Design for manufacturing competitiveness

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Contents

The Future is Now

Manufacturing in Australia is currently under stress, but it's not all doom and gloom, we have the opportunity to change.

This report has taken a representative group of companies that exhibit the qualities required to prosper. The success of these companies whether they are starting out, in transition or looking to grow can be attributed to a mindset that sets them apart; this allows them to understand their customers, allocate their resources more efficiently and effectively and develop export opportunities. These factors of success make up what we have termed "design led innovation".

We must all learn from this insight and design a better future.

Executive Summary

Manufacturing is essential to a diverse, resilient, world-class economy that provides more jobs, higher wages and more choices. Australia is a high cost place to do business. Domestic and international economic forces are driving ongoing changes that require many Australian firms to transform themselves, reduce their input costs and efficiently supply what markets demand.

Australia's manufacturing industry is predominantly small and medium sized enterprises that, for the most part, are not integrated into global value chain markets. High value manufacturing focuses on the firm managing its intangible assets of brand and image, research and development, intellectual property, market intelligence, product/service packages, marketing and logistics, customer relations management, and its human and organisational capital.

To remain competitive, many Australian firms need to transition from their traditional business models to those centred on high value-added product and service 'solutions' that compete on value rather than cost alone. A design led innovation framework offers one way of achieving this.

This framework builds upon the notion that design is an activity that focuses on conceiving and developing a plan for a new or significantly improved product, service or system to best meet users' needs[1]. Design goes further than just creating value. To capture value from the new product, service or production system the firm has to give greater attention to its overall design to ensure more purposeful alignment of its internal organisation, processes, business model and culture with customers' demands.

The framework's five core principles are: 'Clarity of purpose', 'Become your market', 'Be a disruptor', 'Integrate your business model' and 'Own the change experience'. The application of this framework is undertaken through a design lens.

This report provides advice to help firms adopt a more strategic approach to redesigning themselves for competitiveness in constantly changing markets. This means adopting and adapting new management and leadership capabilities to help them use innovative business models, techniques and skills, develop new products and assess markets within a strategic framework.

This report is founded on an evidence based analysis of fourteen high performing, globally competitive Australian manufacturing firms. These firms use design in its broadest sense to create and capture value, and are designing and developing products as diverse as mining equipment and microphones (RME and RØDE); furniture, food and footwear (Sebel, Gourmet Garden, Haigh's Chocolates and Rossi Boots); plumbing and marine products (Enware and Superior); machines, automotive components and ventilation systems (ANCA, Futuris and IVR Group); and building products, safety ladders and electronic equipment (Centor, Branach and Codan).

These firms are purposeful and methodical in their application of design principles to all aspects of their organisation. They use up-to-date production techniques. Their highly skilled professionals and tradespeople work in modern surroundings and are led by innovative managers.

New management and leadership capabilities are needed to identify and apply new business models, technologies, processes, practices and skills. This report's advice will help other Australian firms to remodel themselves in adopting these new capabilities.

[1]European Design Innovation Initiative (abridged common language version using from refer http://www.oxforddictionaries.com/definition/english/design, http://ec.europa.eu/enterprise/policies/innovation/files/design/design-for-growth-and-prosperity-report_en.pdf pp 15, 77)

Design Led Innovation Framework

Clarity of Purpose

Organisations need to have a clear purpose, which is communicated openly internally and externally to ensure cultural alignment.

Become Your Market

Organisations need to immerse themselves in the world of their customers, and their customers' customers, and stakeholders to achieve key competitive insights resulting in opportunities for market disruption.

Be the Disruptor

To be globally competitive, organisations need to create business models that envisage markets and services as well as products.

Integrated Business Model

Organisations that innovate through integration along the value chain will be globally competitive.

Own the Change Experience

Organisations need to be dynamic, agile and flexible and embrace change in order to remain relevant in the face of global competition.

Underpinning the practice of these framework principles is the application of design – a 'design lens'. This design lens encompasses common practices utilised within design:

- Reframe your purpose – challenging what is accepted and creating new ways of looking at the situation
- Envisage – creating visions of possible futures
- Exploring – taking licence to experiment and explore possibilities
- Prototyping – thinking by doing in fast iterative cycles
- Questioning and learning – curiosity accompanied by reflectiveness

Foreword

As the patron of the recently formed Australian Design Integration Network, I am proud to be able to lend my support to this important report "*Design for Manufacturing Competitiveness*".

This report points to significant evidence from across the globe that design-led innovation is a way in which many countries are looking to improve their economic well-being. However, what is unique in this report is that this is the first time that the voice of industry has been used to inform our understanding of the way a company's competitiveness can be enhanced by looking at its activities through a design led innovation lens. Design led innovation is a term that is starting to gain widespread adoption, and this report provides the necessary clarity as to its role and value; specifically in addressing the issues surrounding the challenges the manufacturing sector is facing.

The companies that have given up their time to be included in the report are to be applauded for their efforts. They are truly champions of Australia's manufacturing sector; leading the way in demonstrating that they are not bound by tradition, and willing to "give it a go" when looking at innovative ways to compete on a global stage.

What is clear from the findings in the report is that the adoption of design led innovation must become mainstream if Australia is to address the challenges of the structural economic shifts the nation currently faces. To achieve the necessary broad based adoption, design led innovation principles will need to be incorporated throughout education and in industry practice.

Design led innovation is not merely a set of tools for firms to adopt, but a mindset embedded inside the culture of firms and within the stakeholders who support them. We will only see evidence through case studies and to do this, there will be a need to support firms who become early adopters and learn from their experiences. This is a long term strategy for Australian manufacturing and if followed with encouragement from congruent policy settings will ensure that manufacturing continues to be an important part of the Australian economy.

Catherine B. Livingstone AO

Patron of the Australian Design Integration Network

Professor Sam Bucolo

It is clear that the manufacturing sector requires a fundamental shift for it to remain competitive and relevant. Addressing this issue requires a national response and it is the responsibility of each citizen to ensure they contribute to finding solutions that enable growth and drive Australia's competitiveness. As a design practitioner and academic I have constantly striven to demonstrate the value of design to drive competitiveness. However in order for design to remain relevant, my sector will also need to shift to continue to support manufacturers.

It has been my honour to work with Peter to draw together many different research threads and present a role for design to drive manufacturing competitiveness. Along this journey I have met with a dedicated sector that is committed to ensuring the longevity of manufacturing in the country. Although the debate among this stakeholder group is often intense, I have witnessed a commitment to collaborate and find a common ground. I hope that this report will assist in building on the collaboration within the sector and provide the necessary clarity as to how design can continue to make a significant contribution to the manufacturing sector.

Peter King

Through undertaking this project I have taken pause to reflect on the potential that exists for Australian manufacturing in the face of significant challenges. I would like to think that by adopting design led innovation in Australia we have a chance to stem the decline that has been apparent in Australian manufacturing and to grow new and exciting opportunities. It is also clear to me that Australia's leading companies recognise this and understand that in order to compete or grow there has to be change.

With this in mind Sam and I have been keen to ensure that we build a narrative that compels action, builds capacity and provides markers that can assist Australia in moving forward to create a new future by bringing together and integrating the energies of all in Australia's National Innovation ecosystem; industry, higher education, government, publicly funded research agencies and the community.

We need to harness and build on the enthusiasm of the fourteen champions who shared their stories with us and celebrate Australia's successful companies.

Introduction

Background

The broad professional disciplines of design are a key stakeholder in enabling the manufacturing sector to compete. Design can assist manufacturers in the development of new products or services, the creation of graphics and communications, the development of physical environments, new product interfaces, and efficiency related activities. Due to the breadth of activities that may be termed 'design', there is no single definition, however the following definition is intended to provide a starting frame of reference. *Design is what links new ideas and the successful exploitation of these ideas. Design shapes ideas to become practical and attractive propositions for users or customers. Design may be described as creativity deployed to a specific end* (adapted from Cox 2005). The foundation of this report is the focus of design as a mindset which allows you reconceptualise what can be, whether this be a product, service, system or organisation.

Purpose

The purpose of this report is to provide advice to help firms adopt a more strategic approach to building their competitiveness in order to transform themselves as global and domestic markets change. This means adopting and adapting new management and leadership capabilities to help them use innovative business models, technologies and skills, develop new products and access markets within a strategic framework.

Aims

This report aims firstly to contextualise what changes the manufacturing sector needs to undertake in order for it to remain globally competitive, and then to clarify how design may best add value to the sector as it makes this transition. This report aligns its view of innovation to recent international studies that suggest businesses are adopting new models of innovation which focus on integrating business activities aimed at capturing value within a global context.

The basis for this publication is three-fold:

1. Provide clarity to the term 'design led innovation' by contextualising its opportunity within the Australian manufacturing sector by drawing on existing research and industry case studies.
2. Highlight a number of practical tools which firms can consider to enhance their competitiveness within a design led innovation lens.
3. Frame the path to long-term, broad based adoption of design led innovation by industry.

Audience

The main audience of this report is industry – SME manufacturing in Australia. SME's are defined by the Australian Taxation Office as any business or company defined by its revenue being below $20M. The intention is to begin the conversation with business by faithfully reflecting the industry perspective, building awareness of design led innovation and developing ways to adopt this approach long term. It is intended both for public and private enterprise and also provides a framework for those in government policy, providing evidence-based advice to guide federal and state government strategy and investment.

Evidence and Analysis

The design led innovation framework (the "framework") we have developed in this report is grounded in evidence from fourteen (14) Australian manufacturing organisations that are globally competitive. The data gathered from the 14 organisations has been augmented by a series of nationwide workshops with stakeholders of the manufacturing community to ensure the key practices resonated with a broader cross-section of the sector. A total of 6 workshops were held, with over 250 registered participants contributing to the evolution of the findings.

The outcomes from this engagement with industry resulted in identification of five key themes that represent activities which need to be adopted at the firm level in order for the industry to drive global competitiveness. These themes are:

- ***Clarity of Purpose***

  Organisations need to have a clear purpose, which is communicated openly internally and externally to ensure cultural alignment.

- ***Become Your Market***

  Organisations need to immerse themselves in the world of their customers, and their customers' customers, and stakeholders to achieve key competitive insights resulting in opportunities for market disruption.

- ***Be the Disruptor***

  To be globally competitive, organisations need to create business models that envisage markets and services as well as products.

- ***Integrated Business Model***

  Organisations that innovate through integration along the value chain will be globally competitive.

- ***Own the Change Experience***

  Organisations need to be dynamic, agile and flexible and embrace change in order to remain relevant in the face of global competition.

It is by looking at these themes through a design lens that the value of design led innovation becomes apparent. The companies that we interviewed utilised what we would term, a design led approach, to allow them to capture value from their efforts. This is a significant point of departure from more traditional ways of understanding innovation.

Report Structure

There are three main sections of this report which form the intended narrative for the reader.

1) Manufacturing Innovation Transition and a Role for Design

In this section the case for design led innovation is made by framing the innovation shift that manufacturing needs to undertake. Based on secondary research the sector needs to transition from making things to focusing on capturing value through the integration of internal activities, emerging technologies and new business models. Through this understanding of innovation the role and value of design can be revealed.

2) Defining the Design Led Innovation Framework

Section 2 highlights the key themes that differentiate firms as competitive leaders within the sector as found through the evidence based study of leading Australian firms. These themes embed a design practice which when applied to the key themes provided our definition of design led innovation. To assist in the understanding of this definition, a retrospective case study on Cochlear's first pivotal development has been included to demonstrate how all these elements work together to produce game changing results.

3) Conclusions and Next Steps

Section 3 provides a framework for broad-based industry adoption incorporating these learnings along with industry views captured along the process.

Study Methodology

Outline of Methods

The approach to this study has been a multi-method approach using a mixture of qualitative and quantitative techniques to elicit a deep understanding of the traits and practices of organisations within the SME sector of Australian manufacturing. The methods comprise a literature review, interviews, survey and workshops as well as a case study to highlight the findings. This study is pre-dominantly a qualitative one with rich information gathered from in-depth face to face interviews with leaders in the chosen organisations. This data was augmented with a more quantitative survey of the workshop participants which sought to clarify the themes identified by the interviewees and capture a broader industry perspective.

The strategic intent behind this study and the approach we took was to actively involve industry in the process so that the sector itself can inform the establishment of a future direction and embed capability nationally. Shared stories from industry will inform a national framework aimed at establishing long-term adoption of design led innovation to sustain and build on industry competitiveness. Additional data and analysis that informed the study outcomes are included in Appendix 1.

1. Literature Review

To contextualise the Australian manufacturing story and its strengths and challenges, a review of relevant international and local sources was undertaken. The literature sheds light on trends in Australian manufacturing performance as well as the role of innovation in global competitiveness. The literature review is multi-disciplinary incorporating reports from the fields of economics, design led innovation, manufacturing, science and technology. In addition to the material the report has directly referenced in the bibliography, we have also added links to additional resources to assist in further understanding design led innovation, which are included in Appendix 3.

2. Interviews

To illustrate how design can be used for manufacturing competitiveness, we chose fourteen (14) organisations across Australia who were identified as industry leaders in the SME manufacturing sector. In the selection of firms, we wanted to ensure a breadth of company size (revenue and staff), manufacturing sector type, export focused, longevity and geographical location. Our research sought to understand the reasons behind their successes and how these may be translated into guidelines to help other organisations around Australia become more competitive.

All organisations were interviewed using semi-structured interview techniques focusing on how they had achieved competitiveness through innovation and what challenges they had faced, as well as what measures had led to success. Questions aimed to elicit information about how design had driven innovation within each organisation and how value is created and captured.

3. Themes

The interviews were analysed to identify themes/principles that best illustrated how organisations viewed the practices that contributed to their competitiveness in the sector. Eight broad themes were initially identified as being significant to the sample organisations on their innovation journey and these were used to plan the workshops.

4. Workshops

Six (6) workshops were run across Australia in Melbourne, Sydney, Brisbane, Hobart, Adelaide and Perth utilizing a range of networks including those from CSIRO, UTS and the AI Group. Over 250 participants registered to attend these sessions. At each session, the themes identified in the interviews were presented to workshop participants for discussion and refinement.

