

CASE STUDY

B&R Enclosures



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IMAGE CREDITS

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B&R Enclosures

Operating since 1955, B&R Enclosures (B&R) is a Brisbane-headquartered, 100% Australian family-owned company that designs and manufactures stainless steel, steel and plastic enclosures and cabinet solutions such as those used to house electrical and computer network equipment. The five divisions of B&R reflect their diverse markets - Industrial, Data ICT, Hazardous Areas, Residential/Commercial and Defence. With six manufacturing locations, three overseas and three in Australia, the largest in Brisbane, and some of the world's largest companies as customers, B&R produces both standard 'off-the-shelf' solutions and innovative, bespoke products customised for the client. The company is known for high-quality solutions delivered with short lead times, enabled by a culture that embraces technological innovation. For example, new technologies including laser welding, laser cutting, automated robotic punching and bending machines, and robotic gasket application machinery have all been implemented in the Brisbane manufacturing facilities in recent years.

Digitisation of business processes is a current focus in B&R's journey toward Advanced Manufacturing. B&R are actively moving from paper-based processes to technology-driven solutions to digitise many aspects of their business from interactions with customers during the design process through to developing a supply plan and scheduling jobs

on the shop floor. B&R are currently undertaking a large project to provide an end-to-end fully digitised workflow solution. Digital integration software is being incrementally implemented using agile project management methodology. The system uses 3D technology to co-design custom solutions with clients then create project templates, chart the manufacturing process, and schedule and assign tasks through to delivery date. It replaces many existing paper-based processes and represents a significant change in day-to-day operations.

B&R Enclosures represents a company that has been on a strong and steady trajectory toward Advanced Manufacturing. Their experiences demonstrate that advancing manufacturing toward Industry 4.0 requires both large-scale automation and technology implementation alongside incremental technology-enabled process changes. As the Group HR Manager explains, "At B&R, we're using agile methods to drive continuous improvement through small amounts of change frequently to transform without creating massive disruption". B&R illustrates how long-held paper-based systems can be revolutionised through digitisation, creating a more efficient workflow, providing faster and more comprehensive services to customers, and improving the jobs and work environment for employees.





PAA 1

Positioning the manufacturing workforce as a key player in the journey towards Advanced Manufacturing

Agile, people-centric culture

The workplace culture at B&R enables the journey toward Advanced Manufacturing and is characterised by a willingness to build the capabilities required to improve its manufacturing processes. This capability-building extends to investing in technology and systems as well as in its people.

B&R culture is 'people-centric' - employees are valued and cared for, and encouraged and supported to develop their skills through significant investment in development opportunities. The emphasis on developing staff provides a sense of security for staff, enables agility within the workforce and fosters a readiness to adopt technology.

It's really about providing roles and opportunity to get qualified and excited to do better, to experience challenge at work Depending on the needs of the business or the market, the business can move quickly, and our people move with it.

- HR Manager



New technologies have been consistently explored and adopted over time to improve output or product quality or create new products/markets, with little resistance from the workforce.

...When we do bring in extra equipment, like automated robotic equipment, the feeling is definitely more of excitement.

- HR Manager



The holistic approach to capability building is supported by investing in the capability of their people, as well as in manufacturing systems and processes.

B&R is a company that takes capability improvement seriously. Equipment and systems are important ... whatever the tools required for us to make our product better and deliver valued outcomes for our internal team as well as the external customer.

- Customer Projects Manager



Innovation and investment to grow

B&R's investment in technology has been consistent over the past few years and has included the purchase of a fully automated fibre laser welding machine, an automatic punching and bending machine, and a laser cutting machine. Investment in robotic machinery and new technologies is undertaken strategically to maintain and improve B&R's proposition in a competitive market.

The company has been able to in-source some processes and innovate its product lines. For example, robotic technology has aided the automation of some product lines, and enabled B&R to expand beyond providing standardised metal boxes to providing custom products and to producing more products overall.

We are [now] able to offer a complex product, an enclosure that houses and protects technical equipment. ... We are able to provide more complex solutions, not only a box but fully featured ... [with] the robotic equipment, fully automated lines we are capable of adding during the night ... some products we are able to make while no-one is here.

- Technical Services Manager

Electrical and component integration into our enclosures is increasingly a core part of the business. We used to manufacture the enclosure and give it to switchboard builders to do the electrical integration, and now we have started to bring that work in-house, providing extra value to these end customers.

- Customer Projects Manager



Investing in new technology has also improved quality and signalled to the market that B&R has strength of capability and reliability, which has been instrumental in its recent success in winning a Queensland Government Cross River Rail project tender.

