.

Participants saw the buy-in from the company leadership as crucial:

“The most successful change in this organization is directly sponsored by the M.D. So if he decrees something, then we all get into line and make things happen; if we don't, there is no other mechanism to make that happen”.

"The tone of the M.D sets the tone of the management team, who sets the tone of the business".

Organisational changes at the Leadership level were documented using baseline information that was collected by the catalyst with the first interviews and later compared to comments at the end of the catalyst's engagement, following the design led innovation intervention. Significant leadership changes in METSCo's approach at the leadership level related to the views on innovation, employee empowerment, leadership techniques and understanding of design and design led innovation. A summary of the themes at two points in time is shown in Table 2.

Approach to Leadership

Continuing support from company leadership is critical for any organisational change. Leadership within the company played an important role in design-led change, as METSCo is a family-owned business with a strong engineering culture. A strong embedded culture within a family-owned business is not uncommon, with a high level of emotional investment from company employees and leaders alike (Hall et al. 2001; Miller & Breton-Miller 2006; Sharma et al. 1997). This research demonstrated that company leaders facilitated and supported by the design team enabled their evolving experience of design-led change at a personal and philosophical level. Whilst this change in thinking was noted as challenging for an engineering mindset, public leadership on the reflection of this journey over the course of the engagement encouraged the company employees also directly or indirectly experiencing design-led change. Consistent public reflection from the company leaders generated company buy-in from the top down, by reporting on new insights and what they might mean for future innovation within METSCo.

Approach to Employee Empowerment

The vision and foresight of the M.D to implement the DLI project enabled not only the senior executives, but also all employees to take a customer-centric view of their job and their company. One employee stated that, *“It was his (the M.D's) realization about the first class product being beaten by second class business model that realization alone, is worth everything”*. As the company leader, the M.D is the culture leader and by disseminating his insights, encouraged and empowered the engineering-focused culture to look at innovation beyond technology.

Table 2: Changes to Organisational Approaches at Leadership Level

CHANGE AT LEADERSHIP LEVEL		
<i>Area of Change</i>	<i>Start of Engagement</i>	<i>End of Engagement</i>
Leadership focus	Managing Director with technological focus: <i>"fostered an innovative culture, but it's been quite a narrow innovation"</i>	Managing Director values customers insights: <i>"I am trying to reinvent my mindset. As my thinking has changed, I think in the past I have contaminated this customer-focused mindset"</i>
Employee Empowerment	Focus on technological development: <i>"Company BBQ's talk about how good engineering is at making a new machine, when tech's go to site and ...someone did 100 hour week on site helping customers etc. and no one sings their praise"</i>	Broad inclusion of staff across organisation: <i>"Embedding the voice of our customer into METSCo through the company BBQ...war stories from mine sites... hearing about our customers through our subsidiaries... not just stories of our own manufacturing successes...but stories of our customers' success with our products and services"</i>
Approach to Innovation	Innovation seen as new product development: <i>"Innovation has tended to be bounded, so its innovation in an engineering product type sense"</i>	Innovation across business model: <i>"12 months ago - conversations around alternate business models would not have gotten traction"</i>
Understanding of Design-led Innovation	Design limited to equipment: <i>"Others saw it (DLI) as trying to change the design of our equipment"</i>	Design from deep understanding of customers: <i>"Customer Inspired Design*, it to me, to me that says something, slightly less academic and slightly more real. For me it's more understandable and something that I feel bit more like it's something I want to chase"</i>
Approach to Customer	Customers not seen as source of demand. <i>"Does (the company) know its customer? No, flat out no. Its ignorant and almost arrogant towards its customer"</i>	Customers seen as crucial for innovation: METSCo now employees two ex-customers/stakeholders for internal customer knowledge
Customer-Facing Resources	Few resources for customer interface: 12 customer facing employees	Investment in customer insights: three customer facing employees with four senior relationship managers
Approach to Design-Led Change	Leadership buy-in as a result of a prior design change program	METSCo passed a board-level directive which supports the company in taking a <i>customer- inspired</i> focus

**Customer Inspired Design is the internal rebranding of DLI within METSCo*

Approach to Innovation

As a result of the DLI project, METSCo identified new opportunities to exploit, to enhance their strategic development with a newfound perspective of innovation.

