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CISP Review Stage 1: Public Review

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1 Introduction

The purpose of this project is to evaluate the impact of Fletchers Collaborative Innovation Strategies Program (CISP) Stage 1 as well as provide recommendations for development of a proposed Stage 2 Co-innovation Program.

Fletchers have engaged with MLA in a Collaborative Innovation Program (CISP) over the past 3 years. One of the key outcomes of the program has been to develop and manage initiatives to build innovation capability within Fletchers business operations. In June 2018, MLA and Fletcher's agreed to progress to Stage 2 of the Collaborative Innovation Program. The design of this program is to be considered within this project and will consider the proposed activity areas within MLA's new Co-Innovation Program.

The new Co-Innovation Program will align with Fletchers business growth strategy. To establish strategic direction for the program, a joint Fletchers-MLA executive Steering Committee will be formed to match innovation activities with business and industry priorities.

A revised relationship management and innovation resource structure (i.e. different form Stage 1) for both Fletchers and MLA will need to be developed to manage the expanded program, and the role of the joint Fletchers/MLA Executive Steering Committee in providing strategic direction will be further defined.

A requirement of the program is to report on the outputs, outcomes and impacts to Fletchers and industry. Therefore, this project will include an independent evaluation to help measure the outputs, outcomes and impacts of the Stage 1 program, and build the case for investment in the new Co-Innovation Program.

This project is intended to support the assessment of the success of the Fletchers Collaborative Innovation Strategies Program (CISP) Stage 1 by quantifying the effectiveness of Fletchers Innovation Manager (IM), dedicated work groups in the specified innovation focus areas and the company as a whole in developing a platform for innovation across the company.

This project will gather evidence of the impact various activities initiated by the IM and specified innovation champions have had across the company including but not limited to the areas of operational performance, financial impact and skills and capability development to foster a culture of innovation.

2 Objectives

The objectives of the third-party independent review were initiated to evaluate the impacts of a Collaborative Innovation Strategies Program (CISP) for an Australian meat processing company. This was achieved through the following:

1. Identify the extent to which the plant has added value to the Australian value chain through the CISP program;
2. Provide insights on opportunity areas that could be further developed by the plant under the new Co-Innovation Program;
3. Identify areas of weaknesses in the Stage 1 program resulting in missed opportunity including recommendations on how to engage differently in the future for increased benefit to the plant and industry.
4. Report on the 3-year CISP program including:
    - Overall achievement against agreed innovation priorities,
    - Quantified benefits of the innovation program,
    - Key innovation systems implemented,
    - Methodologies used, and
    - Key innovation case studies and lessons learnt.

3 Methodology

Data was collected on the impact of innovation projects initiated across the company during a three year period.

Data sources included:

- Documentation - milestone reports, budgets, and innovation strategies
- Phone interview
- Site visit, including a full tour of the site and explanation of each innovation project. This approach allowed the reviewers to identify if and how the program created new value, and to collect a broad range of views to help ascertain other less obvious insights.
- Questionnaire

An analysis of benefits achieved was consequently conducted based on the information collected. This addressed tangible benefits (such as new processes, new resources, financial benefits and customer benefits), as well as non-tangible benefits (such as strategic alignment, project execution, innovation capability of people, and collaboration across the value chain).

The CISP review was guided and assessed against three lenses that are known to effectively solve business problems: feasibility, viability and desirability. David Kelly is the author of these widely used lenses and the founder of IDEO and the Stanford d.school (https://www.ideou.com/pages/design-thinking). If each of the lenses are thoroughly addressed a company will design successful innovations.

Figure 1. Innovation design lenses.

The CISP review of innovation projects are scored on a 1-5 scale for each of the three lenses.

Feasibility is a score of how functionally possible a specific innovation is to implement within the foreseeable future. A score of 1 means that the innovation was extremely difficult to implement. A score of 5 means that the project was easy to implement.

Viability is a score of the commercial viability of a specific innovation and whether it is likely to become part of a sustainable business model. A score of 1 means that the project is not commercially viable, whereas a score of 5 means that the project is highly commercial.

Desirability is a score of the relevance of the project to helping people. ‘People’ may be an external customer or end user, or people may be an internal user or stakeholder. A score of 1 means that the project was not at all helpful to people, whereas a score of 5 means that the innovation was very helpful to people.

