The Innovation Case Study Library

IntelliDesign Smart Solutions

The Innovation Case Study Library is a key deliverable under the Queensland Science and Innovation Action Plan to showcase local business innovation and entrepreneurship. This library provides a suite of localised content to inform and inspire local businesses and students in Queensland schools and universities.

Queensland
Government

We are better this year than last year and we will be even better tomorrow

Overview

Industry
Electronics Engineering

Situation
There are 'gaps' in the systems many companies rely on because either their processes have specific needs not easily met by generic products or, the gap is considered too difficult or costly to fill.

Solution
Specifically-tailored and highly-functional electronic products and support services

Above from left:
Robin Bishop (financial controller), Chris Bishop (managing director), Andrew Ward (engineering director), Shelley Ward (resource manager)

About IntelliDesign

IntelliDesign was formed in 1995 by Dr Chris Bishop and Dr Andrew Ward (their partners, Ms Robin Bishop and Ms Shelley Ward, also are directors of the company). The company has grown to now employ approximately 50 staff who design, manufacture and maintain highly specialised electronic equipment for businesses across a wide range of industries including health, defence, telecommunications, mining, law enforcement and transport.

To appreciate the success of IntelliDesign it is important to understand the background of the managing directors, Chris and Andrew. Chris has professional training and experience in medical research. He is acutely aware of the importance of electronic devices being reliable, easy to use and meeting highly specialised needs. Andrew, on the other hand, is a Harvard-trained electronics engineer with particular expertise in electronic design. The value of this combination is clearly evident in the products they manufacture – highly-advanced electronic products designed to the exacting requirements of demanding work places. Add to this their commitment to continuous improvement in quality and it is clear why the business has been successful.

However, the success of the business is much more than a simple projection of the capabilities of its founders. IntelliDesign has overcome significant obstacles to build an innovative culture and capability, and how it continues to adapt to improve its competitiveness for the future.

The business model – elephants or gazelles

Chris Bishop describes the business approach to the marketing of IntelliDesign using the metaphor of hunting for either elephants or gazelles. IntelliDesign hunts for elephants – it thrives on having a few large, difficult, distinctive (high cost, low volume) projects – the type of projects for which "gazelle hunters" (high-volume, low cost suppliers) generally have insufficient expertise and resources.

IntelliDesign is, at its heart, an engineering Original Design Manufacturer (ODM) business at the top-end of expertise in electronic devices. Its business model has three distinctive attributes that help to position the company in a competitive market place.

Firstly, by controlling the entire supply chain from design to manufacture (and maintenance) IntelliDesign is able to fully integrate product design and manufacturing processes. Supply-chain integration also enables IntelliDesign to guarantee product quality and defray some upfront design costs across the manufacturing process.

Secondly, IntelliDesign partners with customers to share the risk of innovation. IntelliDesign is prepared to take on a significant proportion of the financial cost of the design phase (often worth hundreds of thousands of dollars) in return for guaranteed quantities in production once the client is satisfied with prototype performance.

This is another benefit of controlling the full supply chain and has the spin-off of helping to keep the business sharp and customer-focused.

Finally, IntelliDesign is relentless in striving for quality. Many of its products are used in highly sensitive and demanding environments dealing with issues of health and safety.

It is critical that each component within the product is traceable to a specific manufacturer or supplier so that every aspect of product performance can be comprehensively monitored. How IntelliDesign has achieved this is discussed in more detail later in this profile.

Example
Safety and efficiency in bulk chemical delivery

Customer
Orica New Zealand

Industry
Chemical manufacture and distribution

Situation
Orica New Zealand supplies a wide range of
chemicals, including acid and alkali, to a variety of
industries including dairy factories. The chemicals
are delivered in multi-compartment trucks, with
each compartment holding a different chemical.
While these deliveries are subject to strict regulatory
conditions and safety standards, the delivery of the
wrong product into the wrong tank could potentially
cause significant structural damage, injury and/or
loss of life.

Solution
Developed with IntelliDesign, the Orica Correct
Delivery (CoDe) system uses Radio Frequency
Identification (RFID) technology to verify the chemical
compatibility of load-in and load-out points as
well as to continuously monitor the integrity of
connecting hose lines. The system utilises an
embedded computer installed on each trailer
which communicates with portable wireless RFID
readers, a Human Machine Interface (HMI), a valve
lockout system, a pump interlock, and audio/visual
indicators.

Outcome
CoDe has been installed throughout Orica New
Zealand's delivery fleet, Orica sites, third party sites
and customer sites. It has wide acceptance amongst
users and has won a New Zealand Health and Safety
Award and an Australian Good Design Award.