[Technology is implemented] just to improve the quality of product, what we are, what we supply to the customer as well as it gives us an opportunity to win major tenders, major projects, having that capability ... example, the Cross River Rail project.

- Customer Projects Manager



There is, however, an acknowledgement that processes still require improvement for the organisation to be globally competitive, and knowledge of techniques and technologies available in the broader market is a barrier.

We compete mostly against companies which are overseas - in China and Europe and [the] USA. If we don't have access to knowledge, new technologies, what's available in the market or the techniques or methodologies, we might miss opportunities.

- Technical Services Manager



Communication and challenges of constant change

Change at B&R is undertaken with relatively lean resources. There is no change management team, so new implementations are overseen by managers and supervisors, who follow a change methodology. For example, the implementation of the digital integration software required digitisation of a range of processes across different departments, so agile methodologies have been adopted to support incremental change.

This process is led by two key senior managers in operations roles. Some technologies, however, must be implemented in 'one big bang', which brings different challenges.

Regardless of the methodology adopted, constant change with lean resourcing does result in change fatigue, particularly for managers at B&R who often drive the change. Communication is key to managing the change and 'getting employees to trust that the system will eventually work' (Production Manager). One simple communication activity that B&R use is a monthly 'Canteen Briefing', which is open to all staff to attend to hear leaders informally update on key projects, sales, milestones and other important news. These are supported by twice yearly formal full company briefing sessions to review progress and results.

Importantly, the communication process must include everybody. There's no point implementing something [if] people don't know how to utilise it. The leaders communicate changes and share the knowledge of what's expected and how to achieve this efficiently, through training.

- Supply Coordinator



Through digitisation of processes, data is increasingly being used in the communication process to identify areas for improvement that may not have been previously acknowledged.



Building capability from leaders down

B&R's commitment to building the capability of systems, processes and people derives from the CEO and leadership team. Senior leaders have a visible concern for employees and a genuine, active interest in technological and process improvement.

These attributes are coupled with broad experience working in junior roles in the company, which has given them deep knowledge of processes and where improvements can be made, and the credibility to drive the change.

The management of B&R has really invested a lot of money in technology and also people with technological mindsets. A good example is the Engineering Manager who has very strong technical acumen He's been here ever since he was a teenager, and he knows the company inside out and he actually grew with the organisation and now, being in charge, he's brought in a lot of innovation.

- Quality Manager

[Our] co-CEO, his greatest joy in life is to research and apply machinery solutions He started at B&R as a production worker, then moved into maintenance, then into design, did his Bachelor of Engineering. Now he's finished his MBA. So, he's very knowledgeable mechanically.

- HR Manager



A similar innovation and improvement mindset exists in managers new to the company.

We've just recently employed a new manufacturing manager who's already driving improvements with our internal and IT systems, because he brings a lot of good knowledge. He has worked in lean-focused organisations, so his knowledge on lean manufacturing and Advanced Manufacturing is extremely high.

- Production Coordinator





Tailored leadership development

Consistent with the people-centric culture at B&R, team leaders and managers have usually been developed from within the workforce by moving people into different roles as change occurs, thereby providing a career path for manufacturing employees, despite a relatively flat organisational structure. B&R encourages and values a wide range of knowledge for its team leaders and managers,

including technical knowledge coupled with 'soft skills'. This knowledge is built through exposure to different roles, and exposure to experts from outside the organisation through membership of the Australian Industry Group. University or vocational education and training (VET) are not perceived to be sufficient to build the right mix of skills and experience.

From my perspective, it is important to be multi-skilled, as well as expert in one key area. You have to have a wide spectrum of knowledge, expertise, experience, such as problem-solving, conflict solving, communication. We need people who can coach effectively.

- Technical Services Manager



Beyond on-the-job training, development for leaders is tailored to the individual and is usually short and focused.

At B&R, if a manager says, 'Hey, I'm not too sure how to deal with conflict', either HR will try and get them some tips or advice or find out if they need formal training.

- Production Coordinator



Capability gaps in technology knowledge

The COVID-19 pandemic highlighted the reliance of Australian manufacturers on overseas-based technology suppliers for support in training, maintenance and parts. As it does for other manufacturers, an inability to access parts and/or

services when they are needed, risks interrupted production and creates additional challenges for B&R, pointing to the need to develop capabilities within Australia.

The equipment technology is there to help us produce more efficient, better quality products, but to gain the knowledge of how to use and maintain the equipment, that is still in development, requires constant attention of the manufacturer, located overseas. Nowadays we can only do Zoom meetings, emails and phone calls because we cannot get the technician here.