The scoring of each project is based on the perceptions of the reviewers. These perceptions are validated by additional sources of evidence collected throughout the review process including interviews and documentation.

The **level of success** of each project is a combined score that accounts for the overall effectiveness of the innovation project. A score of 1 means that the project was not successful, whereas a score of 5 means that the project was very successful. Overall level of success scores are agreed by at least two reviewers. The level of success is a overall combination of all data sources collected across the review, including documentation, interview, site visit and questionnaire.

4 CISP Stage 1 Review

This section details all the non –confidential projects that were initiated under the CISP. These projects are grouped into the five categories identified by the plant as potential innovation opportunity areas. These are: 1) Supply chain development, 2) Food safety, 3) Operational efficiencies, 4) Livestock and feedlots, and 5) Environment. Figure 2 identifies the projects identified at the start of the program.

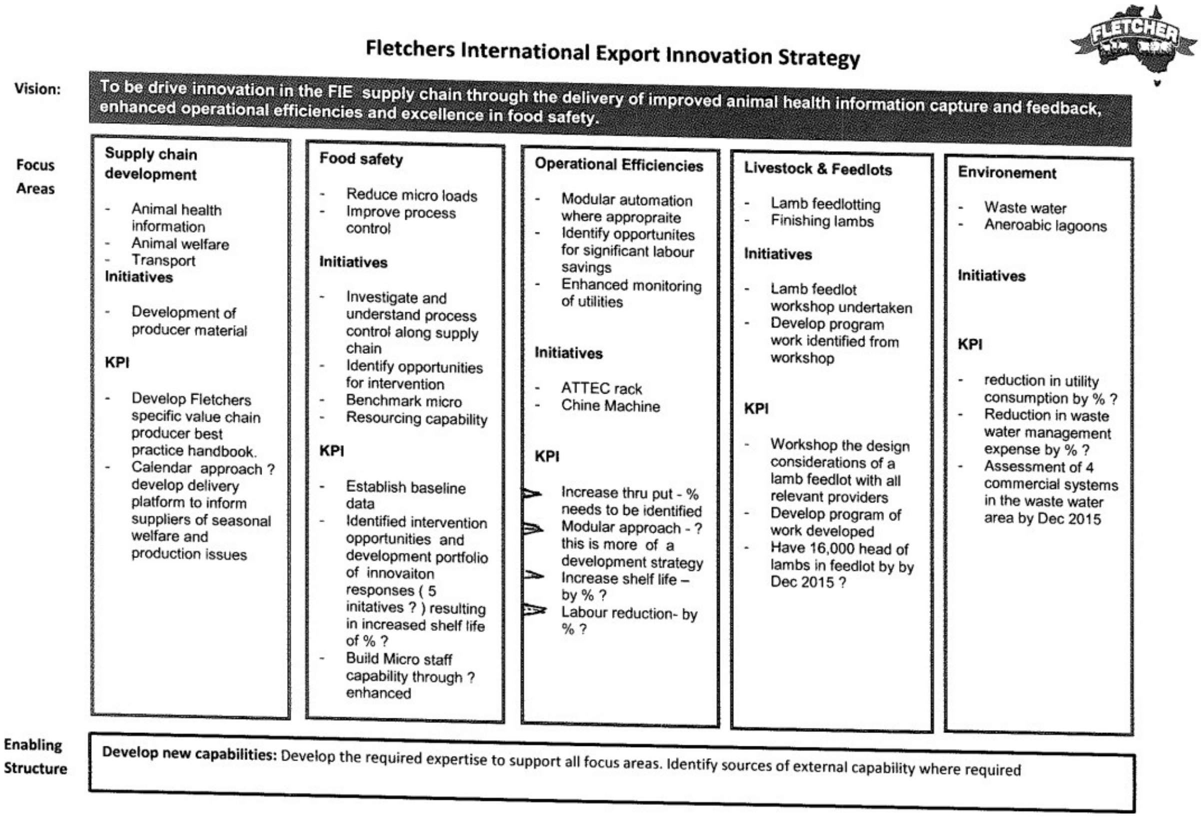

Figure 2: Fletchers innovation strategy completed at the commencement of the CISP program.

