

# Creativity, Design and Innovation

## Some thoughts

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Innovation is the successful exploitation of new ideas. Innovation is a *process* that starts with an insight, or an idea, or knowledge, and continues through application, adoption, and creation of value for end users. End user value is captured by businesses through enhanced profitability, ongoing viability and longer term sustainability. Innovation is not only about knowledge created through research and development; it is also about creativity and design.

Design *and* R&D are ways of channelling creativity for commercial advantage. Design is an important form of innovation in industry sectors that tend to invest less in R&D—such as furniture and clothing (Great Britain. Department of Trade and Industry 2005).

### 1.1 Perspectives on innovation

Innovation is something that organisations *must do* to be profitable (if they are a business), viable and sustainable. Businesses commit to innovation to create new customers and retain existing ones. In the public sector, departments and agencies innovate to ensure high levels of stakeholder and customer/client satisfaction.

Innovation is also important from an economy and industry wide perspective where the application of insights, ideas and knowledge lift the productivity and performance of an industry as a whole. Industry economists have tended to see innovation as a technical issue and have focussed on investment in research and development and technological innovation as a means to lift productivity. R&D investment is heavily concentrated in the manufacturing sector—although the link between R&D spending and sales growth at the business level is very complex (Jaruzelski, Dehoff, and Bordia 2006).

Innovation is also important in the services sector, which now makes up almost 80 percent of the economy. Services innovation in areas such as health, transport and logistics, building and construction, finance, insurance, retailing, and entertainment, is vitally important for international competitiveness and national productivity improvement. These industries have important interactions and dependencies with manufacturing. For example:

- Health services delivery (where the requirement for national productivity improvement is most pressing) involves an increasingly sophisticated range of pharmaceuticals, medical devices and equipment;
- Transport and distribution requires manufacture of efficient buses, trucks, planes, ships;
- 1 Building and construction requires manufactured materials with properties and characteristics that meet specifications on planners, architects, designers, etc;
- Financial innovations facilitate access to funds for investment, secure and efficient transactions, and new forms of equity and ownership;
- Insurance manages risks for rapidly growing global trade;
- On-line retailing allows for greater customisation; and
- Media and entertainment calls on a wide range of manufactured instruments, devices and equipment.

The Australian Government's recently released industry Statement *Global Integration: Changing Markets, New Opportunities* makes the point that:

The rapid growth of the services sector has been used by some to proclaim the 'death of manufacturing'. In fact, while its *relative* share of Australia's output has been falling for almost 50 years, the manufacturing sector continues to grow.

Over the last decade, real growth in manufacturing output has averaged 1.5 percent a year. Manufacturing value added, in real terms, increased by 16 percent to \$96 billion in the decade to 2006. The contribution of manufacturing to the Australian economy remains higher than that of agriculture and mining combined.

... [the] trend of slower growth of manufacturing vis-à-vis the services sector, leading to a relative decline of manufacturing, is typical of developed countries.

Innovation is also important in general government – where constituencies are expecting increasingly higher levels of performance in service delivery. There have been, for example, significant innovations in service delivery at Centrelink, Medicare, the ATO, and the Australian Customs Service. (AQIS is perhaps lagging).

All of these agencies are significant users of ICT—which is a major enabler of innovation in the services sector.

## 1.2 Innovation at the interface

Many researchers and commentators have observed that innovation occurs at the boundaries of *businesses*, through business-to-business and business-to-university collaborations and through cluster type arrangements. It is also the case that industrial innovation occurs at the boundaries of *industries*—this is clearly the case when looking at many manufacturing and services innovations.

*In the context of the post-industrial and knowledge based economy the demarcations between the manufacturing and services sectors are becoming increasingly blurred as customers rely more and more on the service value of the products they acquire.*

When talking of the services sector, we are thinking not so much of hotels, cafés and restaurants, wholesale and retail trade, and a range of outsourced business services; we are thinking of health services, transport, construction and a range of other knowledge intensive services sectors. Innovations in these areas, often initiated by people educated, trained, and practicing in the areas of art, design, and architecture, (and more generally, the arts, humanities and social sciences) “pull through” innovations in manufactured products and ‘service packages’. The pull through effect of Australia’s construction industry working in Asia is a case in point<sup>1</sup>.

In the modern service oriented economy many manufacturers are spending a lot of time finding out how customers actually use their products—and are quite often surprised with the results. Moreover, innovation in manufacturing is seeing a much greater role for social scientists, including psychologists, sociologists and ethnographers, as well as designers and architects. In innovative manufacturing businesses, such as Holden, these professionals work side by side with the scientists and engineers—the industrial age innovators.