“A business model is an opportunity, a product is only a fraction of what we now know we can get, and it is almost an embarrassment”. The perspective of the M.D “Has matured from the DLI process... for sure it’s been part of the catalyst of maturing a vision, which has certainly changed my attitude toward (moving into new areas of innovation)”.

In gauging the impact that the DLI project had on his management team, the M.D continues that design-led innovation *“Must be there to a greater decision or lesser degree in all the decision makers in (our company). They must have absorbed something, because we couldn’t be going down the directions with the authority that we’re going down these directions”*

Approach to Design Led innovation

Early engagement with design-led innovation by managers was a direct result from the M.D’s belief in it, highlighting the importance of having top-down leadership engage in and communicate their personal understanding of and developments with design-led innovation. This finding highlights the important position leaders have within family owned business and how active communication of their own personal discovery of design-led innovation can promote and encourage change organisation-wide.

Summary

The ability for company leaders to make sense of design-led innovation, to see the potential of value and to be able to communicate this ongoing understanding, triggers a leadership culture change that is imperative for the implementation of design-led innovation within this METS company. The empowerment derived from this culture change is an enabling factor for the wider METSCo cohort to seek to experience design-led innovation first hand.

Change at Management Level

Company management and employees initially respected but also questioned the practical value that the design-led project was delivering to METSCo. While the company leaders were evolving their theoretical understanding of design-led innovation, the managers of METSCo began engaging with design tools and design thinking as a way to rapidly prototype businesses models in a rapidly declining economic environment. This hands-on practical experience of the managers with design-led innovation helped employees overcome barriers in design language and speculation on its theoretical application. Evidence that highlights management based organisational changes were documented as a result of the design led innovation intervention are shown in Table 3.

Initially, design-led innovation was seen as ‘invisible and slow’, however with the shift of the design team to facilitate employee change, and with the management team more confident in how design applies to a manufacturing business, a more customer-centric mindset formed, evidenced through the sharing customer insights, business model design and prototyping.

Table 3: Changes to Organisational Approaches at a Management Level

CHANGE AT MANAGEMENT LEVEL		
<i>Area of Change</i>	<i>Start of Engagement</i>	<i>End of Engagement</i>
Approach to Problems	Problem solving focused on solutions. <i>"The whole culture of problem solving by engineering solutions is very serial, tightly defined with scope. Without asking the questions about what the problem is"</i>	<i>Multiple dimensions and perspective of problems and opportunities</i> <i>"We've started working on a service offering, where we profile the customer and we're trying to continue the prototyping loop where we're debriefing our sales staff at the moment, and just making general notes on those"</i>
Approach to Market Scope	Well-defined view of market. <i>"We have really tapped out the current potential for our product with our current business model"</i>	Broad view of market and business. <i>"A business model is an opportunity, a product is only a fraction of what we now know we can get, it is almost an embarrassment"</i>
Approach to Business Prototyping	Traditional view of prototyping with one solution. <i>"Get all of our ducks in a row before we can go and talk to customers"</i>	Rapid prototyping to test ideas not only end points. <i>"That wasn't so bad. That didn't hurt us by putting something to market that wasn't totally 100%."</i>

Source: Developed from this research

Approach to Problems

A core element within the strong engineering culture within METSCo is the ideology that technology is central and that engineers are the producers of technology (McIllwee and Robinson, 2007). For METSCo to be able to deliver innovative solutions that create customer value, gaining an agreement and commitment to an organisational and cultural perspective, that allows and supports a strategic shift was crucial. As one participant notes,

"The first step is knowing the customers, but then if you've got to change internally, how do you do that?"

This organisational change perspective is commonly raised in academic literature with regards to business model innovation (Zott & Amit 2010), strategy (Pascale & Sternin 2005; Porter 1996), and design-led innovation implementation (Matthews et al. 2012; Pozzey 2013), highlighting its necessity to achieve and sustain breakthrough innovations.

Approach to Market Scope

While the pressure of the declining mining cycle was forcing METSCo to change and look at business differently, it was the awakening of senior executives to customer

pressures that enabled the value of design-led innovation to be understood and experienced.

