



final report

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John Dee Collaborative Innovation Strategies Partnership program Stage 1

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Abstract

The purpose of this project was the development and implementation of a Stage 1 Collaborative Innovation Strategy between John Dee Warwick and Meat and Livestock Australia. The John Dee innovation priorities were integrated into the company's overall business strategy and included measurable performance indicators which identify the contribution of innovation to the bottom line and achievement of key business objectives. Ultimately, the innovation strategy contributes to John Dee's long-term profitability, competitiveness and sustainability. The scope of the innovation strategy included initiatives in the key business areas of:

- Operational efficiency (with a specific focus on materials handling)
- Innovation resource planning and people development
- Sustainability (Environment)
- Feedlot/livestock
- Supply chain innovation (including areas such as eating quality; information management; supply chain alignment; through chain assurance)
- Marketing/product innovation - including integration between CISP and Co-marketing programs as appropriate (separate contractual arrangements are in place for the Co-marketing program)

The timeframe for development and implementation of the Stage 1 Collaborative Innovation Strategy was three years, although agreed innovation and R&D projects may be implemented and supported to address short, medium and long term time horizons outside of this three-year period. Throughout the collaborative program, a range of strategy development and implementation activities were executed including (but not limited to):

- Documentation of key objectives and innovation initiatives in each of the above key business areas
- Quantifiable innovation performance targets in each of the key business areas, including the development of baselines and measurement systems to monitor progress
- Development of an innovation skills and resources plan to build John Dee's capability to effectively implement the innovation strategies
- Initiatives to support the cultural change required across the business to deliver against innovation objectives

It is noted that where external expertise is required to undertake any of the above activities, these will be treated as separate projects and will be contracted under individual schedules in the same way that other innovation/R&D projects are.

The John Dee/MLA Collaborative Innovation Strategy program was linked to the outcomes of the John Dee CISP Stage 1 program and John Dee Innovation Manager with coverage of the following projects:

- P.PIP.0384 – John Dee CISP Innovation Manager
- P.PIP.5003 – John Dee Collaborative Innovation Strategies Partnership program Stage 1

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1 Background

1.1 Australian Red Meat Industry: Key drivers

Process optimisation and innovation are critical in the Australian red meat processing industry.

The key drivers for adoption of new technologies and ideas in the Australian Red Meat Industry include:

- Labour reduction. Automation is critical to realise benefits through
 - Reduced processing costs without dependence on unattainable high manning levels
 - Minimising opportunity costs of redirecting labour from value adding
 - Activities to low value tasks that are critical for continuous operations
- Yield improvement. Tight margins mean meat processing can only remain competitive via processing efficiencies that improve yield.
- OH&S. Removing tasks that cause strain and injuries will reduce accident claims and attract a wider pool of workers.
- High food safety standards are key to access markets and compete with other foods.

1.2 John Dee Warwick – The Company

John Dee Warwick is a family owned and operated beef production business spanning over four generations of experience in producing and selling premium quality Australian beef primarily to export markets. The business was established by Mr Frank Hart in 1939 as the Australian meat exporting company, John Dee Pty Ltd, and today his sons, Henry, Frank, John, Barry and Robert still own and operate the Company. When export beef production started at Warwick in 1957, John Dee began the long tradition of total hygiene, strict quality control measures and fresh production. Consistent monitoring of standards are maintained by the Australian Quarantine Inspection Service (AQIS), the Authority for Uniform Specification for Meat and livestock (AUS-MEAT), and by John Dee's own in-house quality assurance monitoring. John Dee regards the preparation of meat for export as a vital responsibility and is committed to maintaining high standards of hygiene and health.

The business consists of the following operations:

- Beef export processing facility located in Warwick (opened and operated since 1947) with production capability of 120,000 cattle processed per year.
- Yarranbrook feedlot located at Inglewood Qld (20,000 head capacity)
- John Dee's beef trading offices in Brisbane, Australia and Tokyo with export markets of prime Australian beef product to Japan, Korea, China, UK, Europe, Taiwan, Hong Kong and North America.

