Final Report

AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Evaluation of Smart Glasses Technology to the Australian Meat Processing Sector

Project code
2024-1114

Prepared by
Pedro Contreras

Date submitted
03/06/2026

Published by
AMPC

Date published
9.6.26

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1.0 Abstract

JBS Australia remains at the forefront of innovation within the Australian red meat industry. This project will support a dedicated JBS resource for the Southern Business (Scone, Longford, Brooklyn, Bordertown, and Yambinya) and other JBS Australian Business Units as required, to identify opportunities for efficiency, cost reduction, safety, cultural improvement, and market advancement where innovation can make a meaningful impact.

Where applicable, the resource will apply for industry funding to support initiatives that have been approved internally by JBS. In addition to supporting a dedicated JBS innovation resource (and associated training) to deliver these projects for the benefit of JBS, this project will also enable the wider Australian industry to gain insights (without disclosing any confidential information) from the investments made by JBS and supported by the Australian Federal Government through the industry's matching R&D funding mechanism.

The resource will also be available to assist AMPC (and MLA) in industry activities, conferences, steering committees, and facilitate streamlined access to JBS Southern locations for the evaluation and delivery of industry-funded innovation initiatives.

2.0 Executive summary

Milestone 1

Purchase of one unit. Email update and purchase receipts provided to AMPC.

Milestone 2

Technology awareness in the office. Milestone report submitted to, and approved by, AMPC.

Milestone 3

Purchase approved units for delivery to Longford and begin environmental testing as per methodology. Milestone report submitted to, and approved by, AMPC. Milestone to include the decision process of the two additional unit's purchases, and initial environmental evaluation.

Milestone 4

Expansion and integration trials using pre- formatted historical data completed as per methodology. Milestone report submitted to, and approved by, AMPC.

Milestone 5 Advancements:

During Milestone 5, the project progressed from static, pre-formatted historical datasets to the delivery of live data into the smart glasses interface. This step directly addressed the original question of whether operational information currently viewed on systems such as Ignition screens could also be presented "in the eyeball" of supervisors, QA staff or maintenance personnel in near real time.

The live data work focused on:

- Establishing a technical pathway to move data from JBS systems into the smart glasses platform, considering hardware, software and security constraints.
- Confirming that the glasses could receive and display data updates in a manner consistent with previous historical data trials.
- Extending environmental and usability learnings from Milestone 4 like display readability, cold storage operation, mounting options into a live data context.

These activities have provided practical insight into how live plant information like safety or production metrics, might be surfaced to frontline staff and offsite management in support of real operational use cases such as quality checks, process monitoring, and packaging/label verification.

3.0 Introduction

This project addresses a gap in the red meat industry: operational data is often available on fixed screens, but not in a practical hands-free format for people working on the plant floor. It asks whether smart glasses can deliver real-time information directly to supervisors, QA staff, and maintenance teams in a way that improves safety, quality, productivity, and decision-making.

The project is focused on the people who need information at the point of work, especially frontline staff and managers across JBS Southern sites. Its results will help JBS decide whether to scale the technology further, while also giving the wider industry useful insight into how wearable digital tools can work in meat processing environments.

4.0 Project objectives

The objective of this project is to evaluate the feasibility of implementing a real-time data delivery solution for managers and team leaders using virtual method glasses. The project will assess the effectiveness, usability, and integration capability of three potential devices. It will also examine the environment in which these devices can be utilized, including fabrication, harvest, and other areas such as cold storage. Performance will be evaluated based on key metrics such as functionality, water and steam resistance, battery life, and room temperature tolerance.

If the unit is environmentally suitable (this will be evaluated first), then JBS will work with Virtual Method to ascertain how much data, in what format, in what screen location and size is suitable for a range of data sets as follows:

- Cutting specifications
- Sustainability data
- OEE data
- Food safety and quality data
- Machines that are dangerous to be near
- Are staff in correct positions with the required skills
- and many more

Finally, JBS and Virtual Method will ascertain any limitations of how to push real time data to the unit and what benefits using these devices adds to JBS and industry relating to increased productivity and efficiency.