An online survey was also undertaken by 135 of the workshop participants to understand more fully their understanding and application of design within their companies and the factors that improved their competitiveness. The results from the survey were also used to identify the key themes from a broader industry perspective. Further analysis of the workshops and the survey can be found in Appendix 1.

Identification of 5 key principles (Design Led Innovation Framework)

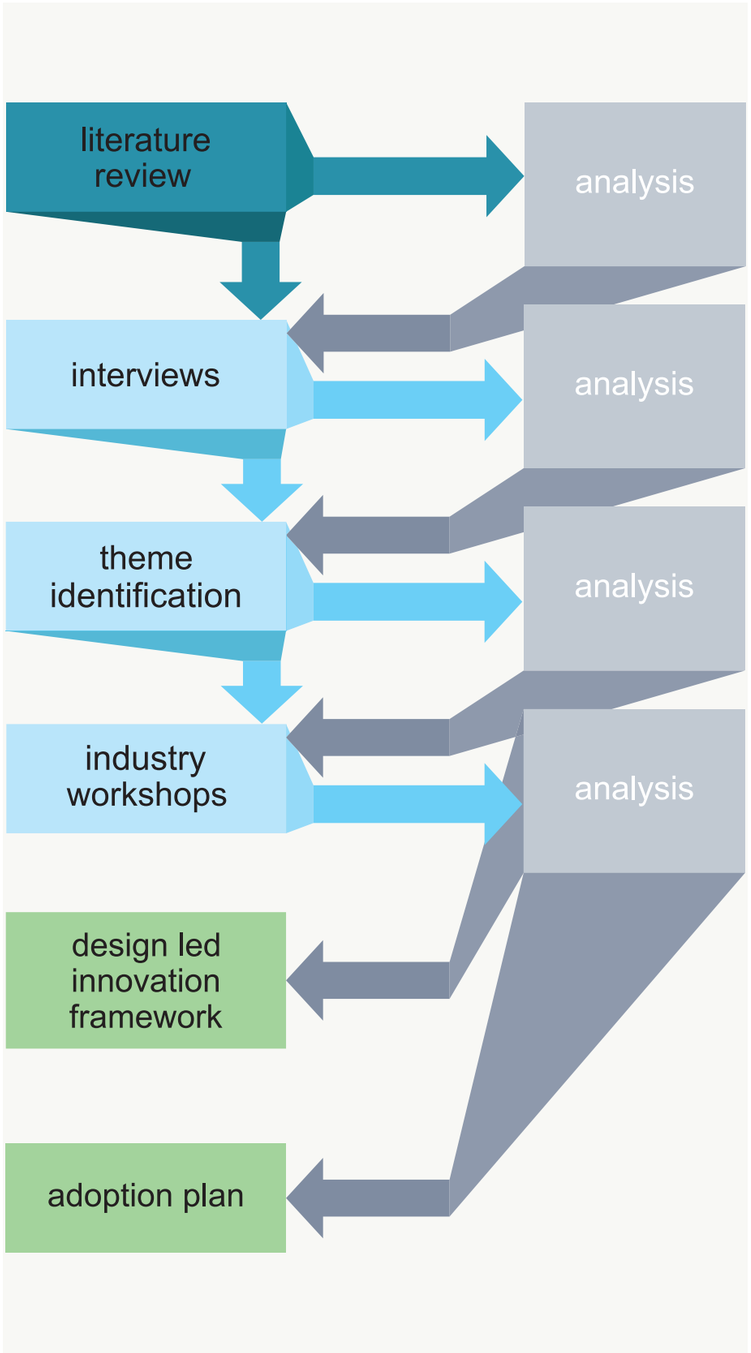
Following receipt of feedback from workshop participants it became apparent that the original eight themes could be adapted and refocussed into five principles to ensure global competitiveness in the manufacturing industry.

To exemplify the adoption of the five key themes Cochlear was chosen as a case study to illustrate how application of these themes can increase global competitiveness. Interviews with 6 key figures from the organisation were undertaken and analysed. This case study demonstrates the dramatic transformation from a technologically innovative business to a customer focussed market disruptor.

6. Adoption Plan

Following development of the framework, an adoption plan was formulated to scale up and promote wide scale adoption.

Our process



1) Manufacturing Innovation Transition and a Role for Design

It is clear that the Australian manufacturing industry needs to make changes to compete in a globally changing economic landscape. This section sets out why the sector needs to transition to new models of innovation and how design can support the sector going forward. The act of innovation cannot be limited to product design or technology improvements but should be applied to all aspects of the business.

The section outlines how manufacturing firms need to incorporate designing for creation and designing for value capture. There are challenges that need to be overcome to facilitate this. A greater level of business sophistication is required to make this happen, particularly in the level of management capability. Building design led innovation skills throughout the business has the potential to address this management capability gap.

Industry Context and a Role for Design

This first section explains how and why the Australian manufacturing sector needs to transition to new models of innovation. It will look to identify how design can support the sector as it strives to drive its global competitiveness.

The relationship between the professional design disciplines and the manufacturing sector is well established. In very general terms, the design professions have traditionally enabled the manufacturing sector to grow through the development of new products and services, the creation of unique customer experiences and product interfaces, the development of brand promises and communications. This ensures product differentiation and the development of spaces and environments which allow products and services to be experienced. Beyond the restrictive view that design focuses on the development of new product and services, design can assist the manufacturing community through a process that:

- accelerates time to market
- improves cooperation among agents
- changes relationships with suppliers
- improves coordination between marketing and production
- creates a new markets
- develops care for the customer in innovation
- generates technology transfers
- allows the company to sell at a higher price
- contributes to benefits perceived by consumers (Mozota 2002).

The Australian manufacturing sector has played and continues to play an important part in the economic environment. SME manufacturers – the subject of this study – form a large proportion of the sector overall, employing over 567,000 Australians and contributing 48% of manufacturing GDP (ABS Australian Industry 2011-12). The industry strongly reflects the Australian characteristics of resourcefulness and pride in quality: many of these businesses are family businesses, having started from very little and handed on between generations.

Generally, there is consensus that Australian manufacturing is a highly efficient sector as evidenced by its ongoing resilience and modest growth in difficult conditions; and, additionally, that manufacturing firms are responsible for a significant level of current technology-based R&D, although this lags behind our competitors.

Challenges include:

- Australia produces a comparatively low proportion of high technology in primarily niche application areas.
- Industry faces challenges from an ongoing resources boom, high labour costs and an uncompetitive exchange rate.
- Emerging economies are expected to dominate manufacturing in the near future with an associated decline for most developed economies.
- In contrast, Australia's performance has stagnated – in the face of fierce global competition.
- Global manufacturing trends include a move toward distributed global value chains, fragmenting customer demand, increasing skills gap and high technological changes.

The decline in performance of the manufacturing sector has contributed to the overall decline of Australia's global competitiveness. Competitive economies drive productivity enhancements that support high incomes by ensuring that the mechanisms enabling solid economic performance are in place (see the World Economic Forum Global Competitiveness Index – GCI). For advanced economies such as Australia (categorised by the GCI as 'innovation driven economies'), greater emphasis is placed on these capabilities relating to business sophistication and innovation as drivers for maintaining competitiveness. While Brazil and Asian economies are expected to dominate over the coming years, in contrast to its regional neighbours Australia is expected to decline in competitiveness.

It is clear that the Australian manufacturing sector needs to make changes to compete in a globally changing economic landscape. Adopting new forms of innovation to identify how design can continue to support the sector will be key to ensuring Australian manufacturing remains competitive. In 2012, 15 of the European Member States included design as part of their innovation policy settings with 12 countries having active design support programmes (Whicher et. al. 2012):

The Design Policy Monitor report identified the difference in company spend on design programmes compared with R&D across European countries. In the UK, companies spend 2.92% of GDP on design and 1.07% on R&D. In Denmark, Finland and the UK, more companies engage in design activities than innovation activities. In contrast, governments on the whole favour R&D over design as a driver of innovation – this raises the question of whether increase in government expenditure on design policies and programmes could leverage greater innovation capacity in organisations relative to public investment in R&D (Whicher et. al. 2012).

As SMEs in Australia strive to recognise, assimilate and apply design led innovation practices, they face the challenge of having the absorptive capacity to develop such capability. From our discussions with industry, it appears many SMEs in Australia fall into this category. It will only be through recognition that this is indeed a widespread issue that we can take action to remedy the situation so SME's may fully reap the benefits from adoption of design led innovation.

We must act then, to build up the absorptive capacity of Australian SMEs through a concerted and coordinated effort that includes short and longer term measures and an integrated program of awareness raising, capacity building and incentivisation. Indeed, the need to act on this issue has been recognised by Australia's industry department (Kemmis et. al. 2008).

Innovation for Growth and Productivity

The practice of innovating is essential for long term competitiveness for any business. Innovation brings more sustainable competitiveness. (The Global Manufacturing Competitiveness Index 2013)

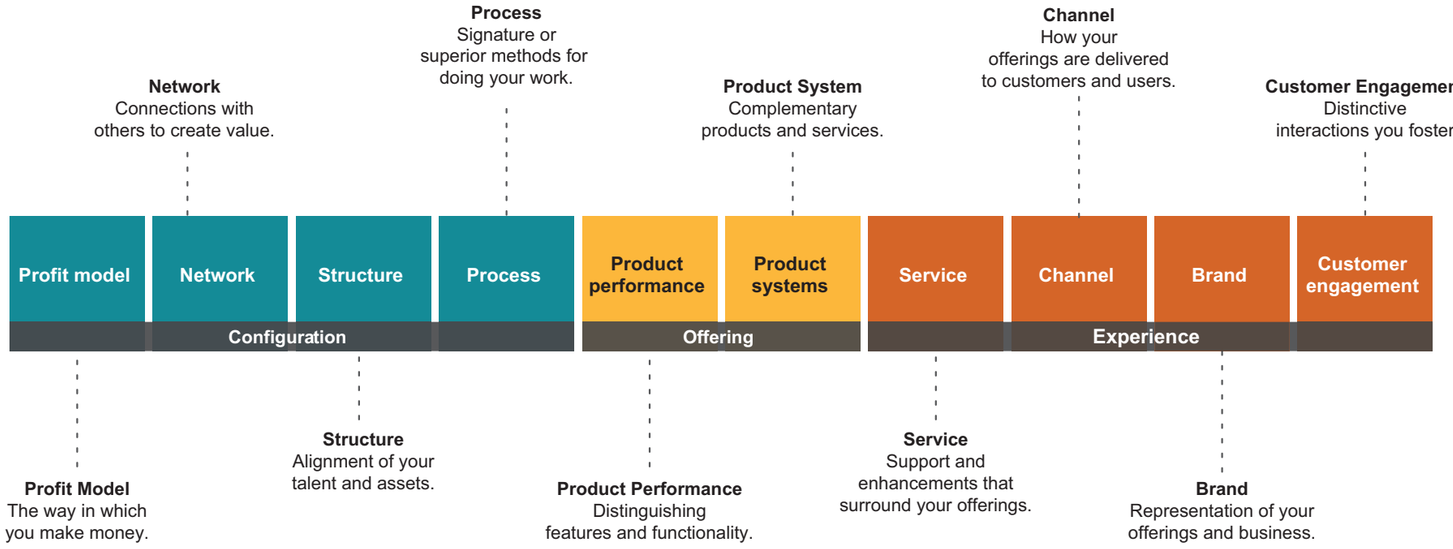
The act of innovation is not limited to product design or technology improvements alone. Innovation may be applied to all functions of a business. As noted in a recent NAE report *"A new paradigm is needed for making value, which is larger than 'making things.' Making things (i.e., manufacturing) is often an important part, but making value requires an integrated system of understanding customers, R&D, design, manufacturing, and the delivery of products and services."*

Doblin's *10 types of innovation* (Keeley et. al. 2013) maps organisational innovations through a typology illustrating various ways a business may innovate; these range across the product offering itself, the configuration of the business internally and within the external value chain, and the customer experience. In particular, these findings show that innovations around business configuration and experience bring greater business benefits than investment in R&D. Concentration of innovation efforts by businesses in general in the last 10 years have however focussed more on the offerings which bring lower returns.

This does not mean that R&D investment is redundant. As shown in the top innovator performance graph, the most innovative firms use innovation strategies that span value creation and value capture. In 2011, the innovations of 2 groups of companies were analysed in accordance with the Doblin system of categorisation. One group featured "average innovators", contrasted with the second group comprising "top innovators". Average innovators were found to use a lower number of innovation tactics (1.8 types) and tended to gravitate toward producing simple innovation. Top innovators integrated twice as many types of innovation (3.6 types) in their business practice compared with the average firms. In doing so, top innovators created more robust and defensible offerings.

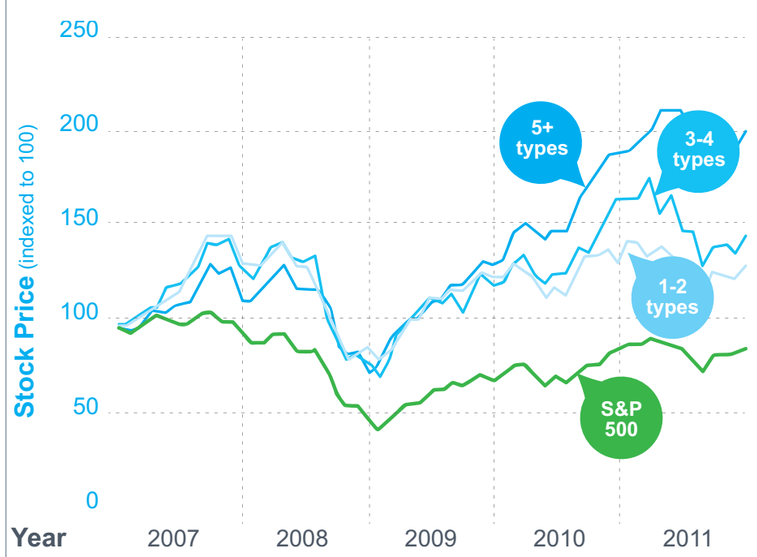
We can therefore reasonably conclude that the best results occur when innovation tactics are intelligently combined to generate greater business versatility and resilience. This presents a clear opportunity to leverage existing R&D spend within the Australian manufacturing sector.