It is also the case that many manufacturing businesses are transforming themselves into *de facto* services businesses: for many manufacturing is no longer “core business”. The task of finding and keeping new customers through customer relationship management and creating unique service offerings is a much greater source of value. For example, a Sydney company that once made black and white television sets is now providing high value repair and maintenance services for the defence force, and for global airline companies, using its core engineering capabilities in avionics. The company is a significant employer.

Increasingly manufacturing employment is being constituted by a growing proportion of engineers, designers, researchers, and other professions and shrinking proportion of manufacturing workers. Our work has indicated that there is a need for higher education and VET institutions to develop closer relations for education and training in the skills required for this work environment (Howard Partners 2007a). This has been addressed recently in the UK through the Leitch Review of Skills (Great Britain. Treasury 2006).

## 1.3 Services innovation as an enabler of innovation in manufacturing

The challenge, and the opportunity, for manufacturing is to move beyond a production and sales centric approach, dominated by engineers, factories, and sales forces, to one built around creativity

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<sup>1</sup> This point came through in our recent review of the Victorian Agenda for New Manufacturing Howard Partners. 2006b. *Evaluation of the Agenda for New Manufacturing*. Melbourne: Department of Innovation, Industry and Regional Development.

and design, engagement marketing, and customer service. Innovations and breakthroughs in the technological characteristics of a product may be insufficient to attract customer attention and create value. It is sometimes said that companies in food and grocery manufacturing spend more time and resources branding and designing the packaging than working on the contents. Many companies in these sectors (for example, Luken and May) outsource the entire manufacturing process.

Notwithstanding this growing integration between manufacturing and services, *there is still a gap between end user wants and industry's ability to deliver value*. This has given rise to the concept of “services science” which aims to link technological advances with innovation in products, processes, services, and ways of doing business. It seeks to combine technology developments, through, for example, information and communications technologies (ICT), nanotechnology and materials science, with the potential application of those technologies to create novel service offerings that penetrate existing markets and open new markets that do not currently exist.

These innovations in manufacturing were clearly evident in the work that Howard Partners completed for the Department of Communications, Information Technology and the Arts on the use of ICT in “non-ICT” manufacturing (Howard Partners 2005a) and for the Business Council of Australia (Howard Partners 2006a) in relation to innovation practices in Australia’s larger firms. In the domain of innovation there is a need for manufacturers to think not only about creating novel products and processes but also to think about new ways of creating and retaining customers through new and emerging technologies.

In the current industrial climate many innovative manufacturing businesses are positioning themselves as services businesses (e.g. Fosters as a ‘brand’ portfolio), or have transformed themselves into services businesses (e.g. Orica mining equipment), or have developed strategic alliances with or purchased services businesses (e.g. IBM purchasing PricewaterhouseCoopers consulting) to provide a ‘front end’ interaction and engagement with customers. Many of the changes have been organic; others have been imposed through equity investors seeking to revitalise under-performing manufacturers (e.g. Bonds clothing).

The challenges for manufacturing in terms of globalisation, the role of multinational enterprises, supply chains, research and development, developing business and general management skills, market access and interactions with universities and research organisations, are well known and well rehearsed (Australia. Minister for Industry 2007; Howard Partners 2005b; National Manufacturing Forum 2006). What is required is a new way of thinking about manufacturing development issues— from the perspective of innovation as a business issue and the interactions between manufacturing and other industries.

Innovation will occur by addressing the *context* of innovation and the way in which the manufacturing industry intersects with other industries and looking for opportunities to create value for businesses in NSW.

Context means looking *outside* manufacturing and asking questions such as—what is going on in health services, transport and distribution, travel, building and construction, etc, as well as in agriculture, mining and energy, that will impact on manufacturing? For example, wind power generation is calling for new skills and capabilities in manufacture of wind turbines and blades. These require precision tooling and use of composite materials as well as people with high level skills and trained in relevant technologies. Innovation is about anticipating and being ahead of the game.

Services driven innovation also means addressing skill requirements in the arts, humanities and social sciences—as well as manufacturing industry skills historically linked to engineering and the applied sciences and technologies. There are shortages in these areas, but the focus needs to be inclusive in its orientation. Businesses are indicating strong demand for skills in these areas.

*A major focus for policy will be the way in which the manufacturing businesses can stimulate ideas and creativity from within as well as collaborating with people and organisations outside their businesses, and their industries, in the search for insights, new knowledge and new ways of doing business. It will also need to focus on the role and contribution of the creative industries, such art,*

*architecture, and design, as well as the humanities- such as music, language and culture in stimulating innovation in manufacturing.*

The focus on skills, and a broader concept of innovation across industry is seeing new forms of cooperation and collaboration between higher education and industry. There has been a shift in emphasis away from the narrow concept of 'research commercialisation' to one that emphasises integration of teaching and learning through an integration of academic and occupational skills development.

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