1.3 Collaborative Innovation Strategies Program

In September 2007, Meat & Livestock Australia (MLA) launched the Collaborative Innovation Strategies program (CISP). The program involves the co-development of comprehensive innovation strategies with individual enterprises which meet commercial imperatives in addition to focusing on the implementation of key industry and government innovation priorities. The CISP is a flexible enterprise innovation capability building program that is customised for large and small enterprises throughout the red meat value chain. Enterprise

innovation capability within the context of this program is defined as the underlying capacities that enable a firm to be innovative on a sustained basis, rather than producing one-off product innovations from time to time.

Using a structured and collaborative process, MLA will partner with John Dee to develop a customised strategic innovation capability building program for a three to five year duration. The program can encompass the entire business (whole-of-enterprise program) or alternatively remain focused on a specific business area in which you identify a need to develop innovation capability (focussed program). The partner company can appoint an internal innovation manager, and/or can develop multiple resources to implement and sustain innovation initiatives.

To be effective, the CISP will be aligned and integrated with your company's overall corporate strategy and will be integral in enabling your company to successfully achieve its business objectives.

1.4 Innovation Manager

The Collaborative Innovation Strategy program was overseen by a joint John Dee/MLA Steering Group and implementation was managed by a team of John Dee/MLA Innovation Managers (with additional internal and external resources as required). This project provided support for equivalent to one full-time John Dee Innovation Manager including two additional innovation support resources (considered necessary to support the volume and complexity of R&D/innovation projects expected within Stage 1 of the program). It is noted that John Dee may appoint other innovation resources as the program evolves, although these are unlikely to be full-time Innovation Managers.

The primary focus of the John Dee Innovation Manager role is the implementation of the agreed John Dee/MLA Innovation Strategy across the John Dee business. It is anticipated that Innovation Manager and additional resources will focus particularly on John Dee's business priorities and will also co-ordinate the operational efficiencies and environmental sustainability areas of the Innovation Strategy.

The major activities to be undertaken by the John Dee Innovation Manager included:

- Participate in the development of a comprehensive John Dee Innovation Strategy across the key business areas identified above.
- Assist in developing and monitoring key performance indicators and other measures of impact as agreed.
- Instigate innovation idea generation and filtering and feedback processes with a specific focus on operational efficiency and processing technologies.
- Develop and co-ordinate an agreed suite of R&D/ innovation projects.
- Manage and monitor the John Dee spread-sheet to manage expenditure and track benefits from outcomes generated from John Dee R &D/innovation projects and activities.
- Participate in the development and implementation of a John Dee innovation skills and resources plan.
- Support and coordination of site project teams.
- Participate in the development and implementation of cultural change initiatives required across the business to deliver against innovation objectives.
- External relationship management with research partners, research providers, equipment suppliers, processing sector and value adding sector as appropriate.

- Active participation in the MLA Innovation Managers Network.
- Participate in other innovation skills development activities as agreed.
- Prepare regular project reports and quarterly innovation reports.
- Participate and/or facilitate in independent cost benefit analyses as required.
- Assist in the preparation of the annual Innovation Health Check report.

Ongoing support for this role by MLA was contingent upon:

- There is clear evidence that the role is a dedicated full-time Innovation Manager role.
- The joint John Dee/MLA Steering Group is satisfied with progress and agrees to continue the program at each of the annual go/no go decision points.
- The Innovation Manager satisfactorily undertaken the full range of activities as described above (or as varied and agreed by John Dee and MLA).

In addition to individual project reports as required, the John Dee Innovation Manager will provide a quarterly report detailing the following:

1. Summary of progress of all R&D/innovation projects underway.
2. Update on each of the broad areas of focus within the overall John Dee Innovation Strategy.
3. Details of baselines, measurement systems and progress regarding key performance indicators related to the key business objectives detailed above.
4. Specific details on change management initiatives underway.
5. Specific details on implementation of Innovation Strategy in relation to Operational Efficiency and new Processing Technologies across the business (specifically materials handling program and environmental sustainability initiatives).
6. Activities proposed for next quarter.
7. A final report will be provided at the conclusion of the program detailing overall progress against agreed goals and benefits of the program to John Dee.

In addition, the John Dee Innovation Manager will contribute to the annual Innovation Health Check Report which will be jointly prepared by John Dee and MLA for consideration by the joint John Dee/MLA Steering Group (and will be the basis for the go/no go decision each year).