The ten types of innovation



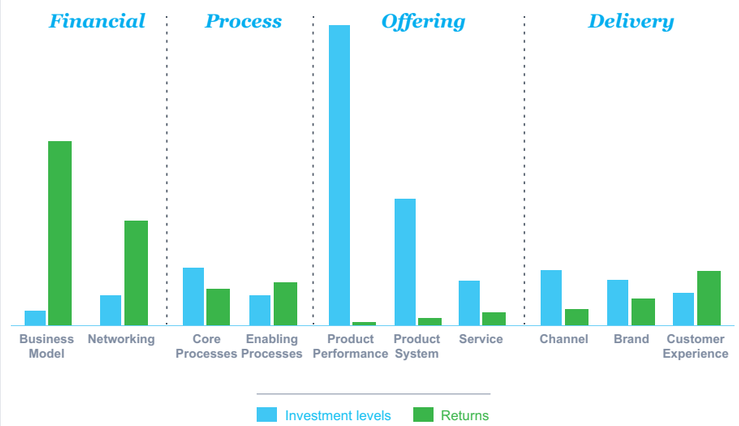
(ADAPTED FROM KEELEY ET AL 2013)

Top innovator performance



(SOURCE: KEELEY ET AL 2013)

Investment levels and returns over the last 10 years



(ADAPTED FROM KEELEY 2004)

A Role for Design as Management Capability

In order to achieve global competitiveness, manufacturing firms need to incorporate designing for creation (making things) with designing for value capture (business model design). A greater level of business sophistication is required to make this happen.

When organisations design for creation their innovation is typically limited to technology. Organisations operating in this mode understand their customers' needs and their current market, have good operational efficiency and are locally competitive. However, by concentrating on improving the product (the 'what'), organisations are naturally focused on what they know, rather than what they do not yet know. Paradoxically, this focus on the 'known' is inherently retrospective; it is the opposite of innovative. When innovation is limited to product design and improvements to technology, organisations leave themselves open to a greater risk of obsolescence – of their competitors speedily developing a better, more cost-effective product.

By contrast, when organisations design for value capture, design becomes an integrated part of the business strategy. In this approach, businesses move away from the product (the 'what') and focus on the purpose (the 'why'). Innovation can be applied to all areas of the business, internally and also within the value chain. The design for value capture approach requires an integrated system of understanding customers and R&D, as well as delivery and services. This approach is led by iterative prototyping in all aspects of the business model, ensuring fast results and continued relevance in the market. Examples of the differences between creating and capturing value are shown in the table opposite from Roos 2011. These two modes of innovating are by no means mutually exclusive; indeed, in many instances, creating value is the necessary forerunner to capturing value. As observed by Roos, Australian manufacturers are strong in innovating to create value, but weak in capturing value. A potential challenge to manufacturing firms making this adoption lies in the level of management capability.

Australia manufacturing scorecard

Type of innovation	Ability of Australian manufacturers	Value outcomes	Available Strategies
Technology e.g. nanotechnology, social media, biotechnology	**Strong**	Innovations that **CREATE VALUE**	**Technology based R&D**
Efficiency e.g. operational, engineering, financial systems, lean manufacturing	**Strong**		**Efficiency based business transformation frameworks**
Offering Design e.g. user-centred, behaviour-changing, marketing	**Weak**		**Design led innovation**
Business Model e.g. stakeholders, distribution, partnerships, revenue models, branding	**Weak**	Innovations that **CAPTURE VALUE**	
Effectiveness Improving e.g. sell the right thing to the right person by providing tailored and customer-focussed solutions	**Weak**		

(ADAPTED FROM ROOS 2011 - MANUFACTURING INTO THE FUTURE)

The People Management Gap

Many Australian enterprises are stronger in operations management than people management (Green et al 2009). While they are able to link employee performance with clearly defined accountability and rewards, they lag in their deployment of advanced people management practices. These include attracting, developing and retaining talent, and identifying innovative but practical ways of developing human capital to improve performance and add value to organisations. A focus on people and culture within organisations will also enable organisations to adopt a culture of risk and flexibility which is based on trust and good leadership and management practice. Compared with international best practice, Australia tends to fail to 'instil a talent mindset', this is essentially a proxy for innovation and design capability. To improve, Australian managers must give more attention to building their people management skills and the relationships within their organisations. There needs to be more management education and a focus on creativity and integrated thinking to enhance the performance of manufacturing firms. A learning by doing approach is also recommended as being key to ensuring that new skills are embedded.

'A key finding of our research is that focussing on the critical mass of poorly managed manufacturing firms within the country is the most effective way of enhancing Australia's overall management capability and performance.' (Green et al 2009)

Seeding and improving the productivity of manufacturing through initiatives and investments in management skills is worth greater attention. A high level of management quality and expertise enables firms and organisations both to develop internal dynamic capabilities and sustainable competencies (Green et al 2009). Building design led innovation skills throughout business has the potential to address this management capability gap.

Design as Business innovation capability

Design led innovation refers to the application of design based practices as a business innovation process. Originating from the practices of the design professions, this branch of practice has been increasingly explicated, appropriated and applied to business management, as businesses have realised the need to expand beyond analytical approaches to conducting business.

A Role for Design as Management Capability

In a manufacturing context, design led innovation allows manufacturers to develop new opportunities for value creation and capture.

It is important to note that design as an innovation methodology does not prescribe solutions or tools, but rather is a practice rooted process and way of thinking that can bring about innovative results. In this way it is different from design in other contexts such as product design.

The benefits of design as an innovation methodology align harmoniously with Australian manufacturing needs:

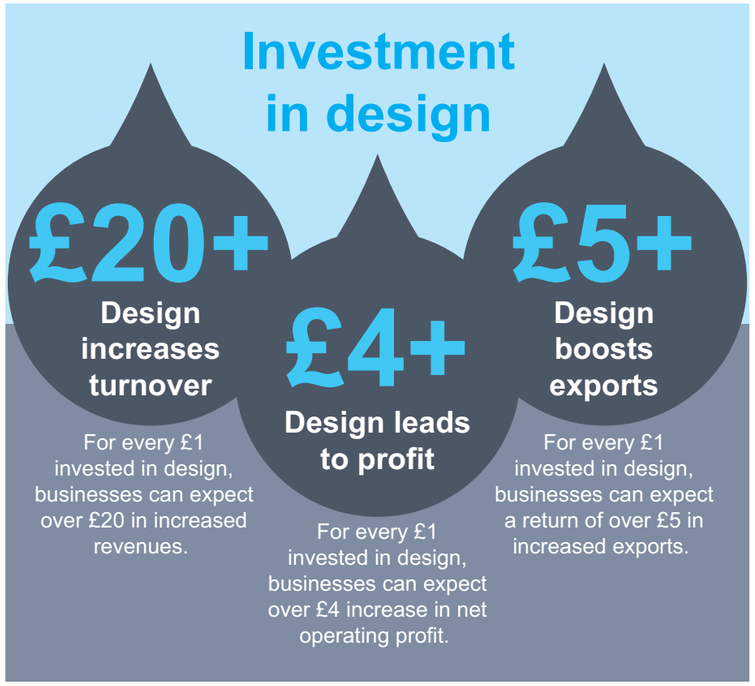
- Holistic visioning shifts emphasis from product R&D solely, towards problem finding and futures exploration.
- Collaborative practice suits limited resources of SMEs.
- A focus on iterative prototyping in business practice allows for affordable and fast results for firms.
- Greater customer effectiveness is achieved through user-centred practice.

There is significant international evidence to indicate the positive contribution of design both to firms and the broader economy. The Design Delivers for Business Report 2012 stated that: (in reference to the following diagram)

- Design increases turnover: For every £1 invested in design, businesses can expect over £20 in increased revenues.
- Design is linked to profit: For every £1 invested in design businesses can expect a return of over £4 increase in net operating profit.
- Design boosts exports: For every £1 invested in design, businesses can expect a return of over £5 in increased exports.

This evidence is further supported by other programs undertaken in several nations. Much of this work focuses on European and Asian nations (Fleetwood, 2005; Marsili and Salter, 2006; Moultrie and Livesey, 2009; Nussbaum, 2006; Raulik, Cawood and Larsen, 2008; Ward and Runcie, 2009). Specific reported programs and examples are highlighted below:

- Between 2002 and 2005, the Finnish government invested 30 million Euros in design research and development in Finland.
- Other countries such as Spain and the Netherlands are expanding their design policy focus to gain competitive advantages.



- Design capability is being nurtured and developed to create competitive advantages across industries in the Asia-Pacific regions, where countries that historically based their economies on mass production now recognise design as key to product and service differentiation (Japan, Taiwan, South Korea, and China in particular).
- New Zealand has achieved proven economic benefit from programs in “Better by Design“.
- The Design Singapore Council is focused on Singapore becoming a hub for design, and Singapore introduced a 250% Productivity and Innovation Credit (PIC) for Investments in Design in its 2010 budget.

Further, the following table developed by the Design Policy Monitor 2012 sets out the complex set of design measures applied across Europe – demonstrating widespread, yet uneven adoption of design support by Governments across the European union (EU). Overall though, while this high level of support is evidence of commitment to design led innovation in some countries, the EU continues to look for more member countries to adopt design led innovation measures as a means of increasing their economic competitiveness.

Design support by Governments across the EU

Country Code	Design Support	Design Promotion	Design Centre	Design Policy
Austria	●	●	●	
Belgium	●	●	●	●
Bulgaria		●		
Cyprus				
Czech Republic	●	●		●
Germany	●	●	●	
Denmark	●	●	●	●
Estonia	●	●	●	●
Greece	●	●		
Spain		●	●	
Finland	●	●	●	●
France	●	●	●	●
Hungary		●	●	
Ireland		●		●
Italy		●		●
Lithuania		●		
Luxembourg		●	●	
Latvia		●	●	●
Malta		●		
Netherlands		●	●	
Poland	●	●	●	●
Portugal		●		●
Romania		●		●
Sweden	●	●	●	●
Slovenia		●		●
Slovakia		●		
United Kingdom	●	●	●	●
TOTAL	12	26	15	15

(SOURCE: WHICHER ET. AL. 2012)

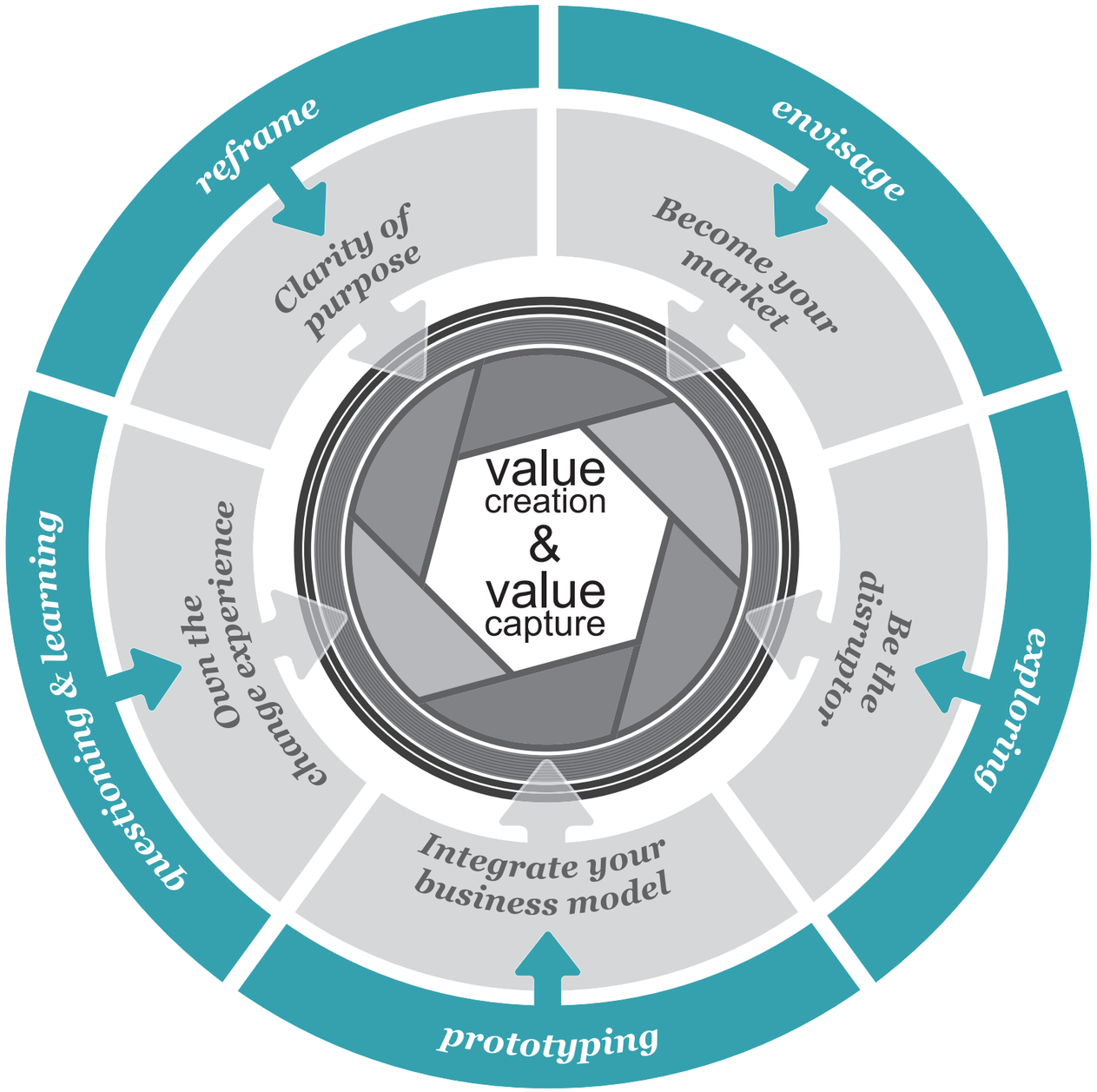
2) Defining the Design Led Innovation Framework

This section outlines a design led innovation framework that reflects the innovation practices held in common by industry innovators. This framework encapsulates five core practicing innovation principles that interviewed firms highlighted as significant in their journey toward global competitiveness:

- Clarity of Purpose
- Become Your Market
- Be the Disruptor
- Integrated Business Model
- Own the Change Experience

Underpinning the practice of these principles is the application of design – a design lens through which the value of design led innovation becomes apparent. The section ends with a case study on Cochlear illustrating how this organisation embraced design led innovation in their journey towards global competitiveness.