- Technical Services Manager



B&R were recently the subject of a cyber attack. Ransomware affected many of their systems, stalling production. Through the institutional knowledge, tenacity and agility of their workforce, B&R was able to temporarily revert to manual systems to minimise disruption.

For B&R, this attack highlighted the importance of tougher cyber security and back-up systems, and the value of tacit institutional knowledge held by long-serving employees.



We are painfully aware that any companies moving into digitising and connecting their information online need to make sure their cyber security is tight.

- HR Manager





PAA 7

Building a highly skilled, adaptable and capable existing workforce

Changing jobs, expanding skill sets

Digitisation and automation have changed how work is done. For example, the way that jobs are coordinated, removing 'manila folders' and the need to 'run around the shop floor' (Supply Coordinator).

We're taking the digital approach. Instead of collecting all the paperwork, manually reporting all the jobs in the system, we've implemented procedures where the shop floor can report the job themselves instead of somebody else having to collect paperwork and manually go and scan every job card and report it in.

- Supply Coordinator



Computer literacy is becoming increasingly important, as is the ability to read and interpret data and, for some roles, programming skills.

It's shifting more from the manual work to more the administration and thinking 'data, data, data', input data, reading and analysing the data as well.

- Technical Services Manager

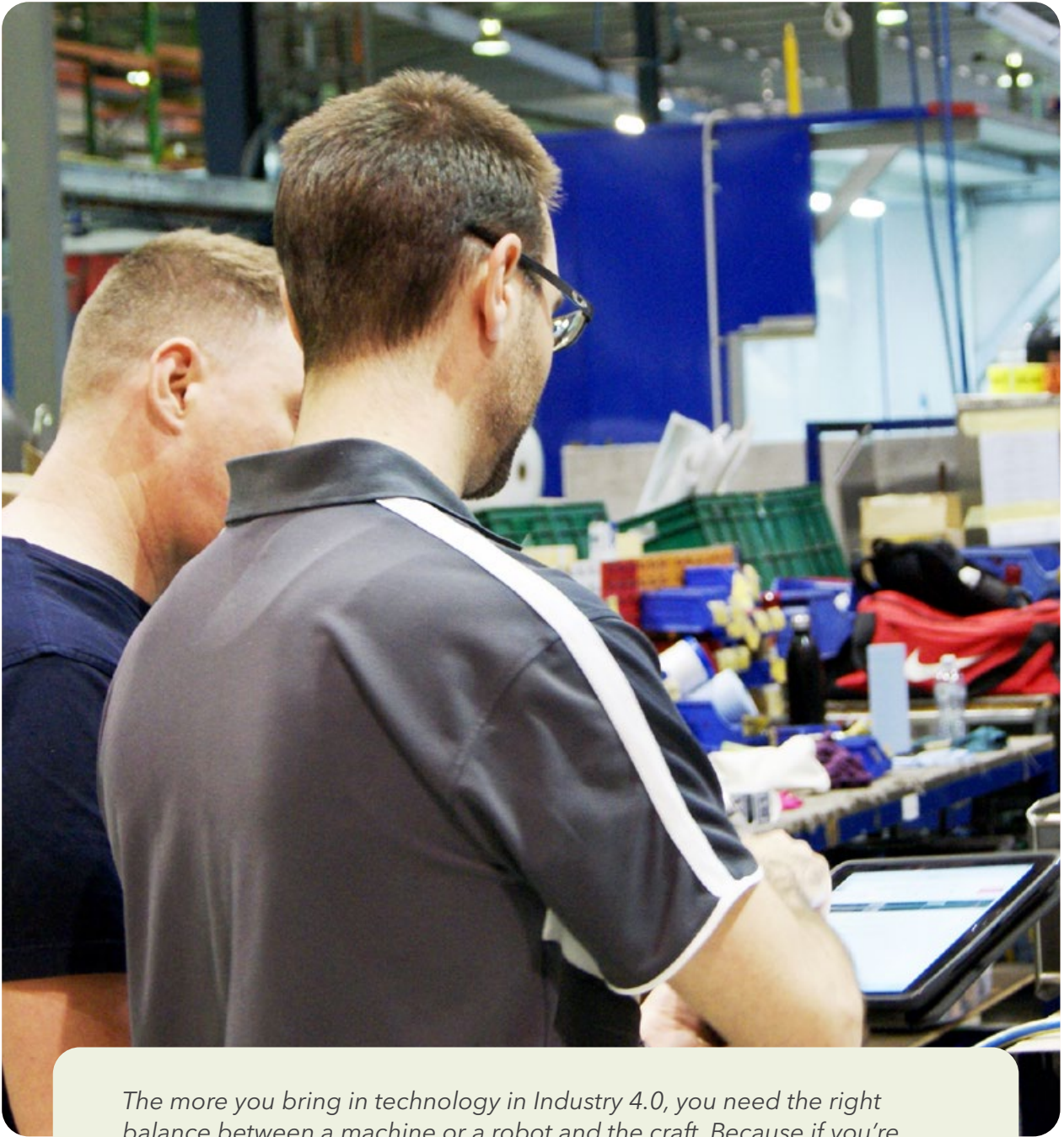
Everything that we have on our shop floor relies on programming. If you get the programming right, you get the machine running right. ... So, understanding software, understanding programming. ... I think this is a key technological technical skill.