2 Objectives & Key Measures of Success

The contribution of the John Dee Innovation Manager to the overall success of the Innovation Strategy was determined by:

- Evidence of effective implementation of John Dee innovation strategy in agreed areas
- Evidence of improvement in company innovation culture and capability
- Quantifiable improvements in company innovation measures (as agreed)
- Efficient project delivery in accordance with budgets and timelines
- Quality of reports
- Contribution to Innovation Managers Network

3 Key Focus Areas

3.1 Innovation Strategy (John Dee CISP Stage 1)

The primary focus of the CISP program is an innovation strategy which, when developed, will be integrated into the company's overall business strategy including measurable performance indicators to identify the contribution of innovation to the John Dee's bottom line and achievement of key business objectives (Refer to Figure 1).

Specific areas and company priorities were identified through initial discussions involving senior management in John Dee operations, environment and engineers with MLA technical managers and Innovation Managers. The agreed areas of focus in developing innovation capability identified in these initial discussions were environmental sustainability (ie water, energy and waste management) and operational efficiencies specifically but not limited to Materials Handling. Other areas were identified through ongoing facilitated processes. Strategic documents in these priority areas are under development.

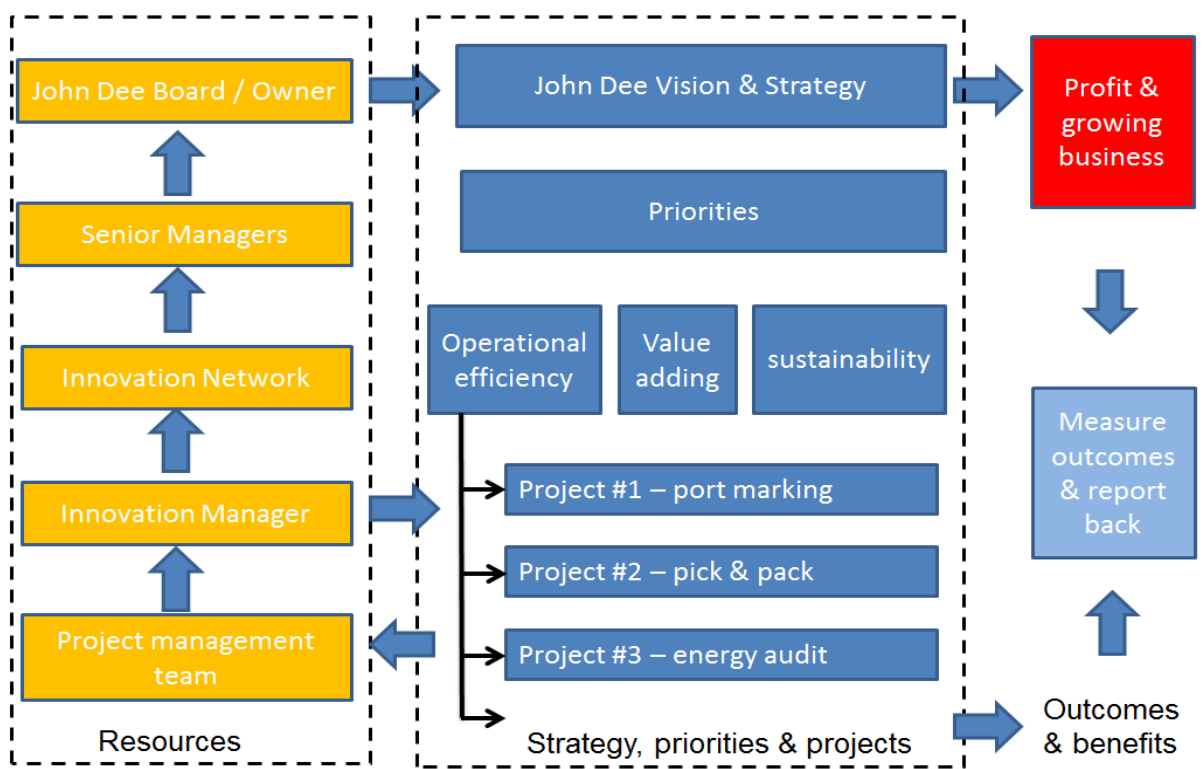


Figure 1: Building John Dee's people skills and capability to deliver agreed priorities and profitability including Material Handling Solutions.