Introduction to the Framework



Supporting framework diagram

- framework

- application of design

Our investigations have led to the compilation of a design led innovation framework that reflects the innovation practices held in common by industry innovators.

This framework encapsulates five core innovation principles the interviewed firms highlighted as being significant in their journey toward global competitiveness. These are detailed in the pages following:

1. **Clarity of Purpose**
2. **Become Your Market**
3. **Be the Disruptor**
4. **Integrate Your Business Model**
5. **Own the Change Experience**

Underpinning the practice of these principles is the application of design – a design lens - shown as the outer ring in the supporting framework diagram. This design lens comprises common practices utilised within design:

- Reframe your purpose – challenging what is accepted and creating new ways of looking at the situation
- Envisage – creating visions of possible futures
- Exploring – taking licence to experiment and explore possibilities
- Prototyping – thinking by doing in fast iterative cycles
- Questioning and learning – curiosity accompanied by reflectiveness

Neither the innovation principles nor design practices are novel or significant in themselves. It is only when they are integrated together in a manufacturing context that firms are able to strategically maximise their opportunities to create and capture value and thus remain competitive. Often the shift required by firms in mentality, culture and practice to achieve this is subtle but the difference in outcomes is significant. The principles contained within the framework need to be adopted together, however they may be applied in varying degrees according to what is suitable for an individual firm's circumstances. In practice this process is not static, it is iterative and dynamic.

All of the 14 organisations interviewed as part of this report demonstrate excellence in their field and exhibit a level of business sophistication superior to that of their competitors, although all are at different stages in the journey to becoming globally competitive. In each instance it was found that business sophistication emanates from a design led approach – a focus on value capture (business model design) as well as value creation (making things) – which is the key to their respective competitive advantage.

The guiding principles contained in each of these themes were validated by the experience of some or all of the participating companies. The themes were further refined over the course of the six workshops, upon receipt of feedback from industry. To this end, the themes that follow provide critical insight into how manufacturers can innovate through design to become more competitive.

Clarity of Purpose

know when to say no

Clarity of purpose is the lighthouse that guides all organisation planning and execution. Achieving clarity of purpose requires, in essence, a reframing of business vision and values. It is long term oriented and sits at a high level in relation to business strategy.

Clarity of purpose is best achieved through a culture of questioning and open discussion of organisation purpose, vision and direction. All staff must be encouraged to challenge the organisation's avowed purpose, as part of an ongoing practice of validation and reframing. Many of the organisations participating in the study identified the importance of cultural alignment with organisational purpose, and the importance of involving all staff in the process of defining and redefining purpose. This whole-of-organisation approach brings innovation to all business functions and levels of responsibility. An organisation that constantly refines and clarifies its purpose is better able to adapt to new developments such as changing markets and the discovery of new customer needs.

Clarity of purpose also provides greater effectiveness in allowing a company to critically judge its progress, and prioritise projects and associated investment of resources. A richer understanding of success enables companies to be more holistic in allowing creativity and managing risk, ensuring that the measurement of risk and uncertainty is well understood by all.

The design led difference:

Questioning your organisation's purpose is a critical first step for any efficient organisation. Organisations that question and create an environment where staff are enabled to be critical of a chosen path can reframe their purpose. This reframed purpose should be linked to a clear understanding of the market. Aligning staff with a vision of the organisation's desired future renews focus and energy on core priorities of the business.

The strategy, the vision, the values of the business are central and take input from the rest of the business. Then it cascades back down throughout the business in terms of making sure everybody understands very clearly what those things are and reinforcing them on a regular basis.

- FUTURIS

Our Vision statement now sets a very clear direction for where we want to be as a business. To support this we went out to every team in the business and workshopped what our core values were. We've then been able to design a program that everyone can be a part of and ultimately we aim to have everyone saying "yes" to the things that will drive us towards the vision.

- ENWARE

You have to distil out what the company purpose is and build the company around it. Because we have great clarity of purpose everybody is working on the same thing….so this business becomes their (staff) business as much as it is my business

- CENTOR

Our purpose is known through the entire team. I oversee everything but I don't have to micro-manage them, they know RØDE, they know where they are and what they're doing. Everybody can identify what RØDE is about and where we are going and they are all rowing in the same direction which is great.

- RØDE

The ability to build deep customer insights with cross functional teams and to use this to question the core of the business, gave everyone a voice and allowed the company to take a whole of company approach to its innovation and how it understood its customers.

- GOURMET GARDEN

The lighthouse by which all company planning and execution occurs.

Create an environment where staff can challenge and question.

Innovation in all business functions and levels of responsibility.

True cultural alignment with organisational goals.

Become Your Market

organisation-wide immersion in the customer's world

It goes without saying that businesses whether they are B2B or B2C need to be customer focussed to survive. Australian manufacturers have a demonstrated history of providing quality products and supporting services to their customers. The competitive edge shown by the industry leaders in this study however highlights the need for immersion in the world of the customer, beyond arms-length market research. Immersion achieved deep customer insights and in turn uncovered new business opportunities.

Immersion in the world of the customer is a process of deepening empathy, and has significant implications for organisational alignment. Where immersion is the goal, responsibility for understanding the customer is no longer solely that of the operational marketing department but is organisation-wide, embedded in the culture and formally supported. Immersion in one's market is also important for organisations to constantly test and build on their value proposition. More importantly, in order to remain relevant, expand into the export market and have a presence on the ground in their relevant overseas markets, organisations need to look beyond the world of the customer and gain empathy with all stakeholders in the global value chain.

The outcomes of this approach are significant: manufacturers are able to clarify their organisational purpose by identifying exactly who their customer is, what they value, and why. From understanding the customer's motivations (the why) you may then explore value-laden business offerings (the what), corresponding business models (the how) and strategic partnerships (the who). This rich relationship with customers and stakeholders builds competitive resilience, as it is harder to replicate compared to technological gains. Key competitive insights will also lead to opportunities for market disruption.

The design led difference:

Immersion and deep empathy with the customer's world necessitates meaningful engagement with customers as co-innovators – while they are not responsible for innovation, they are heavily invested in the outcomes. The design approach to customer immersion imagines futures that customers cannot imagine for themselves. This goes beyond traditional market research process and begins with listening to your customers and stakeholders to reveal latent needs and opportunities.

We communicate externally - we are driving the market and teaching them. We are constantly going where it's going and learning how we can predict and telling the end user what we are doing. We are not waiting.

- RODE

Beforehand we couldn't even describe who our customer was – to us the customer was a window and door company. Now the customer is the homeowner, it is very specific who she is.

- CENTOR

If we're going to be relevant we have to understand what's happening far beyond our customer because if you're only asking people what they want, you're going to just end up with a fast, awesome cart. You actually have to imagine a future for them.

- MELBOURNE WORKSHOP PARTICIPANT

Once you understand the customer's Why, you can then go back to the How and the What. If you start with the What it is a field of dreams approach and you are reacting to what the market wants rather than looking beyond it and identifying exactly what your customer needs.

- IVR

Getting deeper customer insights allows you to innovate in new areas and opens up opportunities we would never have considered. On top of this constant prototyping is a key part of building a relationship with customers rather than selling to customers

- GOURMET GARDENS

I think at some stage you've got to break from the voice of the customer because at some stage the customers knowledge is bounded by what they are used to, to some extent.

- SEBEL

Achieve deeper customer insights and realise new opportunities.

Build empathy with all stakeholders.

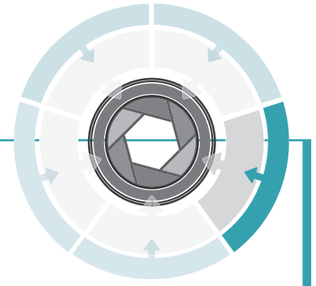
Communicate directly with your customer.

Adapt to new ways of reaching customers through current trends.

Use personas.

Be the Disruptor

change the ground rules



The scale and pace of the global market is such that competitive advantage through technological innovation is increasingly hard-won and short-lived. To be globally competitive the companies observed in this study created business models that envisage not only new products but also markets and services. This is a psychological shift from prediction via a rear view mirror, towards looking beyond the current market and envisaging new values and opportunities; organisations react not to what customers say they want, but are brave enough to consider entirely new directions.

The participating firms highlighted the significance of the pivotal moment of realisation in which their relevance as a business was called into question. This realisation - this 'jolt' when "one day my world changed" – created the opportunity for radically new directions to be explored. Realising the worth of this catalyst, several firms have chosen to deliberately trigger these reflections periodically, testing the validity of their business model by challenging the status quo.

This kind of productive scepticism needs to be supported by organisational leadership that is open-minded and tolerant of failure. The ability to persevere toward ambitious goals through uncertainty and discomfort allows firms to remain globally competitive. Business creativity by definition challenges present-day assumptions; accordingly manufacturers need to accept failure and change as learning opportunities.

The design led difference:

The combination of designing an organisational purpose and identifying deep customer insights places firms in the position to envisage entirely new opportunities or disruptions, rather than reacting to old market opportunities. Disruption is utilised as a productive trigger of competitive behaviour by facilitating reflection and reframing. Creating a level of freedom within a business to explore new directions fosters a healthier view and approach toward risk and change.

"It's part of the work we have done so far to integrate what we think the future looks like so we can actually take that next step later when we are ready

- SEBEL

Its about measuring yourself against what the potential is, lifting your eyes above the horizon even if we fall short and only get half way there we will be challenging ourselves to be more competitive

- BRANACH

Demonstrate courage to commit and follow through no matter what the situation. Commit to the finding and achieving ambitious goals – you will learn more from breaking the system than with you driving conservatively within yourself.

- CODAN

An audit of the culture and vision across the entire senior management team allowed us to fundamentally question the products we were developing .We were a technically led innovation organisation and have developed core manufacturing and operational excellence and with this platform we could explore new opportunities and take that risk in order to develop products that [resulted from] real insight.

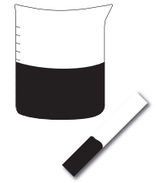
- GOURMET GARDENS

Brace yourself re-jig your brain for a level of open-mindedness that even if you think you are open-minded, you are probably not open minded enough to get it. So brace yourself to be uncomfortable but stick with it and be a believer – you may not get there you know but brace yourself to give it a go.

- RME

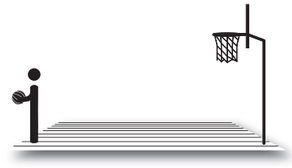
I would say most areas of innovation versus our competition are in business processes and supply chain and we are really clever in setting up business models – to my knowledge we are the only seat company that is inside our customer's factory in the USA – that's really innovative.

- FUTURIS



Regularly test the validity of your business model.

Accept failure as a key opportunity to learn.



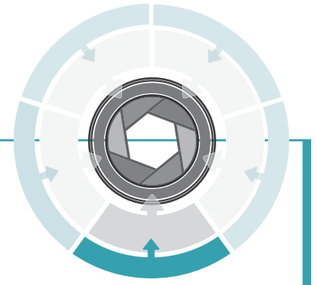
Persevere toward ambitious goals.

Look beyond the current market envisage new values & opportunities.

A "jolt" can expose opportunities to explore radical new directions.

Integrate Your Business Model

design for integration



A working principle behind all companies interviewed was the focus on innovative business models integrated with innovative products as drivers of competitive success. All cited alignment around the company's purpose and the ability to innovate through influence or ownership within the global business value chain as being important. It is within this territory that the biggest gains around value capture may be achieved.

The differentiation from standard business model integration is in the incorporation of design principles into practice. In the same way manufacturers prototype product designs and iteratively refine their design and manufacture, so too should organisations be prepared to transform any aspect of their business model through a process of iterative trials and reflective refinements. There is no one correct business model; alternative models are developed in tandem and trialled in different markets in the act of learning by doing.

Moving away from a product-based view of business toward a more integrative outlook where innovations may come from any part of the business model means that the siloed management of business functions is no longer relevant. Investment in the intangibles such as brand, customer engagement, leadership and staff development are crucial. Applying design to your business model in this way encourages the application of design within a wider context throughout your organisational structures and processes. This is all supported by good leadership, focused attention to detail in execution and the ability to veto activities if they are not creating value for the organisation.

The design led difference:

Broadening the focus beyond the immediate situation (in this case from innovating at the product to the business model level) is an integrative practice of design. The business models are informed from identified organisational purpose, insights gained from disrupting accepted business practice, and integration. The use of the design approach in experimenting and adapting its business model enables a business to become agile, prioritise investment and uncover new opportunities.

You don't innovate without design…so we design the way we go into business… we design the way we engage in business. Like all things you modify your designs as you go along. So we try things, if it doesn't work, we tweak it, we'll develop it

- FUTURIS

It's the idea of actually having plans and strategies, design of so many different areas as part of an overall strategy rather than thinking that design is just something – a design of a product

– IVR Group

I am seeing design in a much broader context, in a technology company where the physical design of a reliable widget is mission critical, but it is only a part of a much much bigger scope to be successful.

- RME

You can't design a breakthrough strategy and a breakthrough business model without going through a journey ….you will take a first step and do that through prototyping

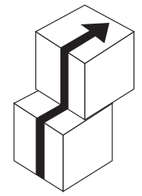
– CENTOR

Well we're thinking more as a logistics business, and actually those same words are being used around our team at the moment because we've gone from being someone that was purely manufacturing to actually having to have significant skills in logistics

– SEBEL

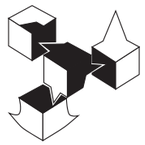
I think the challenge for us is to get our structures right so that we can fully exploit the opportunities that design integration brings – being able to afford to create the right environment to enable innovation to come to the surface…so for example we are making a new women's motorcycle boot and we understood the market was looking for a change so we made it, got people to try it on, got their feedback and changed it as a result.