Approach to Business Prototyping

Evidence supporting METSCo's managers actively using prototyping design tools by themselves and without facilitation, highlights a catalytic event in METSCo's journey toward being design-led. Supporting this finding, participants highlight the importance of this event in their own personal development with design-led innovation theory.

Summary

Active engagement of employees at all levels with design-led innovation, using tools and theories, and allowing their experiences became the driver for continuous change in was clearly demonstrated. From a company that was initially focused on technology innovation, METSCo was beginning to see how design-led innovation had begun to change a engineering culture toward the customers 'job to be done', allowing the employees to gain new knowledge understandings from first hand experiences to drive change internally.

Change at Employee Level

By developing and managing design thinking capabilities with customer-facing staff, the DLI team was able to gain significant customer insights second-hand, whilst encouraging and empowering these employees to begin to analyse the market in new ways. Evidence highlighting employee based organisational changes documented as a result of the design led innovation intervention are shown in Table 4.

Approach to Design Language

METSCo demonstrates understanding of the industry and their customers through informal communication practices between employees. Participants described as 'tribal knowledge', the variation in how information is understood by the METSCo employees providing and receiving this knowledge. This sensemaking is an issue of language, talk, and communication where situations, organizations, and environments are talked into existence" (Weick et al. 2005). Design-led innovation sets out to, "ground stakeholder conversations around future propositions which aim to synthesise needs, technologies and possible business models" (Bucolo & Matthews 2011b).

Design Thinking Capability

The role of the catalyst within design led innovation is to use design thinking to "translate and facilitate design observation, insight, meaning, and strategy into all facets of the company" (Wrigley & Bucolo 2012, p.8)). Design thinking is built upon 'abductive reasoning' (C.S Pierce as cited in Cross 1982; Martin 2004; Martin 2007; Martin 2009) by adding creativity to form new knowledge. Access to customers in remote areas is limited within the METS sector, where the catalyst is unable to effectively facilitate and conduct design observations of the market and to co-design with customers.

Supporting Customer Engagement

The customer-facing employees of METSCo were not well resourced, and traditionally were not encouraged to engage in reflective observation of customers to gather information.

Table 4: Changes to Organisational Approaches at an Employee Level

CHANGE AT EMPLOYEE LEVEL		
Area of Change	<i>Start of Engagement</i>	<i>End of Engagement</i>
Approach to Design Language	<i>“In the early days when you do not understand the language or the perspective. It’s painful, it’s tough”</i>	<i>“So, we’re much more comfortable with that language now. We understand what it means to touch it”</i>
Design Thinking Capability	<i>“I don’t think the people talking to the customers and finding out what they need are the same people as the people who can strategize on what innovations we should come up with, I think they’re two very dissimilar people”</i>	In prototyping design management capabilities with customer facing employees, one employee noted: <i>“Once I had a customer insight, it all made sense”</i>
Supporting Customer Engagement	<i>“He thinks that if I went in front of a customer I would mess it up. Some people are very protective of having people on their turf”</i>	<i>“But I think it has changed what I got to offer the customer and the backup I have behind me. Now I feel like I can go to my boss and he can go to his boss and I feel like we are a bit more on the same page”</i>
Approach to Knowledge	<i>“Someone may or may not look at that bit of information, so yeah, other than diligence and good communication it doesn’t get distributed. There’s a lot of tribal knowledge”</i>	<i>METSCo employees now share knowledge and actively discuss insights, reflect and distribute customer information through the organisation.</i>
Departmental Alignment	<i>“Just in my space, and I’ve found it quite difficult, you’ve got a job to do, and everybody within the organisation’s pushing back”</i>	<i>“We feel like on our area we have the support of the other side of the business. That is a definite change of the last 6 months or so”</i>
Approach to Customers	<i>“We know what our customers want- speed and reliability – reasonable price”</i>	Deeper understanding of customers using design tools. <i>“What personas did for METSCo, is ‘You know what, we should probably talk to our customers before we make decisions,’ and I think that was a hugely important piece of activity”</i>

Source: Developed from this research

Due to the complex and remote nature of the mining industry, the catalyst relied on the assumptions created and tested by the customer-facing employees and the primary source of customer insights, from where new business concepts are generated. Schön’s (1983) seminal work describes a theory of knowledge as a thought process through human

perception, or a ‘reflective conversation with the situation’; where problems are framed in order to take action to gain clarity around a situation (Bucolo & Matthews 2011a). "Competent practitioners usually know more than they can say" (Schön 1983, p.8). Observationally, this work was seen as valuable to rigorously understand METSCo assumptions around customer needs, highlighted in literature as a key feature in business model innovation (Casadesus-Masanell & Ricart 2010; McGrath 2010; Teece 2010). However, the ability to test, validate, or disprove these assumptions was limited by the personal capabilities of customer-facing employees who were not trained in divergent learning, or design thinking.