The scope of the innovation strategy will be quite broad and may include (but not be limited to) initiatives initially in the areas of:

- Environmental sustainability (ie water, energy and waste management) and
- Operational efficiencies specifically but not limited to Material Handling.
- Boning remove efficiencies
- Developing information intelligence to support technological developments and advancements
- Developing people skills and capability to support technological developments and advancements

John Dee has done substantive background work and planning in Materials Handling and has identified this as their primary area of need. Other areas were identified through ongoing facilitated processes and strategic discovery study tour exercises. John Dee developed an innovation resources plan (piloted with Well Grounded). A proposed partnership project between Greenleaf & MLA has been completed to facilitate long-term capability in use of CBAs and inform John Dee's CISP priorities.

3.2 John Dee CISP – Key focus area is developing capability in Materials Handling

John Dee had done substantive background work and planning in materials handling during the three-year CISP program. The following business related issues have been identified: i) Sales requirements call for increased assembly of mixed products, ii) Storing products and calling on oldest first items is a labor intensive task, iii) Products requiring immediate shipping need to be fast tracked to eliminate double handling, iv) OH&S issues with manual handling, and v) Labor intensive.

The proposed solution was to automate the palletising, temporary storage and retrieval of cartons into and from a short-term holding chiller. Also proposed to re-introduce product into existing facilities in an organised sequence ready for container loading or automated palletising for storage.

Tentatively a number of priority areas identified, but not limited, to operational efficiencies to be gained in the following strategic areas:

- i) Optimal semi- and/or automated de-palletisation and container loading
- ii) Verification of product processes (ie review of current port-marking and tracking product).
- iii) Product sortation (Pre-sorting product).
- iv) Review of dunnage materials integrity and reliability during container transport.
- v) Automation of information (ie information management) – integration of information for optimal processing efficiencies (ie modelling of information using current production including product flow and mix).
- vi) Value proposition, scoping and feasibility study to be independently developed for materials handling program including independent recommendations.

In this strategy, the goal was to automate the palletising, temporary storage and retrieval of cartons into and from a short-term holding chiller. Also, the purpose was to re-introduce product into existing facilities in an organised sequence ready for container loading or automated palletising for storage. John Dee recognised that customisation is critical for future prosperity. With increasing customised ordering comes high levels of complexity. This strategy also addresses the required skills and capability, information intelligence and systems required in such a comprehensive and sophisticated material handling system.

Tentatively a number of priority areas have been identified, but not limited, to operational efficiencies to be gained in the following strategic materials handling areas:

- i) Semi or fully-automated de-palletising & container loading.
- ii) Verification systems - Investigation of port marking options.
- iii) Sortation - hardware to convey, check, mark & reject/ diversion mechanisms.
- iv) Dunnage - dunnage materials integrity and reliability during container transport.

v) Information management including mapping software / IT requirements.

A Materials Handling Vision and Strategy document including a draft plan to sort as high-medium-low priority projects & roadmap of R&D projects was developed to identify highest priority areas initially to be piloted as:

1. Diverter - picks out shortlisted products for pre-sorting area.
2. Robot – stacks and un-stacks, sorts and delivers cartons at a controlled rate for container loading or auto palletising.
3. Divert 2. Directs cartons to container or palletising machine or auto/manual stack down.
4. Load check and port mark applicator
5. Container loading equipment to be developed to automate the process.

All critical technological components were proposed to be piloted in a pre-production configuration that will be setup in the plant. This pre-production pilot facility was used to evaluate all critical components in material handling.

The overall outcomes of the project were:

- 1) Materials Handling solutions to address(pallet storage to carton dispatch)
 - Automation of information – integration of information for optimal processing efficiencies
 - Optimal semi-and/or automated palletisation & de-palletisation processes
 - Value proposition, scoping and feasibility study to be developed for cold stores & materials handling program opportunity to have independent review and recommendations
 - Modelling of information using in current production including product flow and mix.
- 2) Skills, capability, capacity & information intelligence recognised as critical in development of a comprehensive and sophisticated material handling systems. This proposal will also address the required skills and capability, information intelligence and systems required in such a comprehensive and sophisticated Material Handling system.