4.1 Supply chain development

4.1.1 Producer feedback

The business began its supply chain development strategy by providing feedback to its suppliers. As such, a digital animal health reporting system now sends producers automatic emails which detail the degrees to which varying animal defects exist. These defects include worm eggs, arthritis, bruising, caseous lymphadenitis, dog bites, Ovine Johne's Disease, pleurisy and pneumonia, rib fractures, seed, tapeworm and vaccination abscess. The intention of this project was for feedback services to help increase production rates and to foster better animal health. In the long term, it is intended that the level of disease in animals will reduce, providing increased income for both the producers and the processor.

4.1.2 Animal welfare

A higher level of animal welfare is expected to be a key factor in developing a resilient supply chain.

4.1.2.1 Continuous amperage stunning

Under the CISP, the plant implemented amperage stunning and discontinued voltage stunning. The benefit of this change for animal welfare is that amperage stunning does not cause the thrashing post slaughter that occurs with voltage stunning, and instead induces instantaneous insensibility. Note that reduction in carcass movement post-knocking also prevents carcasses from falling off the rail. As such, time and effort is no longer spent retrieving heavy fallen animals and attaching them to their hooks, thus unlocking some additional labour and OH&S benefits.

Figure 3 captures the stunning environment under the newly implemented method.

Figure 3: The new amperage stunning practice

4.1.3 Coproducts

Coproducts facilitate full carcase utilisation, which if well managed can add value to supply chains.

4.1.3.1 Hock and head dehairing

The plant identified hock and head dehairing as opportunities for extracting new value out of carcase coproducts. To this end, the plant researched several automated hock and head dehairing options. A trial hock dehairing machine was installed but was deemed unviable at this stage of its development. Similarly, no viable head dehairing technology was found.

4.1.4 DEXA

Dual Energy X-ray Absorptiometry (DEXA) technology uses two X-ray beams to objectively measure the lean meat, fat and bone content of carcases. Seeing the opportunity of the technology for processing efficiency and feedback capabilities, the plant identified DEXA as potentially beneficial to its relationships with both directions of the supply chain, as well as its bottom line. As such, DEXA installations in both NSW and WA plants were costed out, with quotes obtained for both installations. From this point, it was established that the value of the technology had been limited by two factors. Firstly, most of the plant's purchases are on-the-hoof rather than over-the-hook. Therefore, payment would typically be made prior to analysis by DEXA technology, thus limiting the plant's ability to make payments based on lean meat yield. Secondly, the high proportion of mutton (a lower value product) that goes through the plant limits the dollar value benefit of DEXA installation. However, despite these limitations, the plant is still considering installing the system for the purpose of obtaining the feedback that can inform future purchasing and processing decisions.

4.2 Food safety

4.2.1 Shelf life micromanagement report

In addition to monitoring shelf-life more closely, the plant sought to increase the average shelf-life of its products. To this end it underwent a comprehensive review and subsequent report of the entire business' processes, with the aim of investigating what could and could not be done to improve shelf life. The focus was generally placed upon improving hygiene processes; chemical opportunities such as plasma water were also discovered. The review was a success, enabling the plant to increase average shelf life by 30 days.

4.2.2 SARDI trials

From November 2017 to October 2018, the South Australian Research and Development Institute (SARDI) performed analysis based on microbiological and visual examinations on over 31,000 carcases that went through the WA plant. At the microbiological level, the total viable count (TVC) for each carcase was determined and the carcases were tested for E. coli. Tests for other common defects were performed at the visual level. The SARDI trials helped provide some key food safety metrics, facilitating a benchmark from which continuous improvement of food safety could occur.

4.3 Operational Efficiencies

4.3.1 Plastic pallets

Prior to this innovation, considerable manual labour was needed to unload cartons off pallets and into shipping containers. To increase operational efficiency, the plant invented a plastic pallet with indents in the top which would provide space between the middles of the cartons and the pallets themselves. A forklift could be inserted into this space, and from there, pick up a large stack of cartons and unload the whole stack directly into a shipping container. The new process would save labour hours and reduce OH&S risks that arise from manual removal of pallets. These benefits made the invention highly useful, even resulting in the plant winning an AMPC award for it. However, when confronted with the production cost of the pallets and patent infringement risks, the plant discontinued the project. Figure 4 shows an example of the pallets designed during the project.

Figure 4: Invention of smart plastic pallets

4.3.2 Automation

4.3.2.1 Rack, chine and flap removal machine

The plant made use of a significant MLA investment to install a Scott Technology machine that can process lamb racks more accurately than other chining machines available, with the addition of the rack and loin tail removal capabilities. Notably, the system operates at 12 pieces per minute for either racks or loins. Thus, the decision was made to only process racks through the system allowing the operator to maintain the speed of the room.