5.0 Methodology

The project methodology is as follows:

- **Step 1.** Purchase of one unit. Email update and purchase receipts provided to AMPC
- **Step 2.** Technology awareness in the office. Milestone report submitted to, and approved by, AMPC.
- **Step 3**. Purchase of the second unit. Email update and purchase receipts provided to AMPC.

For one week, have few teams' leaders area wearing the units (no data being set) and evaluate fit for purpose from a pure wearability and environmental acceptance perspective for one hour. The evaluation will include:

A. Environmental: do the devices fog up, get wet, scratch, bounce when dropped, how atrocious they cleaned, does anti fog chemical impact them and any other unforeseen impacts in the overall environment.

B. Employee: Are they comfortable for employees to wear for a full production day, do they create any inverse OH&S concerns.

C. Devices are they durable enough and does the battery last an entire shift and are the devices able to be cleaned to a food safety level.

- **Step 4**. Build lightweight hub app, connect to Ignition systems, implement alert workflow.
- **Step 5.** Push pre-formatted historical data to the head units and evolve a data display design for a wide number of applications.

- **Step 6.** Push live data to understand this interface, System readiness.
- **Step 7.** Develop a report, with recommendations and feedback on how the units could be used (or not used).
- **Step 8.** Phased rollout across lines, training, monitoring.

6.0 Results

Completed Activities (Milestone 5):

The following activities associated with Milestone 5 are considered completed.

Live data push to devices

- Demonstrated the ability to push live data streams to the smart glasses interface, building on the pre-formatted data pipelines established in Milestone 4.
- Validated that the glasses can receive and refresh data frequently enough to support supervisory or QA-style monitoring.

Interface behaviour and usability with live data

- Confirmed that data categories previously tested as historical datasets as safety indicators, production related information can also be shown when driven by live sources, within the constraints of the device display.
- Used both M400 and M4000 units to understand how live updates interact with differences in display size, readability, and optical clarity identified earlier.

Continuation of environmental and operational validation

- Leveraged prior environmental testing including cold storage to ensure that live data delivery remains stable and that connectivity and screen sharing functions continue to operate reliably under realistic conditions.
- Used multiple mounting configurations to assess comfort and practicality for different roles like operators, team leaders.

Foundations for final reporting and recommendations

- Consolidated findings from all milestones into a draft set of insights on where and how the smart glasses could deliver value for JBS Longford operations.
- Identified candidate use cases such as packaging and label verification, training/onboarding, QA and food safety, and remote support as areas where live data and assisted reality can be most impactful.

In Progress:

While Milestone 5 has answered the core technical question of whether live data can be pushed to the devices, several elements remain in progress.

Data formatting and display optimisation

- Ongoing refinement of how live data is formatted, prioritised and placed on the display to ensure readability, especially for the M4000's larger but different optical system.
- Work continues to define role specific views like supervisor's vs QA vs maintenance to avoid information overload and ensure that only high value alerts and KPIs are shown.

Comparative and user acceptance testing

- Comparative assessment of M400 vs M4000 for specific task types such as label verification, cold room QA checks, training support is still underway, with a focus on the balance between clarity and readability identified in Milestone 4.
- Broader user acceptance testing, including comfort, adoption willingness, and perceived productivity impact across multiple roles and, ideally, multiple sites, is still to be completed.

End-to-end live integration and security

- Exploration of robust, scalable integration pathways from JBS Longford internal systems to the smart glasses platform including network, OT/IT segregation and security considerations.
- Further work is needed to determine which systems like QA systems, labelling systems are practical and safe to integrate in production environments, rather than in controlled trials.

Targets

- Creates a governance and funding structure where smart glasses are treated as a strategic capability to be nurtured and expanded.
- Ensures that every deliverable network integration, system integration is designed to unlock further work.

7.0 Discussion

Milestone 5 has confirmed that live data can be pushed to smart glasses and refreshed fast enough for real supervisory and QA use, building on Milestone 4's stable historical data trials. Both M400 and M4000 units successfully displayed live operational information, including safety and production data, while environmental testing in cold storage and various mounting setups proved the devices work reliably under realistic plant conditions.

The milestone also helped identify the most promising use cases for JBS Longford, such as packaging and label verification, training, QA/food safety, and remote support areas where hands-free, real-time information can deliver clear value.