This research is the initial stage (Stage 1) of a feasibility and pilot study of operational efficiencies in Materials Handling from product cartoning, portmarking and tracking, palletising and containerisation. A number of critical processing parameters were evaluated using a pre-production pilot plant facility on site.

3.3 John Dee CISP – Other Key focus area

In addition to materials handling initiatives, throughout the project the general focus areas that were also under consideration as R&D included:

- Order picking optimisation
- Controlled checking export product
- John Dee product labelling & authentication
- Nutrient recovery
- John Dee interventions to address future challenges with carbon tax
- By-product utilisation
- Waste management - anaerobic lagoons
- John Dee water savings initiatives
- John Dee energy savings (Phase 2)

- IT framework for sales & marketing forecasting
- Beef Sani-vac
- Modelling of information using in current production including product flow and mix
- Knife sharpening management

4 Key Achievements & Outcomes

4.1 Innovation Strategy & Priorities

The primary focus of the project has been developing a projects tracking management system. Innovation team and work groups are starting to form to manage the R&D priorities. The key focus of the John Dee CISP in the initial stages will be materials / products handling. The materials / products handling strategy was developed.

Potential areas for John Dee to collaborate with MLA as PIP Projects (refer to John Dee Collaborative Projects spreadsheet last updated 23 February 2013).

Key focus areas were :

- Automation of information – integration of information for optimal processing efficiencies
- Optimal semi-and/or automated de-palletisation processes
- Value proposition, scoping and feasibility study to be independently developed for materials handling program including independent recommendations
- Review of current port-marking and tracking product.
- Review of dunnage materials integrity and reliability during container transport.
- Modelling of information using in current production including product flow and mix.

The outcome of the project has been a successful demonstration of an efficient and cost-effective method based on a pre-production prototype concept for container loading using simplified rapid prototype methods. The project was designed as a demonstration of how to build skills and capabilities within the company and specifically the program engineering group to be applied cost effectively on future materials handling initiatives.

4.2 Innovation Processes & Management

Since the commencement of the program in August 2013, significant progress had been achieved in the development and implementation of John Dee's Collaborative Innovation Strategy Program including:

- An internal John Dee Innovation Manager was assigned to the program.
- Identification of the preliminary John Dee innovation focus areas and priorities.
- Commence development of key roles and responsibilities required to drive innovation priorities including the Innovation Manager.
- Manage existing collaborative R&D projects (P.PIP.0370, P.PIP.0353, P.PIP.0384 & P.PIP.0444).
- Developed and implemented a R&D project priority management system to be used to communicate across the internal and external work groups.
- Development of John Dee's materials handling strategy.
- Review and provide technical input into new R&D proposals monitored through John Dee R&D project spreadsheet.
- Review options to evaluate and quantify the benefits of John Dee projects in the future.

- Innovation Manager participated in internal & external networks to accelerate outcomes for John Dee.
- Innovation Manager developed a learning and development plan and attended an innovation leadership course(s).
- John Dee's Innovation Manager involved in technical review and an active member of technical committees including AMPC. Specific interest and oversight into the active AMPC container loading project (a.tec.0102 - AGV container loading project).
- John Dee initiating a feasibility and pilot study of operational efficiencies in Materials Handling from product cartoning, portmarking and tracking, palletising and containerisation.
 - i) Investigation of port marking options.
 - ii) Map out software requirements.
 - iii) Discuss and plan proposals for hardware to convey, check, mark & reject mechanisms.
 - iv) Investigate suitable conveying and diversion systems.
- Development of John Dee's Innovation strategy through facilitated ongoing sessions in 2014-2016 to formalise the 3-year CISP priorities, with a specific focus on the development of John Dee materials handling strategy.

Overall John Dee has made significant progress in development of R&D process developments & systems. A number of R&D opportunities have been identified and implemented to enhance John Dee's capability. Specifically, key focus areas are more formal structure around managing current and new project concepts within John Dee and with external providers.

4.3 Ideas Generation & Setting Priorities - Global Scanning Exercises

A series of discovery exercises were conducted throughout the three-year collaborative innovation program in order to review latest global developments in beef processing technologies.