The automation of rack, chine and flap removal tends to enable very substantial increases in yield recovery from the chine bone, and a far more accurate rack tail length. Robust financial modelling from previous studies has estimated a $0.79/head benefit for chine removal, and a $0.18/head benefit for rack flap removal (Green and Bryan 2015) utilising the integrated middle machine. Under the CISP, the plant aimed to realise these benefits by installing a machine in NSW, marking the first standalone installation in Australia.

Note that there are differences in labour requirements and throughput benefits between the standalone machine and the integrated middle machine. The standalone machine requires manual rack-loin separation, whereas the integrated machine does not. Also note that the integrated machine is able to handle 10 carcases per minute, whilst also adding additional value for all of those carcases. Nevertheless, the accuracy and yield benefit remains similar between these two different configurations.

Due to the large average size of the carcases that were being processed in NSW, carcases were getting stuck on entry into the machine. As a result, the system was relocated to WA where it is currently being trialled. It is expected that the system will be able to operate effectively in WA due to the smaller average carcase size.

Figure 5 shows two images of the standalone version of the machine in NSW.

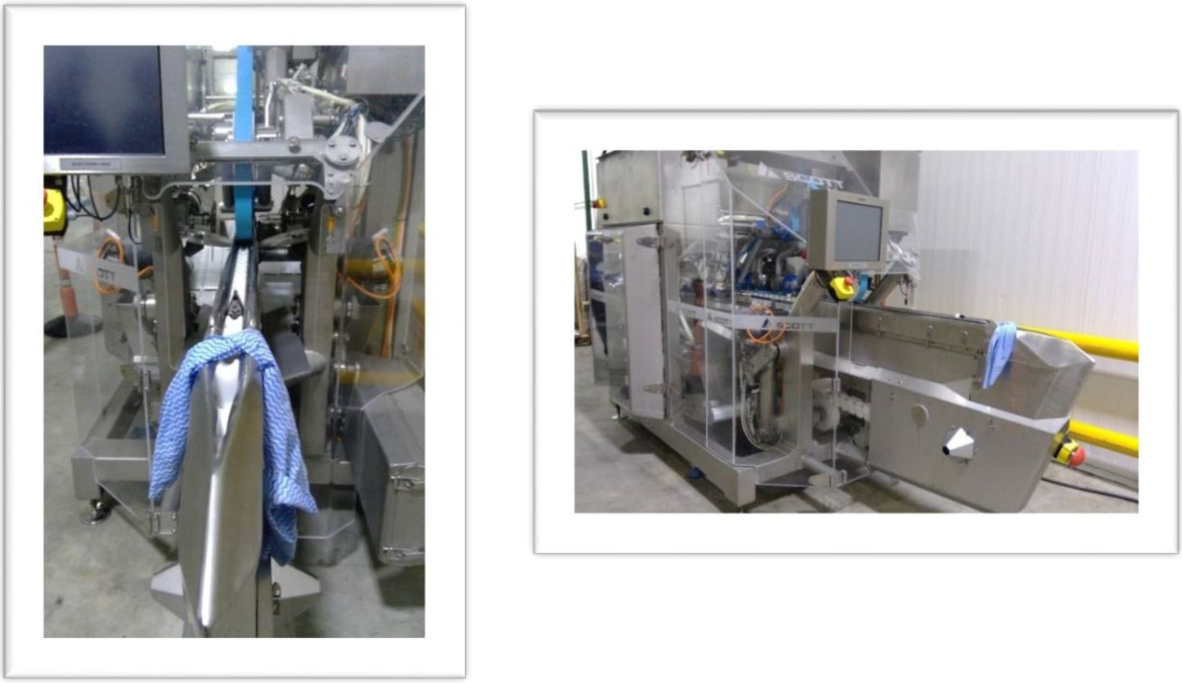

Figure 5: Standalone NSW machine for rack processing

4.4 Livestock and Feedlots

4.4.1 Feedlot

As part of the plant's procurement strategy, a new lamb feedlot was constructed in NSW. The feedlot is currently in operation, successfully increasing the weight and condition of animals prior to processing. Understandably, the construction of the feedlot itself is not part of the CISP, because it was closely linked to larger business strategy. However, within this development, there were certain opportunities for R&D that could have been considered for the CISP.