Innovation at IntelliDesign - without and within

Innovation at IntelliDesign is not overt. It is not expressed as entrepreneurial zeal. Nonetheless, it becomes very clear when visiting IntelliDesign and talking to its people that innovation is at the heart of the company - not so much a conscious business strategy as a way of life. This flows from the top, drawing on the successful research and development backgrounds of Chris and Andrew, to become imbedded in every aspect of the business.

Chris describes innovation as being both 'without' and 'within' the business. 'Innovation outside the business' characterises their relationships with their clients. Often a client will come with a problem they themselves don't fully understand other than there is something in their business process that is causing problems – a gap in an otherwise relatively efficient operation.

The reason there are gaps is because the particular process step is complex, both in terms of the number and types of inputs and outputs as well as the complexities within the process step. For example, Orica New Zealand (refer to the case study on the previous page) needed highly reliable logistical processes to deliver a range of potentially volatile bulk chemicals to customers in safety-sensitive industries. In this situation innovation is featured in the way IntelliDesign works with the clients to clearly understand the problem, design a solution, build and test prototypes and progress to manufacture.

Innovation within the business is just as important for business success within the business. IntelliDesign's commitment is typified by the decision to build its own in-house enterprise management software system. The decision to build rather than adapt one of the many available systems was not the first preference. However, in reviewing what was available

in the market, the directors realised that none of the options met their specific requirements, particularly for integration and traceability.

Implementing a system that might compromise their exacting quality standards was against their nature and so the only option for IntelliDesign was to develop its own software to its particular standards, just as they would for a client.

As a result, the business has achieved what many aspire to – a paperless production area. All assembly and test procedures and associated test records are available to staff via terminals on every workstation. In addition, every product manufactured by IntelliDesign has full traceability through its entire life-cycle, from initial manufacture to upgrades and maintenance.

IntelliDesign relies on four main approaches to marketing its services: building on success, industry participation, trade shows and supplier-loyalty.

Building on success
Much of IntelliDesign's new business flows from the success of past projects. Many of their clients are large private and public organisations that are in continuous states of change. IntelliDesign works hard to establish and maintain strong partnerships with clients to position itself for new opportunities.

Industry participation
Chris Bishop describes the state of the electronic industry in South East Queensland as being buoyant and highly innovative, notwithstanding the current difficult economic climate. There is a critical mass of businesses linked in with universities to maintain and improve strong skills in engineering and design. [cont.]

We think of innovation as being both 'without' and 'within' the business. 'Without the business' we focus on developing highly tailored solutions to problems that often customers don't fully understand. 'Within the business' we strive for continuous improvement in all our systems.'

Dr Chris Bishop, Managing Director

Watch how collaboration defined innovation in IntelliDesign

▶ click here for the video

IntelliDesign is active in contributing to industry forums through which it profiles its own distinctive capabilities. Forums also enable staff to learn from other businesses and work collaboratively with universities and governments to build market opportunities.

Trade shows

IntelliDesign is active in participating in trade shows, sometimes with the support of the Queensland Government. It can be difficult to know which events to target because of the breadth of industries IntelliDesign works with. Chris and Andrew have learned that the value of participating in trade shows often comes from developing relationships with other exhibitors.

Many of the off-the-shelf systems marketed by large companies do not meet the specific needs of individual customers, a situation that IntelliDesign explicitly targets. The most likely result of a trade show is that a partnership is formed between IntelliDesign (offering specialist skills) and a large company in a specific market (offering industry knowledge) to develop a new, market-leading product that better meets the client's requirements.

Supplier loyalty

IntelliDesign has learned that their suppliers can be an important source of new business. Component supply companies often are the first to learn of the problems of other clients that IntelliDesign might help solve. IntelliDesign selects suppliers carefully and builds long-term partnerships that support high standards of product quality and a commitment to innovation.

Innovation awards

IntelliDesign does not regularly pursue business awards. Nonetheless, the directors are pleased that their long-term commitment to design and innovation has been recognised through:

2012 Powerhouse Museum Selection
Orica CoDe System

2012 Good Design Selection (business & technology)
Lynx X4

2012 Good Design Award (business & technology)
Orica CoDe System

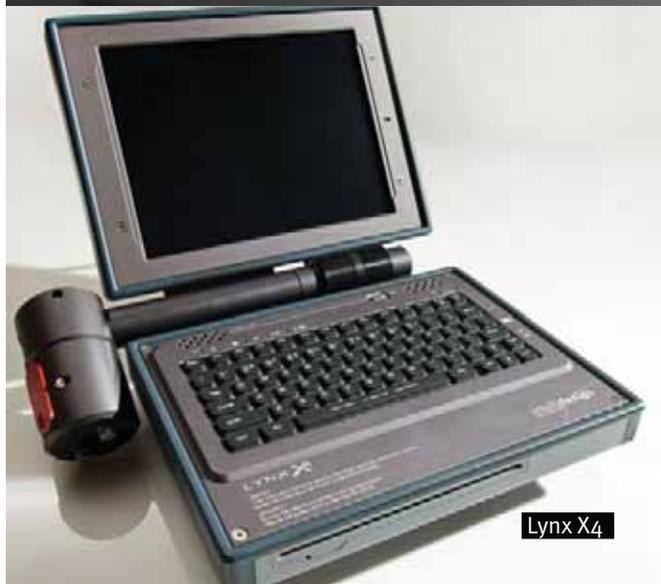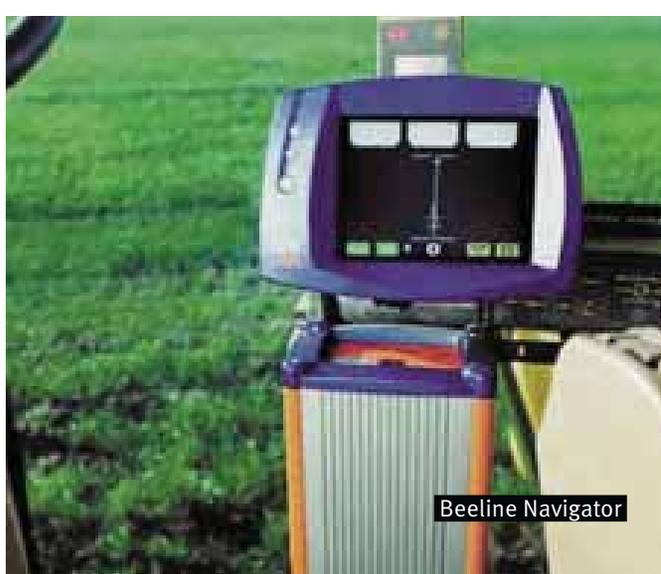**2009 Good Design Selection (automotive & transport)**
Bus Driver Display

2005 Good Design Award (housing & building)
Standpoint

2001 Good Design Award (consumer)
Beeline Navigator

Beeline Navigator

Standpoint

Bus Driver Display

Lynx X4

Orica CODE System

Example
Care and precision helps create a new life

Customer
Cook Medical

Industry
Medical – Assisted Reproduction

Situation
Cook is the largest privately-owned US medical device manufacturer and a world leader in assisted reproduction. The first step of the in-vitro fertilisation (IVF) process is the efficient collection of oocytes (eggs) from the ovaries of donor females. To achieve this Cook required a safe and cost-effective aspiration system that provided a low flow, regulated, negative pressure.

Solution
IntelliDesign developed the Cook's K-MAR-5200 Vacuum Pump to meet Cook's exacting specifications, including ultra-quiet operation, rapid response and precise control. The use of illuminated capacitive key switches provides a smooth, easily cleaned front panel that minimises the chance of contamination. In addition, the K-MAR-5200 satisfies the demanding requirements of ISO13485, CE mark, Restriction of Hazardous Substances Directive (RoHS) and Underwriters Laboratories (UL) certification.

Outcome
The K-MAR-5200 has been exported globally for over seven years and continues to be the industry's IVF vacuum pump of choice.