- ROSSI



Focus on innovative business models, not products.

Investment in intangible areas (e.g. branding) is crucial.



Be prepared to transform any aspect of your business model.

Apply a design lens to your business model.

Own the Change Experience

continuous renewal is the new status quo

Australian manufacturing organisations need to become habitually dynamic to remain globally competitive. Evolution and renewal of a manufacturing organisation ensures its continuing relevance in the market and should be undertaken as a matter of course. Organisational renewal can manifest in, or arise out of new ways of operating, new organisational capabilities and measures of success or failure, and organisations need to be agile and flexible enough to manage such changes.

Of course, day-to-day operations cannot stop while business models, products and processes are being redesigned; thus any change should be piloted alongside and incorporated into business as usual. This approach is particularly important in light of the concern by many manufacturers that they are too busy surviving to invest additional effort and resources in trying new things. Indeed, for most organisations, consciously departing from a hard-won 'sweet spot' for the sake of innovation – when there is never a guarantee of success – seems counter intuitive. To master the art of organisational evolution, therefore, businesses need to persevere and develop the dynamic capabilities needed.

The design led difference:

This type of organisational learning can only be achieved through putting into practice (known as thinking by doing or prototyping within design). It results in an ingrained tailored approach and set of organisational values to innovation that cannot be easily transferred or copied. The process may appears ambiguous at first, but through an experiential learning model, design led innovation becomes more than an innovation program and becomes part of the DNA of the organisation.

We design the way we engage in business. Like all things, you modify your design as you go along. So we'll try something, if it doesn't work, we tweak it, we'll develop it. But we've [also] got some core principles of the way we would design a business or enter new business.

- FUTURIS

[Our learning has been] it's about people and how the company relates to people and vice-versa..that was kind of a big step change and I'm calling the last five years phase one of what we are doing.

- BRANACH

The more you go through the process you realise who you are, where we stand, what needs to be changed and the realistic, pragmatic side of you starts to go, okay, this is where we're going and we are achieving things – change is being made. It's slow and gradual but it's definitely there.

- IVR GROUP

What I like about the design integration approach to some extent is the journey and I think that we're going to have a much better chance of changing things over time because it's going to [progress] slowly, people, they're going to get it.

- ROSSI BOOTS

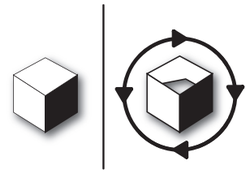
I think that a culture of not just continuous improvement but continuous learning is vital. There is a need to replan, undertake self-assessments, adjust strategy and generally change the way we do things on the factory floor. If you stop doing that you're going to stagnate and eventually lose your competitive edge.

- ENWARE

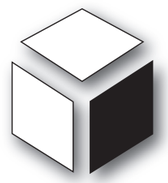
it's going to start with people and culture. So forget what it is that the products or technologies or the markets are that we serve, we have a culture in this organisation that is about people feeling comfortable to respectfully challenge each other every day, okay, and we make it safe for people to do that.

- CODAN

Evolution is needed to ensure relevance in the future of manufacturing.



Any change should be piloted alongside business as usual.



Organisations need to be agile and flexible.

New ways of measuring success or failure should be a matter of course.

Applying the Framework: Cochlear Case Study

We appreciate that design led innovation is a complex concept, that in itself appears simple in nature and not that different to how firms undertake innovation today. The concept is best understood through practice. To assist in articulating the concept, the Cochlear story is one illustration on how the use of design led innovation can create pivotal change and significant positive outcomes for business.

This case study focusses on the period between the late 1980's and 1998 when Cochlear (then still a SME) shifted from manufacturing bodyworn ear devices to the first ever behind the ear device (BTE). Interviews with Cochlear staff from this period reveal that behind this change in product offering lay a more dramatic transformation from a technologically innovative business to a customer focused market disruptor. This foresight toward the emerging needs of hearing aid users and unwaivering commitment to servicing this gap transformed the lives of many patients and ensured Cochlear's global competitiveness. Cochlear was named Australia's most innovative company in 2002 and 2003 and one of the world's most innovative companies by Forbes in 2011. Today, the company holds over two-thirds of the worldwide hearing implant market, with more than 250,000 people receiving one of Cochlear's implants since 1982.

We apply the framework we have developed to illustrate Cochlear's shift from traditional technology led innovation (designing for value creation) toward a design led innovation approach which integrates design for value capture. The intention is to highlight the differences between how design may have been used if the firms had continued to focus on value creation compared with its adopted strategy to focus on value capture - what we define as design led innovation.

Clarity of Purpose

know when to say no

Organisations need to have a clear purpose communicated openly internally and externally to ensure cultural alignment.

How Cochlear used design to capture value

This pivotal moment created the opportunity for a new direction to be explored and the company purpose to be reframed. The key then is to conceptualise this alignment of purpose with business activities as a design exercise which may result in multiple configurations. Cochlear communicated to all staff a clear vision of the company's future and in addition communicated this new purpose to other stakeholders, surgeons and audiologists placing the responsibility for innovation on everyone.

Cochlear's shift towards value capture

Cochlear had communicated their purpose of 'giving access to hearing' to all staff. However, once this had been achieved their purpose needed to shift from one of creating value to capturing value. The company changed their value proposition to focus on recipients and their families – the life changing aspect of the BTE particularly for children and adolescents.

"When you have a range of products that all do the same thing – give you access to hearing – the decisive criteria is not the product itself but why – and the why is the ability of the product to transform the lives of children and adolescents"

Become Your Market

organisation-wide immersion in the customer's world

Organisations need to immerse themselves in the world of their customers and stakeholders to achieve key competitive insights resulting in opportunities for market disruption.

How Cochlear used design to capture value

Cochlear knew that they had to do more than just conventional marketing to envisage entirely new futures. These insights shifted the primary focus for design to be customer led rather than technology driven but they had to also see beyond what the customer could see. While the customer is not responsible for innovation they are heavily invested in the outcomes and this participatory decision making captured value, increasing the relevance of the design. In order to make this shift happen design was not only product focussed but the business model also adapted to ensure serviceability and reliability, which was as important as product performance.

"We have to consider the end customer who has access to a lot of information, a lot of interaction with others and can express their preferences"

Cochlear's shift towards value capture

Organisations need to immerse themselves in the world of their customers and stakeholders to achieve key competitive insights resulting in opportunities for market disruption. Cochlear knew who their customers were - surgeons, audiologists, recipients of the BTE and their families. They built deep insights through building empathy across all stakeholders particularly the recipients and their families by immersing in their world and having Cochlear embedded in clinics to receive constant feedback. They listened to their customer and understood that they were well informed through holding online forums and they learnt what was most important to them.

Applying the Framework: Cochlear Case Study

Be the Disruptor

change the ground rules

Allow yourself to explore and experiment (be creative) with radically new futures of your business around the insights generated.

How Cochlear used design to capture value

They identified new technology trends to augment customer insights and business model opportunities – envisaging a future that their customer could not foresee. Creating a level of freedom within a business to explore new directions is a productive trigger enabling reflection and reframing and ultimately a healthy approach to risk and change. Cochlears' leadership allowed a focus not only on the tactical business (operations / process) but also on radically new directions which could be explored and learnt from rather than immediately discounted when they appeared problematic.

Cochlear's shift towards value capture

Organisations need to explore and experiment (be creative) with radically new futures of the business around the insights generated. Cochlear moved from reacting to the market and concentrating on technology and performance to challenging the status quo focussing on the recipients and their families rather than the surgeons and in so doing created business model futures which envisaged not only products, but also markets and services.

Integrate Your Business Model

design for vertical integration

Organisations that innovate through integration along the value chain will be globally competitive.

How Cochlear used design to capture value

Cochlear was able to drive the change through thinking beyond the product (not as simple as removing wires) and envisaging a new technology platform. They were capabilities driven and focussed their activities where they could design for value and differentiate the product offering from other competitors in the same market. The business models were informed by the reframed organisational purpose and the insights gained from disrupting the normal business practice and vertical integration. The business model was paramount but market leadership also critical. They explored manufacturing options which aligned to their purpose – maintaining a global perspective not just based on cost. They were also mindful of their competitors in this space and by concentrating on the process and speed to market they ensured their success. The focus was on competitiveness and problem solving with the customer in mind to ensure the best device appeal aesthetically.

"As soon as market penetration started who the customer was changed...they were no longer the surgeon or the audiologist but the recipient and their families and it was about cosmetic appeal rather than performance"

Cochlear's shift towards value capture

Organisations that innovate through integration along the value chain will be globally competitive. Cochlear shifted from focussing on ideas and design solutions based around known user needs and specifications to broadening the focus beyond the immediate situation. The final outcome was not just a new product but an integrated business model – a technology platform and service model with new internal capabilities.

Own the Change Experience

renewal is the new status quo

Organisations need to be dynamic, agile and flexible and embrace change in order to remain relevant in the face of fierce global competition.

How Cochlear used design to capture value

They did this by prototyping by design not just of the product but of their business model and this resulted in a set of organisational values to innovation that cannot easily be transferred or copied. Cochlear applied the same process and recognition they gave to technology led innovation to intangible innovation activities like serviceability, reliability, and customer satisfaction.

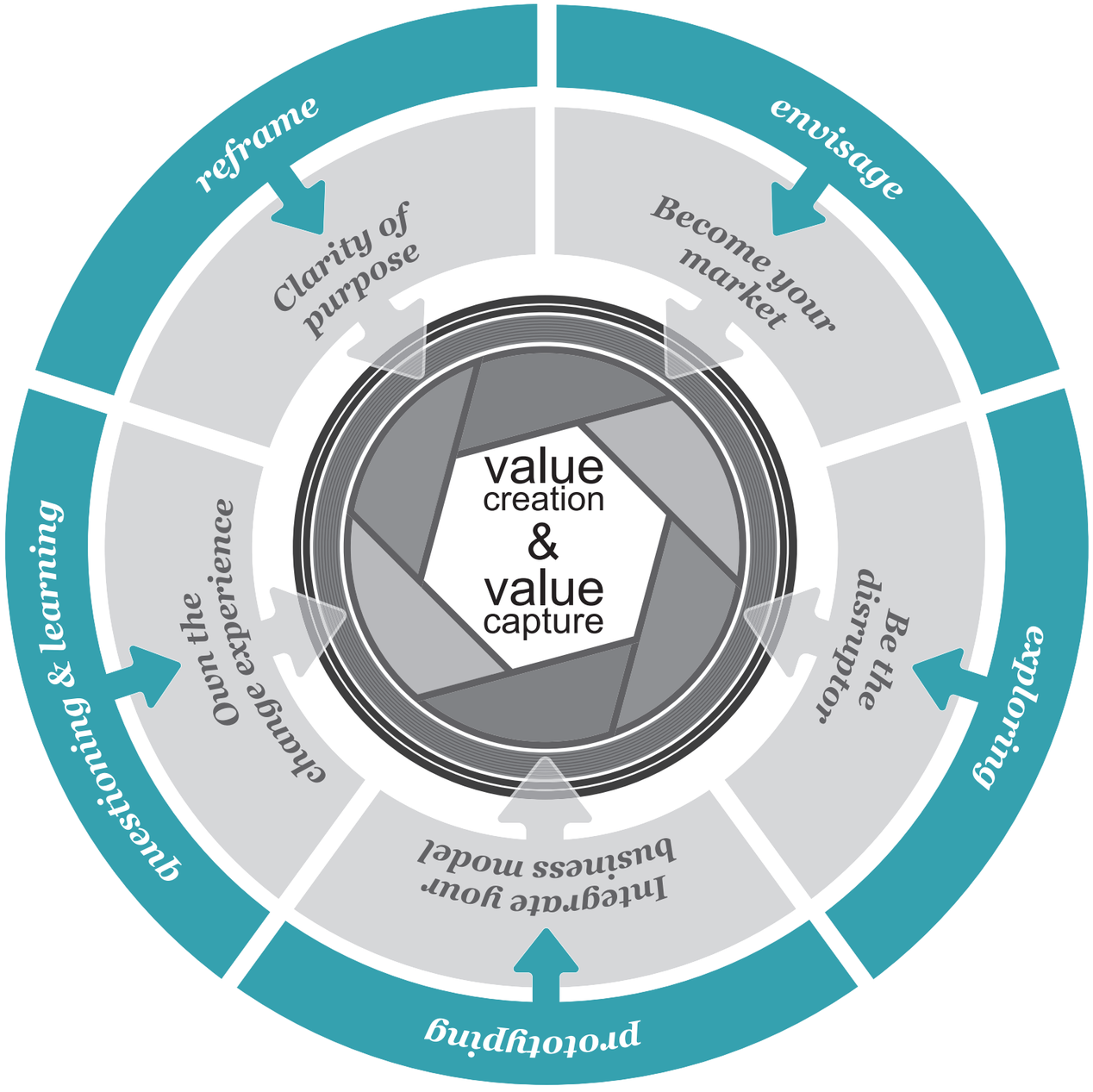
This design led innovation became more than an innovation program and more synonymous with the DNA of the organisation and today Cochlear continues to innovate with their customers and stakeholders in each of their regions.