4.5 Environment

4.5.1 Boilers

Under the CISP, the plant changed from LPG-fuelled boilers to waste-oil-fuelled boilers, then finally opted for woodchip-fuelled boilers, due to several significant incentives. Woodchip fuel is a renewable energy source that was in high supply in the area, at low cost. Meanwhile, the cost of waste oil and LPG fuel was on an upward trajectory.

5 CISP Stage 1 Summary Findings

This section presents the CISP findings, including results on the project areas, the overall success of projects and the feasibility, viability and desirability of each project.

5.1 Project completed in each focus area

The review found that there was a significant difference between what was originally planned in the innovation strategy, compared with what was executed. Operational efficiency projects became the core focus of the CISP. Environmental and livestock projects gained limited traction because of the emphasis on operations.

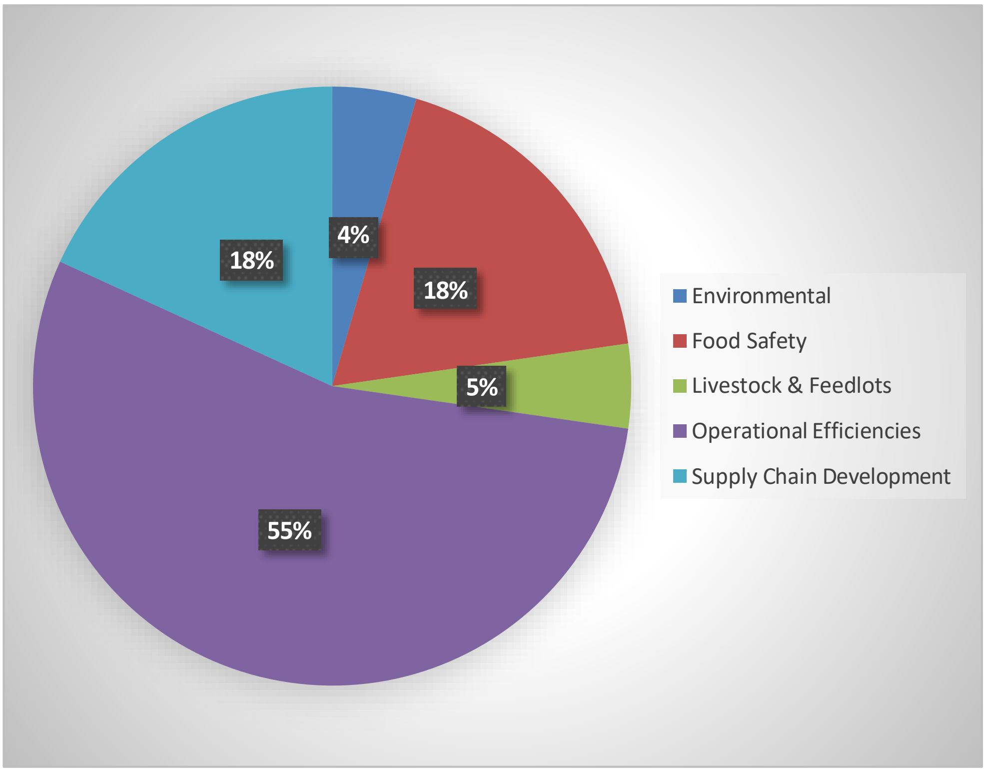

Figure 6: Percentage of projects compared to the 5 focus areas identified at the start of the CISP.