- Health, Safety and Quality Manager



The basic trade or 'craft' skills, however, remain at least equally, if not more, relevant. B&R recognises the need for recent university graduates in industrial design and engineering to learn from and work with experienced trade workers so that they have the capacity to design more practical solutions.

This mix of craft skills with mechanical and engineering qualifications and technology is essential for the move toward Industry 4.0.



The more you bring in technology in Industry 4.0, you need the right balance between a machine or a robot and the craft. Because if you're going to be able to operate a robot welder, for instance, you still need to understand the tolerances of sheet metal and what a good weld looks like, so I think that you can't forget the craft Our designers are either mechanical engineers or industrial designers. At university they do a lot of work with other materials. Light sheet metal is not a common material that they've worked with, so a lot of our designers have also done short courses in welding to know, practically, how metal forms when you bond it together. So that's all about focusing on craft with our designers so that they can design more practical designs for the shop floor.

- HR Manager



Supplementing qualifications

Consistent with its culture, commitment to capability-building and approach to recruitment, B&R invest heavily in developing the skills of their people. University or trade qualifications alone do not provide the necessary skills and knowledge to address the day-to-day needs of the business, and finding workers with the required experience is difficult, so skills are built in-house through a variety of on-the-job and structured training programs.

Job rotation is used to develop knowledge of the manufacturing process at B&R, and to cross-skill their workers and build capability across the workforce.

Rather than new technology resulting in job losses, job rotation and cross-skilling is enhanced through the implementation of new technology.

Trade qualifications are encouraged, but B&R have found that job-relevant experience is also needed to link course learnings to practice. For example, a Certificate III in Fabrication is provided onsite. The HR team coordinates with the training provider to facilitate sessions, and production supervisors work with the training provider to ensure on-the-job experience and observation. This has been very successful in developing the skills required and attracting workers to the organisation.

We recruit employees that join B&R based solely on the course that we can offer.

- Production Coordinator



Skills and labour shortages

As noted, finding the right skills in the labour market has been a constant challenge and necessitated investment in building in-house capability.

One of the key challenges is having skilled people to do the job with the right qualification and right experience. For instance, when building a switchboard, we need an electrical engineer who has good design experience in that area. Getting the right people is always a challenge for us. We often struggle with getting the right skill set from the market.

- Customer Projects Manager



For this reason, B&R focus on finding staff with the right attitude, who are willing to learn a craft and potentially go on to study a trade, design, management or other qualification.



PAA 8 | Increasing the diversity of the manufacturing workforce

A diverse workforce

The workforce at B&R Enclosures is diverse. Workers span a wide age range, are drawn from diverse ethnicities, with a large immigrant workforce, and an increasing number of women are entering technical and traditionally masculine roles.

I've seen more women on our shop floor. I've also seen a new electrician in our electrical integration room who is female I'm also seeing the younger generation coming into B&R.

- HSQ Manager



Anecdotally, technology and new ways of working have facilitated this.

The physical aspects of the work are not so important.

- Technical Services Manager



One female manager explained how the move from paper-based to new technology has enabled remote working and facilitated greater flexibility to be able to manage her work and childcare commitments.



Having that functionality to work from home is a big thing ... It's been a great benefit to have that functionality and be able to remote access my work.

- Female Manager



Attitude and diversity mindset

The benefits of diversity are acknowledged at B&R Enclosures, and while the small size of the HR team makes it difficult to resource specific campaigns to build the diversity of the workforce, there is a broad recognition that increasing diversity is good for the business and the sector.



It's not so much about making enclosures, it's about employing people no matter what their background ... It's really about giving people jobs and opportunity.

- HR Manager



B&R's agile, people-centred culture is reflected in their approach to recruitment. The HR Manager explains: *'we employ based on attitude and skills, not based on where people come from or who they are'*.

B&R is seeking to do more to increase gender diversity and employ more First Nations people, but resourcing and a general shortage of skilled labour makes driving diversity agendas challenging.