'Marketing has to change - the impact of big exhibitions is minimal because you are preaching to the converted...you need to reach beyond the customer you already know and use the communications forums available now to touch your real customers"

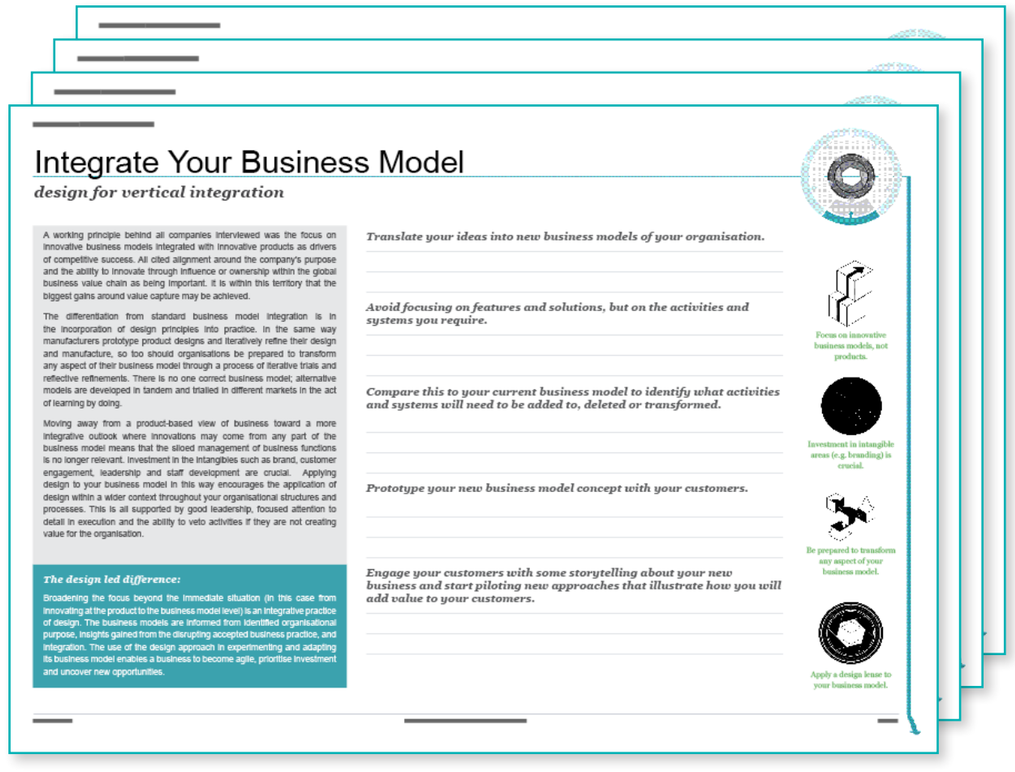
Cochlear's shift towards value capture

Organisations need to be dynamic, agile and flexible and embrace change in order to remain relevant in the face of fierce global competition. Cochlear changed from investing in incremental technology enhancements or new technologies to investing in customer engagement, re-designing the business model and enhancing leadership capability.

Quick Reference Guide: Introduction



A Quick Reference Guide is laid out in Appendix 2. This is a practical application of the design led innovation framework illustrated in the body of this report. In this guide a series of questions and tools encourages firms to establish where their organisation is today and highlights what gaps they may need to address. It encourages organisations to view themselves through a design lens to reveal new innovation opportunities. This process is not exhaustive but will raise awareness of design led innovation and how it can be applied to an individual organisation.



Integrate Your Business Model

design for vertical integration

A working principle behind all companies interviewed was the focus on innovative business models integrated with innovative products as drivers of competitive success. All cited alignment around the company's purpose and the ability to innovate through influence or ownership within the global business value chain as being important. It is within this territory that the biggest gains around value capture may be achieved.

The differentiation from standard business model integration is in the incorporation of design principles into practice. In the same way manufacturers prototype product designs and iteratively refine their design and manufacture, so too should organisations be prepared to transform any aspect of their business model through a process of iterative trials and reflective refinements. There is no one correct business model; alternative models are developed in tandem and trialled in different markets in the act of learning by doing.

Moving away from a product-based view of business toward a more integrative outlook where innovations may come from any part of the business model means that the siloed management of business functions is no longer relevant. Investment in the intangibles such as brand, customer engagement, leadership and staff development are crucial. Applying design to your business model in this way encourages the application of design within a wider context throughout your organisational structures and processes. This is all supported by good leadership, focused attention to detail in execution and the ability to veto activities if they are not creating value for the organisation.

The design led difference:

Broadening the focus beyond the immediate situation (in this case from innovating at the product to the business model level) is an integrative practice of design. The business models are informed from identified organisational purpose, insights gained from the disrupting accepted business practice, and integration. The use of the design approach in experimenting and adapting its business model enables a business to become agile, prioritise investment and uncover new opportunities.

Translate your ideas into new business models of your organisation.

Avoid focusing on features and solutions, but on the activities and systems you require.

Compare this to your current business model to identify what activities and systems will need to be added to, deleted or transformed.

Prototype your new business model concept with your customers.

Engage your customers with some storytelling about your new business and start piloting new approaches that illustrate how you will add value to your customers.

Focus on innovative business models, not products.

Investment in intangible areas (e.g. branding) is crucial.

Be prepared to transform any aspect of your business model.

Apply a design lense to your business model.

QUICK REFERENCE GUIDE EXAMPLE, SEE APPENDIX 2

Supporting framework diagram

- framework

- application of design

3) Conclusions and Next Steps

This report has captured insights and identified opportunities that need to be explored and delivered through a comprehensive design led innovation action plan. This will be a crucial first stage in the development of an approach that can be taken up by Australian industry. If we are to build competitiveness through design led innovation the adoption of this action plan and the scaling up from the organisational level to the national level will be an important step in ensuring the future of Australian manufacturing. Key elements of this design led innovation action plan include:

1. Raising awareness of design led innovation within Australian manufacturing companies and shifting thinking within those companies that have a rudimentary knowledge of design led innovation.
2. Support for Business: Developing and enhancing opportunities to support manufacturing companies looking to utilise design led innovation as a method of increasing their competitiveness.
3. Capturing evidence of design led innovation within Australian manufacturing companies to build a knowledge base from which to grow.
4. Building capability of design led innovation within Australian manufacturing companies.

Summary of findings

This process identified key characteristics of successful companies that can be integrated into a company's operations and culture to increase their competitiveness, and provided a wealth of additional insights that led us to envision a new future where:

1. ...Organisations can capture significant value through adopting design led innovation.

The companies interviewed for this report brought design led innovation to life in their organisations and have achieved some noteworthy success. In contrast, we identified through undertaking this project that by and large, companies do not use design to capture value. There is also an accompanying lack of awareness and misunderstanding of the role of design in building competitiveness. In addition there is only a limited platform for champions to be heard i.e. there is no community of practice to support the sharing of learnings or to build competency.

It is necessary to raise awareness of design led innovation amongst Australian SME's and work towards shifting the thinking of those companies that are unaware of the value that adoption of design led innovation can afford.

2. ...Ongoing activities to support design led innovation in business can improve the opportunities for success.

Capability building is therefore essential. We have identified that there are no comprehensive or ongoing, broad based programs in place in Australia to support design led innovation. To date programs have primarily been pilots with no continuity assured. To achieve greater success any future schemes need to be coordinated and scaled up to a national level. There is presently no eco-system across the innovation system to support the building and/or integration of disparate knowledge.

Action needs to be taken to scale the level of support for SME's in the adoption of design led innovation in an integrated way across the national innovation system.

3. ...A solid research base is developed from which to take action.

There has been limited practical, industry focussed research on design led innovation in Australia. This research needs to be multi-disciplinary, action led and methodologically sound to capture evidence and inform other research practice. Understanding how to improve business competitiveness will be important as we move forward. Accordingly Australia will need to boost industry relevant research undertaken into design led innovation to underpin industry competitiveness.

Development of an industry focussed and action led research base is essential to identify and target avenues for action and so build industry competitiveness.

4. ...Skills and capabilities underpin a path to the adoption of design led innovation.

Building the capacity and capabilities across the innovation system and providing opportunities for lifelong learning in design led innovation will create a culture that can more readily take advantage of opportunities for growth including enhancing the impact of technology based innovation.

It will therefore be necessary to develop a broad based capability and capacity building approach in the education system, in industry support programs, in industry, in universities, within research organisations and across the public sector to reap the rewards of design led innovation.

Next steps

A key component of the adoption plan is the provision of underlying support to enable and enhance wide adoption of design led innovation at the individual business level. Possible ways forward are suggested in the table below. These suggestions are comprehensive in scope, spanning education and training, research, and policy to ensure sustained outcomes. They are also not intended to be prescriptive but are designed to stimulate activity.

Shift Thinking and Raise Awareness

Raising awareness in the Business Community through:

- Develop the voices of Champions – through case studies.
- Conduct a CEO Forum.
- Hold an International Conference/s here in Australia.
- Build awareness of design led innovation in the broader community.
- Bring together the disparate elements of design under a cohesive umbrella.
- Coordinate a comprehensive research effort focused on building business competitiveness outcomes.

Developing an Infrastructure to represent the views of key stakeholders:

- A key component in supporting the introduction of a design led innovation framework into Australian culture is the need to support the running of key advisory/ intermediary bodies that promote and develop a cohesive platform for design led innovation.

Support for Business

Support for Business:

- Build a knowledge base of high performing/potentially high performing, innovative firms that would be eligible for support.
- Form clusters of activity to build critical mass and centres of excellence.

Coordination:

- Build capacity through an integrated and comprehensive design led innovation based policy agenda to be developed that promotes business competitiveness through:
  - Innovation
  - Trade
  - Education
  - Small business

Coordinate efforts at State and Federal levels

- Build capacity through collaboration and coordinating efforts in the delivery of design led innovation programs across Australia to ensure consistency, share knowledge and build national competitiveness possibly through the Council of Australian Governments (COAG) or other relevant coordinating mechanisms.

Capture Evidence

Research:

- A comprehensive program of research would help to underpin a more robust understanding of design led innovation and its application in business, as little research is currently undertaken in Australia. Multidisciplinary and action based research drawing on evidence from science, business and design practice may be the most appropriate means of capturing this evidence. A solid research base would also enhance knowledge within the academic professions.
- In the longer term, a design futures body of work, where the future of Australian manufacturing can be fully explored through a design lens, may be appropriate.

Build Capability (Learn by Doing)

Education/Skills:

- Building capacity from the foundations up and embracing lifelong learning principles, incorporating the following elements in a nationally coordinated way:
  - Education in design led innovation from K-12
  - Building design thinking into all graduate and post-graduate higher and vocational technical education courses.
  - Encourage the development of specific design thinking courses in their own right – at both tertiary and TAFE levels.
- Acknowledging that this is not a short term fix but a fundamental change over the longer term - develop a tiered approach to education for business, incorporating elements such as:
  - Business Audit
  - Design Integration courses
  - Mentoring/coaching
  - Leadership programs for current industry leaders.

Capacity Building to deliver Design Integration programs:

- There is currently a modicum of expertise in delivering design integration programs to business. If design led innovation is to become commonplace within industry, increased expertise across the country would be required.
- Utilise a strong independent and interconnected network of those implementing design led innovation – to ensure sharing of knowledge and multi-disciplinarity in solving problems.

Public Sector:

- As evidenced primarily in Europe and through agencies such as the Australian Taxation Office, taking a design led approach to the delivery of services by Government has led to increased efficiencies and productivity gains. Such an approach may warrant further exploration here in Australia.
- Utilise design led innovation in the transformation of knowledge generated through the Publicly Funded Research Agencies (PFRAs) and universities to improve the impact of government investment.

Conclusion

This study represents a major step forward in seeking to grow Australian competitiveness through design led innovation. Through working with industry and capturing their collective voices we have been able to provide some important lead examples of how to change.

What is needed now is to scale this knowledge and the evidence captured from the sample organisations across the manufacturing landscape. This requires an integrated approach from government, industry and the research sector to incorporate design led innovation throughout the sector and ensure Australia's manufacturing competitiveness.

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Codan
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Managing Director and Chief Executive Officer

Enware Australia
Adam Degnan
Managing Director

Futuris Automotive Interiors
Dexter Clarke
Chief Financial Officer
Mark De Wit
Managing Director

Gourmet Garden
Nick White
Chief Executive Officer

Haigh's Chocolates
Alister Haigh
Chief Executive Officer

IVR Group
Stephen Bird
Managing Director

Rossi Boots
Neville Hayward
Chief Executive Officer

RØDE Microphones
Peter Freedman
Owner and President

Russell Mineral Equipment
John Russell
Owner and Chief Executive Officer

Sebel
Greg Welsh
Chief Executive Officer

Superior
John Hogan
Chief Executive Officer

ADIN

Australian Design Integration Network (ADIN) is a voluntary network established by CSIRO and UTS in 2012 to develop and promote the value proposition of design led innovation, and by doing so promote access to world class design integration programs, education, skills development and research opportunities for Australian industry to lift industry competitiveness.

Professor Sam Bucolo is the Convenor of AIDN and Professor of Design and Innovation at the University of Technology, Sydney. Sam has worked as an industrial designer in companies such as Phillips and Nokia and is a leading academic and practitioner in the emerging field of design led innovation. Sam has led several projects which have transformed business through embedding design capability within an organisation.

Mr Peter King is the Secretariat of ADIN and is Manager of Design Integration in CSIRO's Future Manufacturing Flagship. Peter has extensive policy development experience in Industry, Innovation, Science and Resources policy and has worked as a science policy advisor in several Ministers' Offices and for Australia's Chief Scientist.

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APPENDIX 1

- Case studies
- Workshop findings

Case studies

Companies from around the country were generous in sharing their innovation experiences. Their profiles are shown in the pages following.

* BUSINESSES ARE PLACED ON THE MAP IN APPROXIMATE LOCATIONS

Industry Champions Interviews

To illustrate how design can be used for manufacturing competitiveness, we chose organisations that had either undertaken a design innovation program or received a design, innovation or export award. Fourteen (14) organisations across Australia were identified as industry leaders in the SME manufacturing sector. In the selection of firms, we wanted to ensure a breadth of company size (revenue and staff), manufacturing sector type, export focus, longevity and geographical location. Our research sought to understand the secrets behind their successes and how these may be translated into guidelines to help other organisations around Australia become more competitive.

All organisations were interviewed using semi-structured interview techniques focusing on how they had achieved competitiveness through innovation and what challenges they had faced, as well as what measures had led to success. Questions aimed to elicit information about how design had driven innovation within each organisation and how value is created and captured.