5.2 Project Outcomes

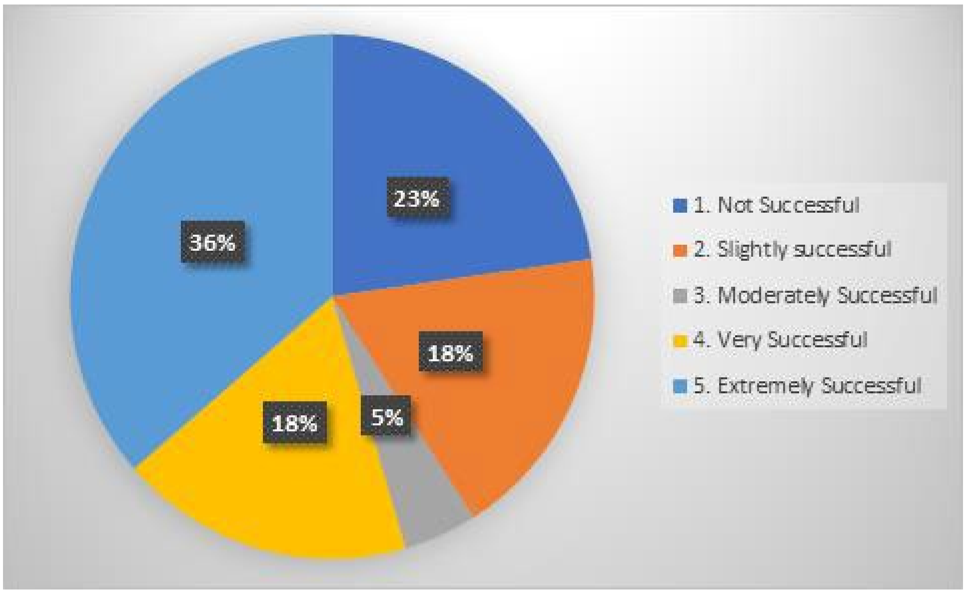

Figure 7: Innovation project success.

Analysis of the 22 projects found that 55% of projects were very or extremely successful, with 23% being unsuccessful. Many of the unsuccessful projects were terminated during the CISP.

5.3 Feasibility, viability and desirability review

Using the framework described in the methodology section, each project has been assessed.

Analyses each project according to focus area and 4 key metrics:

- *Focus area: whether the project was operationally-focussed, consumer focused, customer focused, or producer focused*
- *Level of success: how successful the project was relative to how successful it could have been and an overall result based on all data collected during the review*
- *Desirable: the extent to which the project benefits the end user*
- *Feasible: the extent to which the innovation was easy to implement*
- *Viable: the level of financial net benefit to be provided by the innovation*

Analysis of the above 22 projects can be further summarised by three characteristics.

Firstly, the CISP had a highly **operational** focus with 55% of the projects initiated in this area. Most innovations that were implemented under the CISP related to improving the actual processing and movement of animals.

The main benefit of this approach is that it fosters efficiency. For example, establishing an automated hide puller produces labour savings and enables the plant to process more product through the plant. Undoubtedly, the innovations developed in the operational area of the business have generally been very successful.

However, the main risk of this approach is that it may not do enough to grow the demand or supply for product long term. When a plant has a more operational focus, it may eventually find itself placing too much emphasis on finding and recovering lost value from within the plant and overlooking the need to draw in new value from outside the plant, namely from consumers and producers.

Secondly, the CISP was highly modular. In practice, this meant that over the course of the CISP, the plant created new value through isolated and periodic operational improvements. In

There is limited evidence of strategic planning that touches multiple areas simultaneously. The main exception to the modular approach was the development of software to track and monitor livestock and carcases from vendor property to boning. The modular approach can enable stability in the plant by allowing staff time to adjust to the new innovations, and by maintaining the sense of routine that encourages precision and high throughput rates. However, the modular approach is at the expense of coordinated business strategy and economies of scale. A *whole-of-business approach* is far more strategic than a modular approach, and focuses on the long-term goals of the businesses, bearing in mind relationships with producers, customers and consumers. Are the innovations being implemented aligned with what the business is wanting to achieve in the long term? Are they the best use of the business' time and capital? What is the best way to sequence the implementation of these innovations? And most importantly, what if the business is missing out on a very large area of opportunity, and needs to be reoriented in order to exploit it? A modular approach may not always ask these questions.

Thirdly, the CISP tended to take a trial and error approach. As such, there was a relatively short period of analysis as to the desirability, viability and feasibility of proposed innovations. In

, scores for desirability, feasibility and viability are positively correlated with the overall success of each project. Instead of evaluating projects against these metrics, the plant would often pay for and implement innovations more quickly, and then simply remove the innovation if it finds it is not working well for the business. A trial and error approach is high-risk and high-reward. If the innovation is a success, the business quickly enjoys the benefits (as seen with e.g.: the gusset liner applicators). However, if the innovation is a failure, the business has wasted its resources. Thus, if the business is risk-averse, it may consider measuring projects for desirability, feasibility and viability which will be discussed in *Section 6: Making Innovation More Profitable.*

6 Making Innovation More Profitable

Innovation is fruitless if does not contribute to a business' bottom line. Accordingly, the conclusions from the previous section have informed three recommendations to help the plant to increase the profitability of its innovation projects: 1) Grow supply and demand, 2) Build a comprehensive innovation strategy, and 3) Evaluate desirability, viability and feasibility.