However, some work remains. Data formatting and display optimisation still need refinement, especially for the M4000, to create role-specific views without overwhelming users. Comparative and broader user acceptance testing across roles and sites is still ongoing. End-to-end integration and security also require further work to determine which JBS systems can safely connect in production environments. Overall, smart glasses are no longer just an experiment; they are becoming a credible, strategically valuable capability for JBS.

8.0 Conclusions

The project has demonstrated that live data can be successfully pushed to the smart glasses and displayed in a functional way, confirming the technical feasibility of real-time information delivery to frontline workers and managers. This builds directly on the stable performance observed with historical data in Milestone 4 and it strengthens the case that smart glasses can serve as a viable channel for operational data within JBS environments.

Overall, the project is now at a point where smart glasses can be considered technically feasible and environmentally suitable for selected meat processing use cases, but further targeted work is required before large scale operational deployment.

9.0 Recommendations

Smart glasses technology project represent a step-change platform to reduce cost, lift productivity, and position JBS as a global leader in digital meat processing. Earlier AMPC work with Vuzix M400 devices showed that the cost of a unit and associated software could be recovered in as little as two audits, with some large plants needing up to 80 audits per year, delivering a very strong return on investment through reduced travel and compliance cost alone. When this is combined with the broader XRAI Vision use cases frontline productivity, remote management, quality assurance, training, safety and packaging/label verification the upside for JBS is substantial.

1.**Scale remote audits and virtual**

- Build on the proven AMPC/Brisbane smart-glasses audits experience by extending remote, real-time inspection capability across more JBS sites, reducing travel, downtime and disruption for third-party and regulatory audits.
- Use the Milestone 5 live data integration work to support richer remote sessions KPIs, alarms, checklists so auditors and offsite specialists can see both the process and the data stream in real time.

2.**Empower the frontline workforce with hands free data and guidance**

- Prioritise use cases where hands free access to live information and checklists directly lifts throughput and reduces errors like packaging and label verification.
- Combine smart glasses with IoT sensors and computer vision so operators receive real time prompts, alerts and XR marks at the point of work, maximising productivity, safety and skills retention as set out in the business justification.

3.**Turn packaging and label verification into a flagship use case**

- Elevate Packaging & Label Verification as a hero scenario that clearly demonstrates value: operators can verify SKU, confirm correct labels such as halal vs non-halal, allergen declarations, and seal integrity in real time, with smart glasses highlighting mismatches and potential non compliances.
- Over time, integrate AI-based vision capabilities to detect carton bulging, leakers in cryobags and other defects automatically, simultaneously reducing rework, waste and the risk of export non-compliance.

4.**Standardise quality, safety and compliance across JBS**

- Use smart glasses as a common platform to standardise checklists, SOPs and HACCP workflows across sites, ensuring that quality and hygiene standards are consistently executed and recorded.
- Capture photos/videos with time stamped evidence for audits and continuous improvement, creating a rich, traceable dataset that strengthens JBS's position with regulators, customers and export markets.

5.**Transform training, onboarding and workforce resilience**

- Deploy the technology as a live training and knowledge-transfer tool 3D live hands on tutorials, hazard visualisation, first person guided procedures, and multi-lingual instructions directly in the field of view.
- Use this to reduce time to competence for new workers, mitigate skills shortages and support an ageing or more mobile workforce, while improving safety and reducing errors.

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11.0 Appendices

11.1 Appendix 1- Vuzix M400

Smart-glasses model built around the Qualcomm Snapdragon XR1 platform, with an OLED nHD display, 16:9 aspect ratio, and a 16.8-degree diagonal field of view. It is designed for hands-free industrial use and is commonly promoted for remote assistance, workflow support, and connected-worker applications.

