SNAPSHOT

ROADMAP DEVELOPMENT FOR A MEAT PROCESSING INTELLIGENT AUTOMATION CENTRE

Project Report Reference: 2018-1025   **Date: 14 December 2018**

Project Description

This project was undertaken to develop a roadmap for the use of intelligent automation (IA) by the Australian meat processing industry. The final report is intended to pave the way for building an enabler in the form of a dedicated research centre bringing meat processing industry and academia together.

Project Content

The project first surveyed the use of available intelligent automation technologies worldwide. It then mapped the use of existing or emerging automation, and in particular intelligent automation, in the Australian meat processing plants. The project finally delivered a detailed roadmap for successful transition of the meat processing industry to a desired future state that would involve appropriate use of smart automated machines.

Project Outcome

The main outcomes of this project were reviewing future intelligent automation (Industry 4.0) technologies, assessing the current state of automation in Australia and developing an industry roadmap for the future utilisation of intelligent automation in the Australian red meat processing industry.

The report indicates that although the Australian meat processing sector is high cost, it has yet to take advantage of intelligent automation technologies. The project has assessed technologies within carcass processing and meat packaging aspects and covered technologies in areas such as live animal processing, carcass cutting and deboning, animal body composition detection, employee safety, and smart warehousing. The report also shows that activities in the meat processing industry are labour intensive, repetitive, unpleasant, physically demanding and cause increased risk of worker injury. Intelligent automation acts as a real solution to these challenges.

After looking at the completed automation projects and current trials, it is evident that the industry is heading in the right direction but at a *very* slow speed. There are currently many opportunities for taking advantage of intelligent automation technologies, with real potential for increasing efficiency and productivity in meat processing operations, yet they remained untapped.

A proven pathway for speeding up the process and enabling the industry to take advantage of these opportunities is to learn from the very successful automotive industry and establish a collaborative research centre. This entity would foster partnership between the meat processing industry, equipment manufacturers and academia (jointly owned), and research, develop and implement the desired technologies based on the roadmap using a collaborative and agile approach.

The final roadmap covered several intelligent automation areas including general applications, animal handling, meat processing and supply chain. A sample is as follows:

Area	0-2 Years	2-6 Years	6-12 Years
Live Animal Handling	Livestock are tagged and traced along the supply chain using the National Livestock Identification System (NLIS). Input is entered by NLIS account holders	The radio frequency ear tags part of the NLIS track and store additional information such as weight gain and animal activity	Sophisticated use of Industry 4.0 technologies. Beyond 2030, transition to true Industry 4.0 will start to be more comprehensive when hardware, software and employees are Industry 4.0 ready.
	Manual handling and monitoring of animals in abattoirs	Some autonomous systems to be deployed for monitoring animal welfare and health prior to slaughter	IA technologies fully interoperable to create flexible systems
	No sensor or very limited amount used for monitoring animal conditions in abattoirs	Sensor network deployed to monitor every individual animal with basic information captured and recorded	
	Manual cleaning of animals before processing and holding pens	Fully automated systems that selectively apply cleaning to animals and holding pens to reduce water consumption and waste. Washing will include automated health and disease monitoring.	
	Some smart technologies utilised to minimise worker injuries	More advanced IA technologies utilised to replace workers with robots in all high-risk areas to eliminate injuries in abattoirs	Robots to operate effectively in unstructured environments and have dynamic adaption capabilities

Benefit for Industry

The project prepared a roadmap and advocated the establishment of a dedicated Meat Processing Intelligent Automation Centre based on the Australian Government's Industrial Transformation Research Program. As a dedicated and first of its kind, the above Centre will facilitate the collaboration amongst industry (meat processors as well as equipment manufacturers and service providers), industry bodies and academia, and enable the sector to transition from its current state to Industry 4.0 technologies. As an independent entity, the Centre would focus on serving the meat processing industry through an agreed R&D pipeline aimed at increasing the competitiveness and long-term sustainability of the sector amongst its global competitors.

By addressing and actively managing intelligent automation challenges including the human resource aspect and cybersecurity, the industry will gain tangible benefits. Improving animal welfare practices, higher yield and productivity, safer work environment, improved worker satisfaction, cost reduction and better product traceability are some of the benefits that could be achieved.

USEFUL RESOURCES

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