6.1 Build a Comprehensive Innovation Strategy

A whole-of-business innovation strategy keeps in mind the interconnected nature of all elements of a business rather than viewing each element in isolation. While this can require a substantial commitment to innovation by many members of the business, it can enable the business to organise and sequence its innovation pipeline in accordance with profitability for the whole business. Investment and resources can be shifted towards priority value areas. Most importantly, entirely new areas of value can be identified when many colleagues come together to look critically at the business.

A successful innovation strategy can be developed using the double-diamond process (11) whereby high-quality solutions are generated through a four-step process of diverging and converging:

Discovery: gaining broad insight into the plant's holistic innovation problem space

Define: establishing the specific areas to focus on

Develop: broadening to generate as many potential solutions as possible

Deliver: narrowing down to a business strategy that is appropriate for the plant's holistic context

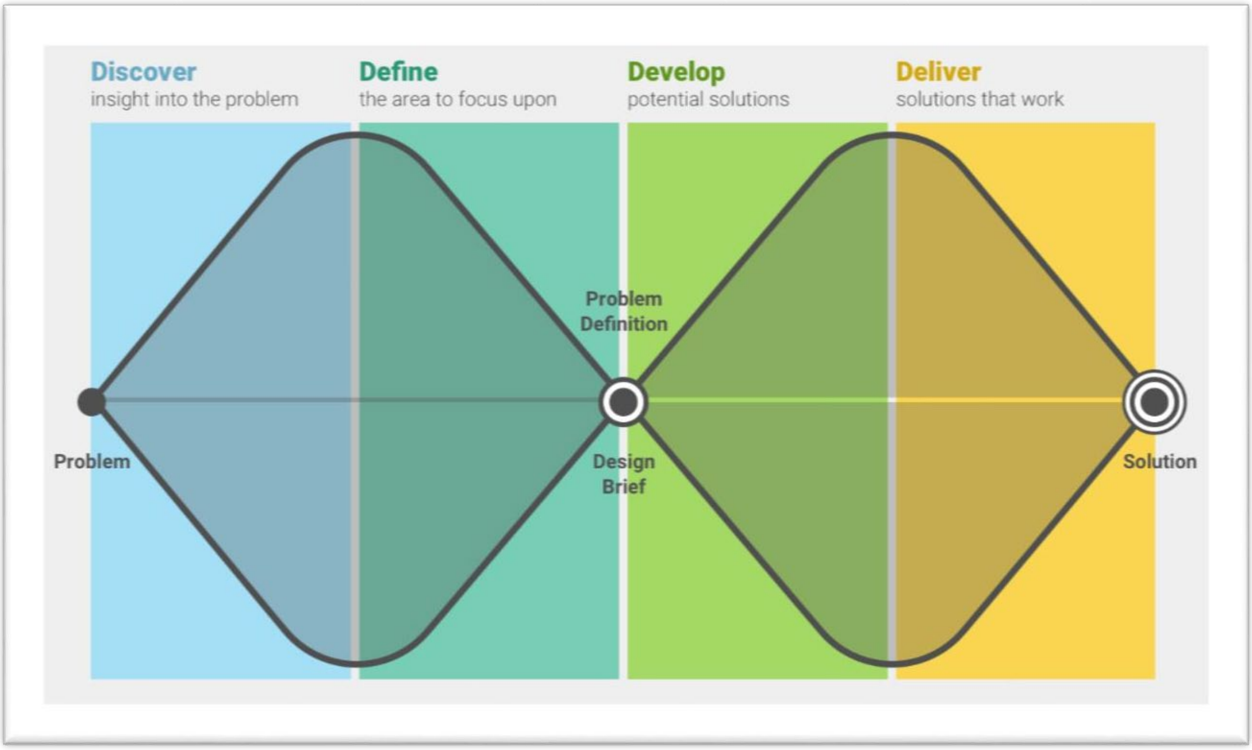

Figure 8: The double diamond process

This four-step process may involve innovation sprints (described in Figure 9), surveys with key stakeholders, workshopping strategies with teams, extensive market research, and other design-led undertakings.