Departmental Alignment

The recognition of the importance of customer observation gave a level of respect to the catalyst and to design-led innovation, as the customer-facing employees felt that METSCo was finally listening to them. This recognition of the value and need for customer insights allowed these employees to develop a different understanding of the role of the catalyst, the project and design in general. The realisation of employees of the potential that channelling of customer information and insights into METSCo could have on their job, their interaction with their colleagues and ultimately their customers, emerged in the focus group. The customer-facing employees were able to provide input on customer situations and communicate through their reflective knowledge, enabling the DLI project to effectively build multi-perspective observations second-hand.

Approach to Customers

The shift in the DLI team from a ‘doing’ role to a position of facilitation, whereby design thinking could be engaged, prototyped and disseminated with the customer-facing employees, enabled new insights to be fed into METSCo, allowing lower-level employees have an input into the strategic design of their company. Prototyping as a mechanism for customer facing employees to bring customer insights back to the catalyst was crucial for the DLI project to continue moving forward. The purpose of this prototype was to engage customer-facing employees of METSCo to work through design methods whilst at mine sites, to generate customer insights and reflect on them with the catalyst.

Summary

The face-to-face interaction and communication with mining customers was a significant factor in changing perspectives. METSCo had traditionally given priority to establishing and maturing organisational processes to support their primary business in meeting market demand. Engaging customer facing employees to prototype holistic forms of knowledge management demonstrated: 1) that METSCo showed commitment in capturing and translating customer insights and 2) that developing their understanding of the importance that customer facing employees play within such a dispersed and isolated industry. By developing employee and management capabilities in ‘design thinking’, METSCo began to holistically address its customer insight processes with an employee knowledge base that was empowered and capable of delivering new knowledge.

5 Discussion and Contributions

While the benefits of design management programs where design consultants have used processes and methods to assist firms to capture deep customer insights, restructure the business and increase the firm's competitiveness have previously been seen (Hollinger 2012) there is scant research that investigates the use of designers undertaking action research projects as innovation catalysts embedded in small and medium enterprises in the manufacturing sector.

Our findings show that an SME that embraced a design led innovation responded to the embedded catalyst using design led innovation processes and practices to explore and learn about their customers, to capture these insights and reconfigure their capabilities to deliver new more strategic directions and increased competitiveness. The findings from this study contribute to a deeper and broader understanding of the implementation of design methods and process as contributions to strategic renewal of SMEs.

6 Contribution and Practical Implications

This research contributes new knowledge regarding the possibilities that design led innovation brings to organisations seeking to continuously innovate in dynamic markets. It also highlights the important role of designers as innovation catalysts in building strong links to existing and potential customers. Working with the company and engaging and educating organisational members with design tools and approaches through direct experience has taken the company some distance on the journey with design led innovation. New perspectives and new knowledge and understanding of the practical application of various methods of the design-led innovation framework, and their positive impact on the firm's interactions with customers, the generation of new opportunities and effect on the company's uptake.

This research has practical implications for the firm as a whole and for designers engaged in design-led innovation. The researcher undertaking action research was positioned as an active member of the company, a translator of information from customer insights and a contributor to organisational change. Companies engaged in a design-led program have to develop strategies for capturing the value from new knowledge generated through customer insights. The designer innovation catalyst gathered and generated meaning from the customer insights. In addition they developed employee capability with customer-facing employees, who were the main direct contact with the customers on mine sites, shaped new initiatives for the business and facilitated the translation of customer insights into meaningful business opportunities. Designers as innovation catalysts have been shown to be well-suited to facilitating organisational transformation through design led innovation.

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