Case studies

HAIGH'S CHOCOLATES

Fourth generation, family owned Haigh's Chocolates is Australia's oldest chocolate retailer making fine chocolates from the cocoa bean. The company is vertically integrated, maintaining complete control of the manufacturing process from cocoa bean to block and into its retail stores in Adelaide, Melbourne and Sydney. The past few years have seen concerted business expansion and careful management of the Haigh's experience for consumers.

"While the Haigh's experience is at a certain level now, we need to go beyond that to keep surprising our customers. We must constantly increase the already high bar we set ourselves and the only way we can do that is through change."

- Alister Haigh, Chief Executive Officer

ANCA

ANCA, a market leading manufacturer of CNC tool grinders, was founded in 1974 in Melbourne, Australia, where the company still has its global headquarters. ANCA also has offices in the UK, Italy, Japan, China, Thailand (manufacturing), Brazil, Mexico, India and the USA. The company also has a comprehensive network of representatives and agents worldwide.

As ANCA designs and manufactures its own machines and software, the company is able to provide innovative solutions for components such as CNC controls, spindle and servo drives. ANCA manufactures all its own main mechanical components and assemblies.

'We have a setup of global support network, a lot of [our customers] are global and really, if you are going to be selling to them you've got to be able to offer a global support structure. It's a very expensive business, maintaining the global support structure but really it's almost one of the costs of doing business.'

- Pat Boland, Founder of ANCA and Joint Managing Director

ENWARE

installingconfidence

Enware Australia recently celebrated 75 years as a leading manufacturer and distributor of a wide range of products in the Specialist Plumbing, Adaptable Living, Environmental, Health & Safety, Water Metering and Washroom Systems markets. Enware's point of competition is in comprehensive solutions, high quality standards of production and water and energy efficiency, rather than price as a priority. Enware employs approximately 170 people in Australia, with a further 30 in their Singapore, Dubai and India offices to help export into South-East Asia and the Middle East. Their product range has expanded considerably over the years, but still with a niche focus on laboratory, schools, hospitals and food service product needs.

'What we think we do well is being flexible. Forget what products or technologies we deliver, or even what markets we serve, we have a culture in this organisation that allows people to respectfully challenge and question each other every day. This openness, this right to challenge keeps us competitive, keeps us moving and drives positive change. We recognise our people are the foundation for sustainability in the improvement of an organisation.'

- Adam Degnan, Managing Director

Case studies

Rossi Boots

Rossi Boots is an Australian owned and operated family business specialising in hard-wearing footwear for safety work gear and recreation. Retaining Australian ownership of this family business is a core philosophy: the company is the only major shoe manufacturer in Australia which has kept every aspect of production on Australian soil, with 90 staff employed within its Adelaide facilities. Over the years Rossi have supplied boots to the Australian military and produced quality sports footwear. The company currently produces 250,000 pairs of shoes annually with 50 styles across nine specialist footwear categories.

'I think what we've got to do is understand our consumer's needs, provide them with the products that they need that satisfies problems or issues that they don't even realise they've got. Then the price will be a lot less important.'

- Neville Hayward, Chief Executive Officer

FUTURIS

Futuris is Australia's leading and award winning automotive components manufacturer. Futuris' major customers include GM, Ford, Toyota, Chery, JAC, SAIC, Brilliance and Tesla.

From a design and engineering base in Australia, Futuris Automotive produces seating and interior trim products through a growing international network of design, manufacturing and logistics facilities all located close to strategic customers in the emerging markets of China, Thailand as well as into North America, with further growth underway in both the Asia Pacific and Americas regions.

Flexibility and agility are cited as being core strengths of the company. Market share is protected through strong partnerships, innovative business models, proven quality, competitive costs and high barriers to entry.

'Little old us, we sort of fit into the mix of these global seating platforms and what makes us unique there is actually our size. We use it to our advantage and generally are a bit quicker, more nimble, agile and flexible. We'll send our top guys to really listen to what the customer is asking for and make sure we give them offerings that really suit what they're asking for.'

- Mark De Wit & Dexter Clarke

GOURMET GARDEN

Australian owned and operated herb and spice producer, the Sunshine Coast's Gourmet Garden, produces high-quality herbs and spices packaged in an easy-squeeze tube. The company has become a competitive global player, exporting to US, Canada, UK, Europe , NZ and Asia, with products found in the fresh produce section of some 14,000 grocers and supermarkets around the world. The company employs approximately 140 staff, with operations in New Zealand, US, Canada and the UK as well as Australia.

In recent years Gourmet Garden has taken steps to establish an ongoing dialogue with consumers to develop consumer-driven product innovations. The company utilises a combination of online surveys, face-to-face focus groups, and independent surveys to gain new customer insights. Innovations resulting from this customer-driven approach include a small-size version of the specialty herbs range, as well as the rebranding of their 'Fresh Seasonings' range.

"GG has always been good at market research, but [a design led innovation approach] has allowed us to get a deeper insight around our customers which has allowed us to innovate in new areas and opportunities we would have never considered"

- Nick White, Chief Executive Officer

Case studies

RME Mill Relining Systems

Russell Mineral Equipment is the world's leading manufacturer and supplier of specialised equipment and services to a niche hard-rock mining market. RME's innovations in the areas of equipment and services makes the maintenance of grinding mills faster and safer; this reduction in downtime has boosted the productivity of mine operators in more than 50 countries.

"I'm seeing design in a much broader context of which in a technology company, the physical design of a reliable widget is mission critical but it's only a part of a much bigger scope to be successful."

- John Russell, Owner and Chief Executive Officer

SUPERIOR® Work • Play • Life

Superior is a multi disciplined organisation with a mission to provide flotation with sustainable solutions to support work, play and life. The original business has been based on the Gold Coast Australia for over 25 years and provided marinas, pontoons and docking systems internationally in the recreational marine industry. In recent years this expertise has been expanded into the SuperiorWork brand of mining and industrial flotation products. The third sector of the Vision is SuperiorLife which encompasses aquaculture, energy systems and water quality improvement.

With an emphasis on personal service, Superior's comprehensive products offer a satisfying customer experience.

"I'd say that the management team are pretty connected because they have knocked back some of my ideas. I came home from a show with this fantastic product and I went to put it up and I got shot down and they quoted me the mission statement."

- John Hogan, Chief Executive Officer

IVR GROUP

Australian owned and operated, IVR Group was established in 1967 and has since grown into the largest diversified, natural ventilation designer, supplier and installer in Australasia.

IVR Group serves industry, commerce, mining, government infrastructure and the community, providing reliable natural ventilation through innovation, technical expertise and a dedication to tailoring project-specific solutions. IVR Group have developed an extensive service network of experienced and qualified service personnel to provide adept, individualised smoke/heat ventilation servicing and maintenance for industrial, commercial and community buildings.

"We [used to be] reactive - talking to people and someone would say 'can you do this sort of thing" and we were like 'yeah ok' and then we would try and solve it, and we weren't taking that design led process. We were more reacting to what the market wants, and as a result, constantly tinkering to try and get things to fit"

- Stephen Bird, Managing Director

Case studies

Centor is a multi-award-winning designer and manufacturer of folding, sliding, locking and screening systems for windows and doors. The organisation underwent a complete transformation in 2011, embarking on a new and exciting business strategy that saw over 150 R&D projects cancelled in place of one ground-breaking project to create the world's first integrated door.

The design process for Centor's ground-breaking new door has been led by the principles of design-integration, which helped form the company's new central business strategy and core business principle: 'the world is beautiful. We believe in connecting people with the world outside'.

"If instead you start with the why then it's built inside the DNA of the company and everything resonates out from that and it completely and utterly changed the face of this business."

- Nigel Spork, Managing Director

In 1990, Mike and John Walsh, the founders of Branach identified the lack of a quality fibreglass ladder in the market place. With this in mind, they set out to develop a ladder that would be superior both in manufacturing technique and finished product. The brothers, both with a background in engineering, discarded existing concepts about ladder construction to invent a world-class fibreglass ladder unmatched in strength and lightness with anything else on the market. Their research and development led to Branach's patented box-rail ladder construction. Today, Branach continues its focus on innovation and develops new products and accessories to solve workplace challenges faced by their clients.

"It's not easy and like I say, whether we get there or not I don't exactly know but that is part of lifting your eyes above the horizon and not just a foot in front of you, to say well, this is what is possible, can we get there? There's been a few examples of companies that have actually been able to do that and I know it is possible, so I figure if we fall short and only get half way there, well that's not too bad either is it?"

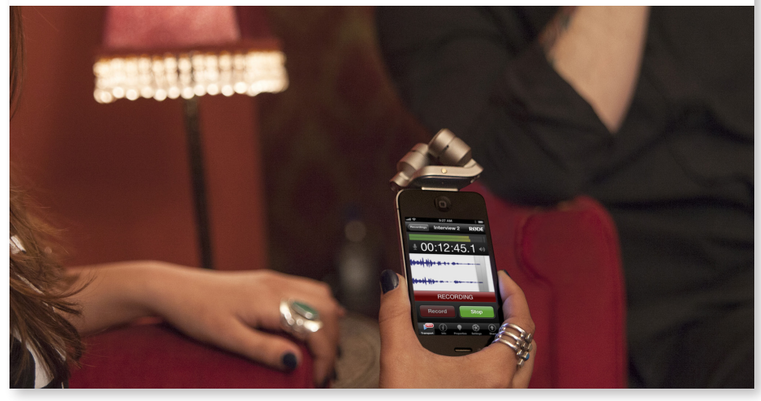
- Mike Walsh, Managing Director

RØDE Microphones designs and manufactures high-quality microphones and related accessories for studio, live and location use. The current NSW Exporter of the Year, RØDE products are designed and primarily manufactured in Sydney, Australia and exported to over 100 countries worldwide.

Initially the company focused on microphones for studio recording but has since branched into location recording, with its innovative VideoMic series becoming the world's best-selling on-camera microphone. In January of this year RØDE announced the first of its products for Apple's iOS platform, the iXY stereo mic and RØDE Rec field recording app, which have been awarded a number of prestigious international product awards, such as Europe's Red Dot and the Australian International Design Award.

"Our purpose is known through the entire team. You know, people stay here, 10 years is nothing, most people are long-termers... I oversee everything but I don't have to micro-manage them, everybody could identify what RØDE was about and where we were going and they are all rowing in the same direction which is great."

- Peter Freedman, Owner and President



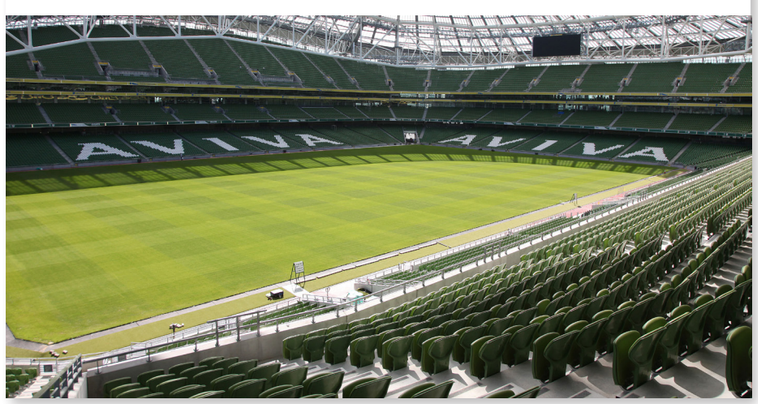
Case studies

Sebel is the only Furniture Company in Australia that operates its own, in-house testing laboratory to ensure the durability of its designs. Sebel has Australia's largest furniture R&D team and full prototype modelling shop with the state-of-the-art 3D support tools.

Balance and critique is important in the design process, so Sebel regularly employ external designers to supplement and balance the company's worldview. As the business must compete with low cost imported products, it is only through innovation in design, manufacture, supply and sales processes that Sebel maintains its position in the market.

'I spend a lot of my time with customers. I spend a lot of my time with the reps on the road in front of them just looking at what's happening. I personally attend the major trade shows and try and understand where designs are heading and why. Because the customer doesn't know what the customer wants, so you've got to find out how to do this.'

- Greg Welsh, Chief Executive Officer



Codan Limited is a group of electronics and engineering businesses that uses its design and manufacturing skills to provide best-in-class electronics solutions for global markets. Codan's core products are high frequency (HF) radios and land mobile radio (LMR) infrastructure, metal detectors and mining technology solutions.

Codan's success has been driven by its ability to optimise the development and manufacture of sophisticated electronics products and associated software; this has enabled them to deliver cost-effective solutions to a range of customers in the communications and metal detection markets. Codan staff foster the unique culture of the organisation, where challenging the status quo and giving and receiving feedback are critical.

"If you can surround yourself with people that are smarter than you, then you are more likely to be successful... the leader that wins, is the leader that can culturally provide an environment for their staff that compels them to give discretionary effort."

- Donald McGurk, Managing Director and Chief Executive Officer

Workshop findings

Highlighting the need to raise awareness of design led innovation as a vehicle to manufacturing competitiveness and support for programs to assist SMEs in their quest to become design led.

Workshops were conducted across the country during the course of this study in Melbourne, Sydney, Brisbane, Hobart, Adelaide and Perth. There were 250 registered attendees, with 135 participants undertaking on-line surveys during the course of the workshops. These sessions relayed initial findings around design led innovative practice to industry, with an emphasis on open discussion and feedback from participants.

The makeup of those attending the workshops was predominantly manufacturers, but also included a number of other key contributors to the broader manufacturing eco-system. The differing viewpoints also made for lively debate amongst participants in the workshops and added a depth of views that would not have happened if the grouping were solely manufacturers.

The subsequent presentation of findings in this document has therefore been carefully considered in response to this received feedback. In addition, a number of challenges to broad based adoption became apparent in the course of these workshops and are discussed below.