Key features

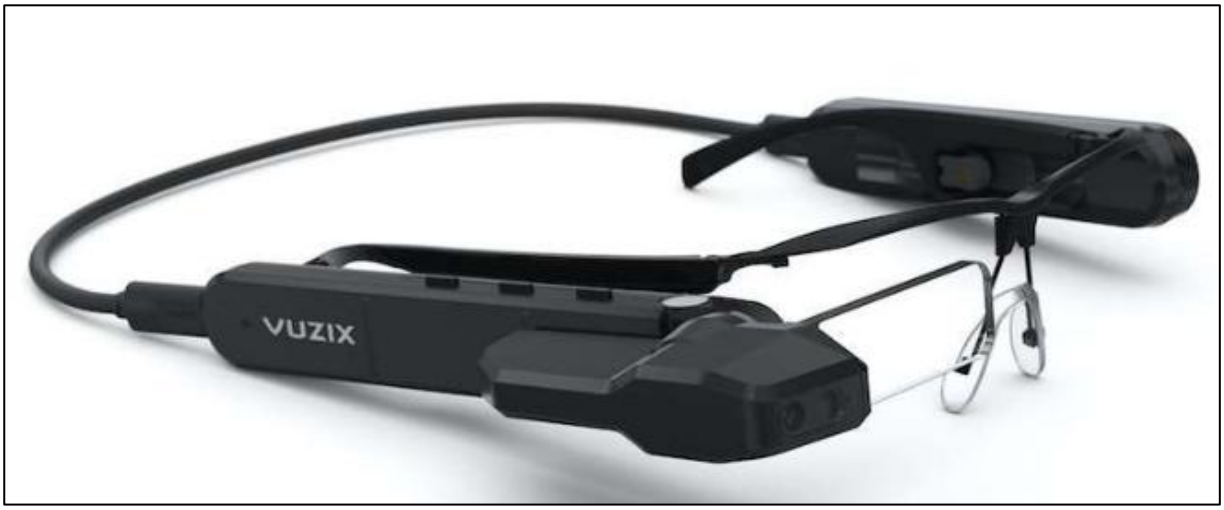
- Display: nHD color OLED, 640 x 360 resolution.
- Brightness: over 2,000 nits.
- Camera: up to 13-megapixel stills, 1080p video at 60 fps.
- Head tracking: 3 degrees of freedom with gyro, accelerometer, and compass.
- Connectivity: Wi-Fi, Bluetooth, USB-C, GPS, and integrated sensors.
- Battery: hot-swappable battery support, with external battery options for extended use.

11.2 Appendix 2 – Vuzix M4000

Smart-glasses model built around see-through waveguide optics, designed to give users a hands-free heads-up display while keeping the real world visible. It is positioned as a more immersive, industrial-ready alternative to the M400, with a brighter display and an emphasis on augmented-reality workflows.

Key features

- See-through display: waveguide optics, so the display sits over the real-world view rather than blocking it.
- Display specs: WVGA colour display at 854 x 480, 16:9 aspect ratio, 28-degree diagonal field of view, and 5,000 units brightness.
- Industrial use: designed for hands-free work in challenging environments, including inspections, support, and field operations.
- Rugged package: the All Weather Kit is IP67 rated for dust and water resistance and includes a battery, safety frames, headband, tinted accessory, and protective case.
- Compatibility: Vuzix describes it as backward compatible with the M400 platform.



12.0 The case for Phase 2

From Feasibility to Scale – Smart Glasses Opportunity Phase 2

Milestone 5 has been an important step forward for the project. We have now moved beyond static historical datasets and successfully shown that live data can be delivered into the smart glasses in near real time. That is a meaningful outcome, because it answers the original question of whether information already visible on systems like Ignition screens can also be brought directly into the line of sight of supervisors, QA staff, and maintenance teams.

This milestone has also helped us better understand what smart glasses could genuinely offer in a working JBS Longford environment. It has shown that there is real potential to use this technology for practical tasks such as safety monitoring, production visibility, quality checks, and packaging or label verification. At the same time, the work has confirmed that there is still plenty of room to refine how the information is presented, how it is tailored to different roles, and how it connects securely to JBS Longford systems.

Just as importantly, the project is starting to show clear momentum. There is a real opportunity here to take the next step into a Phase 2 trial, where we can explore richer use cases, stronger integrations, and broader user testing. Based on what has already been achieved, it feels clear that JBS Longford has both the interest and the capability to build on this foundation. In that sense, this is not just a technology trial anymore, it is becoming the beginning of something that could deliver lasting value across the business.

The results to date position JBS Longford not only to capitalise on immediate efficiency and compliance gains, but to establish a leading, future-ready digital capability that can be scaled confidently across its operations.