The design studio after its 2012 fire
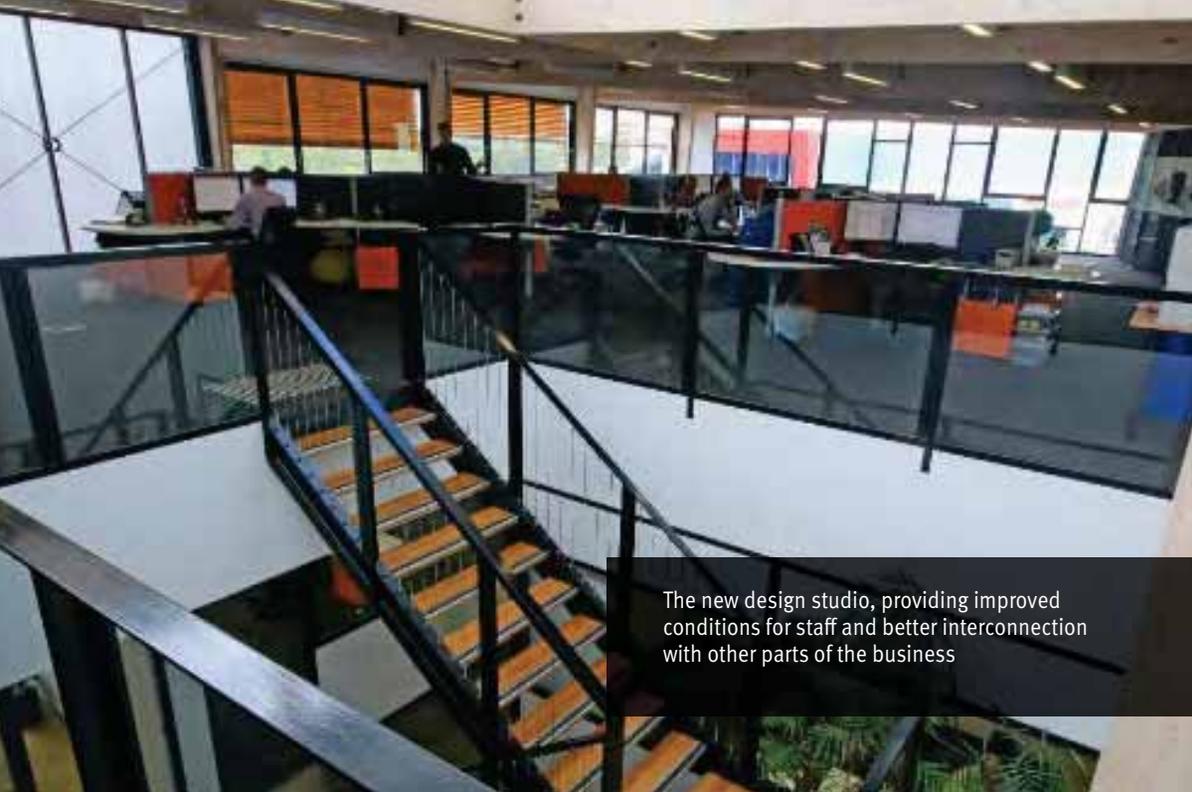
The new design studio, providing improved conditions for staff and better interconnection with other parts of the business

Overcoming obstacles – out of the fire!

In 2012 an electrical fire destroyed part of IntelliDesign's Seventeen Mile Rocks premises, rendering their only facility unusable. It was a devastating blow to the company, which like most businesses was still recovering from the after-effects of the 2008 global financial crisis.

Walking away from the business was a real possibility for the directors. In the end, they decided to rebuild both the facility and the business. 'The Fire' is now talked about as being a defining event in the company's history – a case of a physical event becoming a metaphor for the company's resilience and values.

For some months the company operated out of a number of premises nearby. While this was difficult, it invoked a commitment among staff to make it work. Rebuilding opened up an opportunity to improve the design of their offices, design studio and manufacturing facilities, to raise expectations for moving back.

Progressively as parts of the new building became available, teams were able to move back until eighteen months later, in December 2013, the company was once again under one roof.

The response to the fire now characterises the ethos of the company. There is a strong drive to succeed, or as Chris Bishop says, 'we assume success'. This is not a slogan or aspiration, but a strong underlying belief in their ability to get through anything.

This belief is at the core of the culture that IntelliDesign leaders seek to create. They instil this approach through an active training program, particularly to reinforce the commitment to quality and innovation.

The directors take their responsibility to the community seriously, supporting a number of local charities and events. At the end of the day, they believe their most important community contribution is through providing 50 secure jobs. 'That's what motivates me to get up each day' explains Chris Bishop. 'Knowing that 50 employees and their families are able to create a future for themselves gives all of the directors a great deal of satisfaction'.

The future

The business environment remains tough. Many companies within the industry have gone out of business or are under pressure. IntelliDesign recognises that past performance alone will not guarantee future success.

There is an active conversation within the business about the future. The strategic plan, mission and values are reviewed periodically to continually clarify 'who we are.' In the current cycle there is recognition that the company now holds considerable intellectual property (IP) and capabilities. While it will remain a designer and manufacturer of distinctive, original solutions in niche markets, it proposes to explore opportunities to develop a small range of standard products for particular markets where emerging needs match its expertise and IP. In particular it is exploring opportunities to deliver rugged mobile communications platforms, initially for transport and other utility industries. Any new opportunities will always be pursued through partnerships.

Partnerships are at the core of the IntelliDesign approach. The future includes strengthening industry partnerships to position South East Queensland more strongly internationally. IntelliDesign has recently improved its ability to work directly with South East Asian suppliers and markets.

One of the most important determinants of the industry's future growth, is skills. While the region's universities are delivering graduates with high-quality design and engineering skills, IntelliDesign's leaders are concerned that there is insufficient focus on the technical skills required for electronics manufacturing. They are keen to develop partnerships with technical education institutions to address this gap.

Find out more
To find out more about IntelliDesign please visit: www.intellidesign.com.au
If you have an innovative idea and want to explore your support options visit www.business.qld.gov.au

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