Are we there yet? – Businesses are not innovating to the fullest extent

Many workshop participants felt they were already innovating in the same manner and vein as would be the case if design led innovation were to be applied, yet analysis of the workshop discussions and survey results revealed an inconsistent picture when considering attitudes and adopted approaches to innovation. Workshop participants identified their innovation performance as predominantly self- reliant within their own businesses, with an irregular level of engagement across their supply chain and with their customer base. Discussion highlighted the 'responsibility' of innovation resting solely on an individual firm's shoulders. It is apparent companies are missing out on the opportunities to influence innovation within their supply chains and are also down playing the importance of utilising their customers to influence their innovation activities.

In the surveys that were undertaken, alignment to company strategy was rated one of the lowest innovation challenges faced by companies compared with remaining profitable and funding innovation activities, indicating that industry participants generally felt their strategies were in place and well set to drive growth.

It was also clear throughout all discussions across Australia that in general, manufacturers are concerned with the here and now. Consideration of a portfolio approach from short to the longer term did not arise.

'This is just good business practice' – Awareness of the role of design in innovation

The word design and its more common association within manufacturing with product design led to some confusion regarding the scope and role of design applied at a business level. Many participants associated design as a technical activity enacted by those from a formal design discipline background. When discussed in the context of innovation, much of the dialogue centred on product or technology based research and development.

Where the broader application of design in a business model sense was recognised, the discussions would lead to question the difference between design as a business innovation approach from other frameworks such as LEAN and ISO 9001. For instance, how did it differ from an approach toward continuous improvement? As a result the message contained within this document is a concerted effort to address these questions and we also recognise that there is a broader issue within the industry regarding awareness of design that needs to be addressed.

"Designing stuff and design is not the same"

- Sydney participant

"Although each individual element deeply resonates with what we've heard before, the whole point of the design approach means you go about it differently than you normally would with strategic management"

- Brisbane participant

"In going through the design thinking methodology, my experience was that it looked from the outside like it was just another methodology [with its own] set of buzz words; and the actual experience of doing it - it was only through actually doing it that you realised that whilst you sort of innately knew some of the things – forcing it into a process and actually forcing everybody to do it is what became the differentiator. And that's when everyone realised that everybody in the workplace was really part of innovation."

- Adelaide participant

The need for broad based skilling of industry and supported collaboration and using design led innovation to minimise risk.

There was a high level of interest in previous state level design led innovation programmes and support for these programmes to be more accessible for all industry. In particular, the one-on-one mentoring approach appealed to many firms. Businesses highlighted a capability gap within industry that needs to be addressed to sustain long-term benefits of these programs.

Uptake of design led innovation by companies was also seen as a means of minimising the risk of innovative activity within companies as understanding of the customer/market and creating a model of "shared ownership" became more pervasive.

Many participants also observed the need for greater industry collaboration noting the limitation of knowledge and resources at an individual business level. Collaboration was highlighted as a method to share costs, build and exploit clusters, and generate capability through mentoring and education. Thus, lack of national coordination for skilling and supported collaboration remains a barrier to broad industry adoption of design led innovation.

APPENDIX 2

- Quick Reference Guide

Clarity of Purpose

know when to say no

Clarity of purpose is the lighthouse that guides all organisation planning and execution. Achieving clarity of purpose requires, in essence, a reframing of business vision and values. It is long term oriented and sits at a high level in relation to business strategy.

Clarity of purpose is best achieved through a culture of questioning and open discussion of organisation purpose, vision and direction. All staff must be encouraged to challenge the organisation's avowed purpose, as part of an ongoing practice of validation and reframing. Many of the organisations participating in the study identified the importance of cultural alignment with organisational purpose, and the importance of involving all staff in the process of defining and redefining purpose. This whole-of-organisation approach brings innovation to all business functions and levels of responsibility. An organisation that constantly refines and clarifies its purpose is better able to adapt to new developments such as changing markets and the discovery of new customer needs.

Clarity of purpose also provides greater effectiveness in allowing a company to critically judge its progress, and prioritise projects and associated investment of resources. A richer understanding of success enables companies to be more holistic in allowing creativity and managing risk, ensuring that the measurement of risk and uncertainty is well understood by all.

The design led difference:

Questioning your organisation's purpose is a critical first step for any efficient organisation. Organisations that question and create an environment where staff are enabled to be critical of a chosen path can reframe their purpose. This reframed purpose should be linked to a clear understanding of the market. Aligning staff with a vision of the organisation's desired future renews focus and energy on core priorities of the business.

Ask your senior management team what makes your organisation unique?

Ask what business activities refine your point of difference?

Ask what activities you would be willing to give up as they do not relate to your point of difference?

.....With the responses, reframe your vision and mission and the types of activities you should be undertaking

The lighthouse by which all company planning and execution occurs.

Create an environment where staff can challenge and question.

Innovation in all business functions and levels of responsibility.

True cultural alignment with organisational goals.

Become Your Market

organisation-wide immersion in the customer's world

It goes without saying that businesses whether they are B2B or B2C need to be customer focussed to survive. Australian manufacturers have a demonstrated history of providing quality products and supporting services to their customers. The competitive edge shown by the industry leaders in this study however highlights the need for immersion in the world of the customer, beyond arms-length market research. Immersion achieved deep customer insights and in turn uncovered new business opportunities.

Immersion in the world of the customer is a process of deepening empathy, and has significant implications for organisational alignment. Where immersion is the goal, responsibility for understanding the customer is no longer solely that of the operational marketing department but is organisation-wide, embedded in the culture and formally supported. Immersion in one's market is also important for organisations to constantly test and build on their value proposition. More importantly, in order to remain relevant, expand into the export market and have a presence on the ground in their relevant overseas markets, organisations need to look beyond the world of the customer and gain empathy with all stakeholders in the global value chain.

The outcomes of this approach are significant: manufacturers are able to clarify their organisational purpose by identifying exactly who their customer is, what they value, and why. From understanding the customer's motivations (the why) you may then explore value-laden business offerings (the what), corresponding business models (the how) and strategic partnerships (the who). This rich relationship with customers and stakeholders builds competitive resilience, as it is harder to replicate compared to technological gains. Key competitive insights will also lead to opportunities for market disruption.

The design led difference:

Immersion and deep empathy with the customer's world necessitates meaningful engagement with customers as co-innovators – while they are not responsible for innovation, they are heavily invested in the outcomes. The design approach to customer immersion imagines futures that customers cannot imagine for themselves. This goes beyond traditional market research process and begins with listening to your customers and stakeholders to reveal latent needs and opportunities.

Who are all your customers and stakeholders and what problem(s) are you trying to solve for them?

Is there a common view across the organisation of who is the customer?

How much do you know about your customers, not in terms of what features they want, but in challenges they are facing?

When was the last time you listened to your customer?

Create a definite representation of your customer beyond market segmentation.

Can you develop a journey map of how your customer engages with your organisation over time and identify areas which can be improved?

Achieve deeper customer insights and realise new opportunities.

Build empathy with all stakeholders.

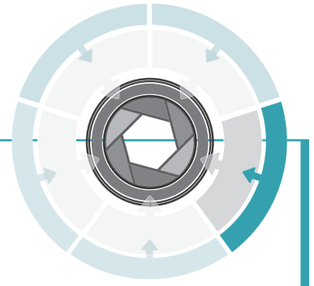
Communicate directly with your customer.

Adapt to new ways of reaching customers through current trends.

Use personas.

Be the Disruptor

change the ground rules



The scale and pace of the global market is such that competitive advantage through technological innovation is increasingly hard-won and short-lived. To be globally competitive the companies observed in this study created business models that envisage not only new products but also markets and services. This is a psychological shift from prediction via a rear view mirror, towards looking beyond the current market and envisaging new values and opportunities; organisations react not to what customers say they want, but are brave enough to consider entirely new directions.

The participating firms highlighted the significance of the pivotal moment of realisation in which their relevance as a business was called into question. This realisation - this 'jolt' when "one day my world changed" – created the opportunity for radically new directions to be explored. Realising the worth of this catalyst, several firms have chosen to deliberately trigger these reflections periodically, testing the validity of their business model by challenging the status quo.

This kind of productive scepticism needs to be supported by organisational leadership that is open-minded and tolerant of failure. The ability to persevere toward ambitious goals through uncertainty and discomfort allows firms to remain globally competitive. Business creativity by definition challenges present day assumptions; accordingly manufacturers need to accept failure and change as learning opportunities.

The design led difference:

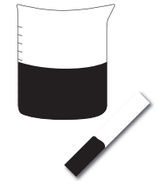
The combination of designing an organisational purpose and identifying deep customer insights places firms in the position but to envisage entirely new opportunities or disruptions, rather than reacting to old market opportunities. Disruption is utilised as a productive trigger of competitive behaviour by facilitating reflection and reframing. Creating a level of freedom within a business to explore new directions fosters a healthier view and approach toward risk and change.

Adopt new approaches to address your customers' challenges.

Imagine completely new directions which may disrupt your existing organisation. Embrace new ideas early on as they will promote discussion.

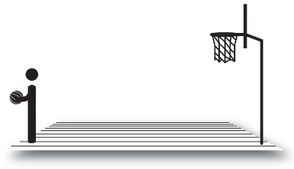
Explore these directions with your customers and then validate your ideas through your customers and use them to build on those ideas.

Map back these developments to your purpose to find alignment.



Regularly test the validity of your business model.

Accept failure as a key opportunity to learn.



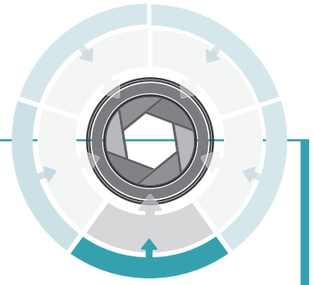
Persevere toward ambitious goals.

Look beyond the current market envisage new values & opportunities.

A "jolt" can expose opportunities to explore radical new directions.

Integrate Your Business Model

design for vertical integration



A working principle behind all companies interviewed was the focus on innovative business models integrated with innovative products as drivers of competitive success. All cited alignment around the company's purpose and the ability to innovate through influence or ownership within the global business value chain as being important. It is within this territory that the biggest gains around value capture may be achieved.

The differentiation from standard business model integration is in the incorporation of design principles into practice. In the same way manufacturers prototype product designs and iteratively refine their design and manufacture, so too should organisations be prepared to transform any aspect of their business model through a process of iterative trials and reflective refinements. There is no one correct business model; alternative models are developed in tandem and trialled in different markets in the act of learning by doing.

Moving away from a product-based view of business toward a more integrative outlook where innovations may come from any part of the business model means that the siloed management of business functions is no longer relevant. Investment in the intangibles such as brand, customer engagement, leadership and staff development are crucial. Applying design to your business model in this way encourages the application of design within a wider context throughout your organisational structures and processes. This is all supported by good leadership, focused attention to detail in execution and the ability to veto activities if they are not creating value for the organisation.

The design led difference:

Broadening the focus beyond the immediate situation (in this case from innovating at the product to the business model level) is an integrative practice of design. The business models are informed from identified organisational purpose, insights gained from the disrupting accepted business practice, and integration. The use of the design approach in experimenting and adapting its business model enables a business to become agile, prioritise investment and uncover new opportunities.

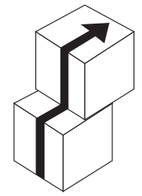
Translate your ideas into new business models of your organisation.

Avoid focusing on features and solutions, but on the activities and systems you require.

Compare this to your current business model to identify what activities and systems will need to be added to, deleted or transformed.

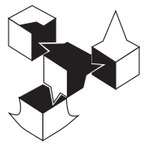
Prototype your new business model concept with your customers.

Engage your customers with some storytelling about your new business and start piloting new approaches that illustrate how you will add value to your customers.



Focus on innovative business models, not products.

Investment in intangible areas (e.g. branding) is crucial.



Be prepared to transform any aspect of your business model.

Apply a design lens to your business model.

Own the Change Experience

renewal is the new status quo

Australian manufacturing organisations need to become habitually dynamic to remain globally competitive. Evolution and renewal of a manufacturing organisation ensures its continuing relevance in the market and should be undertaken as a matter of course. Organisational renewal can manifest in, or arise out of new ways of operating, new organisational capabilities and measures of success or failure, and organisations need to be agile and flexible enough to manage such changes.

Of course, day-to-day operations cannot stop while business models, products and processes are being redesigned; thus any change should be piloted alongside and incorporated into business as usual. This approach is particularly important in light of the concern by many manufacturers that they are too busy surviving to invest additional effort and resources in trying new things. Indeed, for most organisations, consciously departing from a hard-won 'sweet spot' for the sake of innovation – when there is never a guarantee of success – seems counter intuitive. To master the art of organisational evolution, therefore, businesses need to persevere and develop the dynamic capabilities needed.

The design led difference:

This type of organisational learning can only be achieved through putting into practice (known as thinking by doing or prototyping within design). It results in an ingrained tailored approach and set of organisational values to innovation that cannot be easily transferred or copied. The process may appears ambiguous at first, but through an experiential learning model, design led innovation becomes more than an innovation program and becomes part of the DNA of the organisation.

Consider new approaches to address your customers challenges.

Visualise completely new directions which may disrupt your existing organisation.

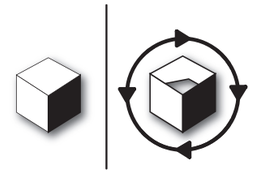
Embrace new ideas early on as these ideas are there to promote discussion.

Explore these directions with your customers.

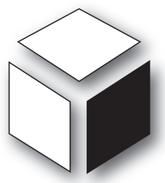
Validate your ideas through your customers and use them to build on those ideas.

Map these developments to your purpose and try to find alignment.

Evolution is needed to ensure relevance in the future of manufacturing.



Any change should be piloted alongside business as usual.



Organisations need to be agile and flexible.

New ways of measuring success or failure should be a matter of course.

APPENDIX 3

- Further reading

Further reading

In addition to the publications referred to directly in this report there are a number of other resources that will provide greater context of manufacturing and help to understand and apply design led innovation.

Australian Reports

The Future of Australian Business Trends: The Innovative Australian Organisation Accenture

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The Impact of Design on Business (2008) Design Council Briefing, UK Design Council

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Insight Report: The Global Information Technology Report: Growth and Jobs in a Hyperconnected World (2013) A World Economic Forum Report

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