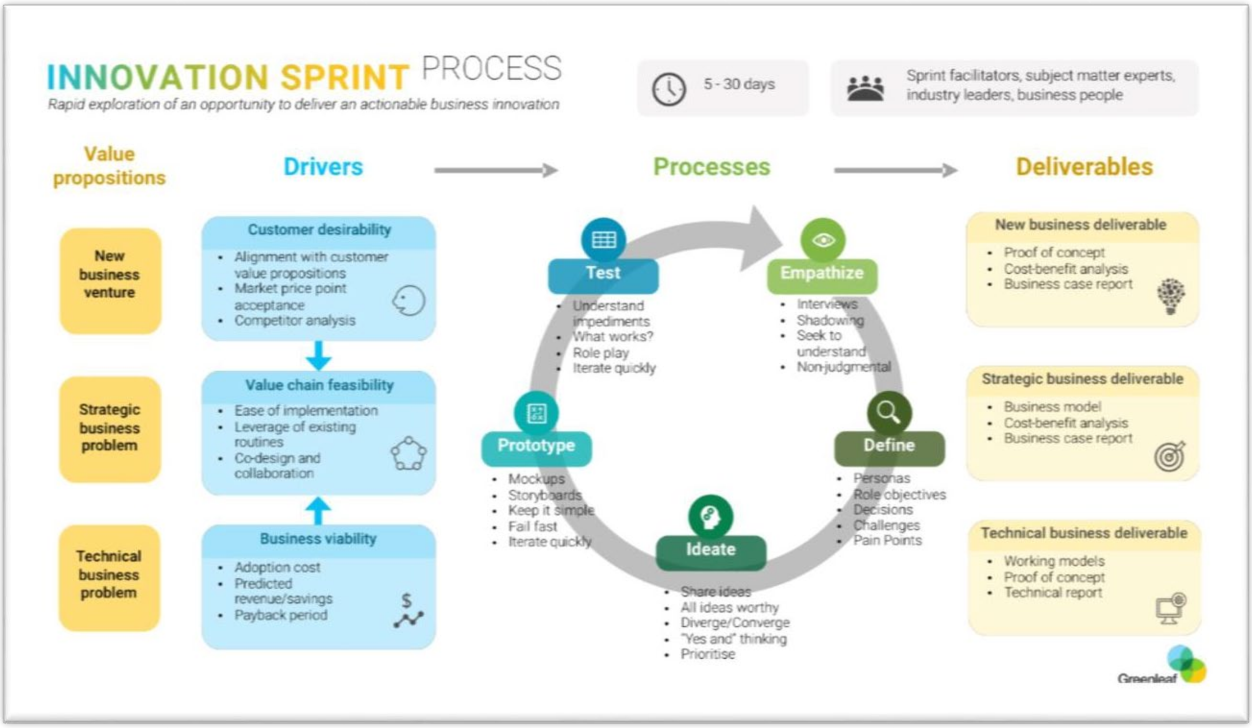

Figure 9: The innovation sprint process

6.2 Evaluate Desirability, Feasibility and Viability

The framework used throughout this review is an alternative to the trial and error approach. All innovations should be measured for desirability, feasibility and viability before the plant expends resources implementing them.

One example where this framework would have been applicable is the plastic pallet invention. The highly innovative pallets invented by the plant were desirable. Nevertheless, they did not come to full fruition due to lack of viability (high production costs) and, as the project progressed, feasibility was a problem (patent infringement problems).

On a positive note, wood chip boilers are feasible (ample nearby fuel supply), viable (low relative cost) and desirable (woodchip fuel is a sustainable energy source). The plant was also able to recognise that informative soaker pads would have been desirable, and potentially viable, but were not feasible at the time, and hence put the project on hold.

7 Key Recommendation

The CISP presented great opportunity for the plant. The opportunities developed in the operational area of the business have been very successful. However, the full CISP opportunity has not been realised due to the operational focus of staff involved.

The plant needs to increase the capability of its staff to successfully implement the CISP. To this end it is recommended that the plant **engages an innovation working group with diverse capabilities stretching across the value chain.** This working group should be championed by senior managers and should be led by the future innovation manager.

This working group should also establish a **system for identifying and prioritising potential projects against key metrics.** The system should plan and track innovations through the pipeline, proposal, prototyping, and commercial stages and should also facilitate detailed performance reporting.

8 References

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