John Dee's John Hart participated in the syndicated study tour program involving several Australian Red Meat companies in May 2013. The study program commenced in Frankfurt, Germany to examine technologies both under development and/or applied on plants to address processing efficiency, yield and labour challenges. At the conclusion of the IFFA program, there were various plant and supplier visits undertaken in Paris and Netherlands. The outcome of the discovery exercise was a collective report (p.pip.0370) which was published on the MLA website. A second follow up industry study tour of IFFA including global technology scanning was undertaken in 2016 (project P.PIP.0518).

These study tours allowed focus on the following key questions:

- What new technologies are under development that directly relate to current gaps in the Australian approach specifically John Dee's material handling priorities ?
- What technologies or approaches might apply to further R&D and priorities for John Dee?
- What is the focus and strategy of technology providers and processors in the EU and other countries? How can this inform the Australian R&D priorities ?
- What learnings can be gained from comparing these approaches to the approaches in Australia, what are the gaps and what information do we need to upgrade the current information on these activities for processors in Australia?

Specifically the study program objectives were:

- Learn about the approaches being taken by processors in the EU and by technology providers for the development of slaughter, boning, vision and sensing and cutting and technologies;
- Examine new beef technological advances and critique these in relation to opportunities for Australian processors;
- See how new technologies are being implemented by processors in the EU;
- Understand the capabilities available and emerging;
- Identify priorities that can contribute to priority (consolidated) focus areas;
- Investigate and report on a specific issue/area of choice in relation to Australian processing conditions and requirements.

The overall purpose of undertaking the international tour was to compare technologies and see if other systems may affect direction of decisions made in relation to materials handling project.

Primary focus areas identified from the study tours for John Dee were beef boning, materials handling and load out logistics. The general focus areas for John Dee included:

- Lifting system (dock & container load out and various processing operations)
- Automated guided vehicle (container load out)
- Knife sharpening (semi and fully automated options)
- Optimal slaughter and boning floor technologies (NAWI)
- Manual assist including intelligent assist devices
- Naked block freezing
- Beef boning
- Cleaning and hygiene products
- Vision or Sensing technologies
- Grading and objective measurement technologies
- Cold storage, chilling & freezing technologies
- Sorting or Packing technologies
- Traceability and identification technologies
- Alternative cutting technologies
- Contamination detection and sterilisation
- Chemical Lean (CL) trim management systems (Marel)
- Sortation and auto-stacking technologies
- Inventory management
- Vision or Sensing technologies (cut identification through image analysis of cartons)
- Plant information and decision support systems

As a result of these study tours, John Dee is now subsequently engaged with several international companies as a direct result of the study tour program with interest in a range of beef slaughtering and boning processing technologies. Opportunity exists for companies to participate in collaborative efforts in areas of mutual benefit and John Dee would be interested to undertake syndicated R&D for specific industry beneficial initiatives.

5 Conclusions

The purpose of this project was the development and implementation of a Stage 1 Collaborative Innovation Strategy between John Dee Warwick and Meat and Livestock Australia. The John Dee innovation priorities were integrated into the company's overall business strategy and included measurable performance indicators which identify the contribution of innovation to the bottom line and achievement of key business objectives.

Throughout the collaborative program, a range of strategy development and implementation activities were executed including (but not limited to):

- Documentation of key objectives and innovation initiatives in each of the above key business areas
- Quantifiable innovation performance targets in each of the key business areas, including the development of baselines and measurement systems to monitor progress
- Development of an innovation skills and resources plan to build John Dee's capability to effectively implement the innovation strategies
- Initiatives to support the cultural change required across the business to deliver against innovation objectives

Overall John Dee has made significant progress in development of R&D process developments & systems. A number of R&D opportunities have been identified and implemented to enhance John Dee's capability. Specifically, key focus areas are more formal structure around managing current and new project concepts within John Dee and with external providers.

6 Recommendations and next steps

The following are the recommendations and proposed next steps:

- John Dee's is reviewing the option of partnering with MLA in a Stage 2 CISP project specifically on a "whole of program" approach to materials handling rather than individual projects leading to transformational changes.
- A proposed partnership project between Greenleaf & MLA submitted for approval to facilitate long-term capability in use of CBAs and inform John Dee's CISP priorities.
- An initiative is underway now to develop an impact and benefits portfolio of all John Dee R&D and program initiatives completed or currently underway. The benefits & impacts analysis will be used to report to John Dee to promote the CISP program and drive future improvement initiatives.