AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Remote Operations (Gamification)

AMPC Project 2021-1134 Remote Operations Gamification – Stage

Project Code	Prepared by		Date Submitted
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Project Description

Australian Meat Processing Corporation (AMPC) (and the industry) have an innovation vision, and support R&D program, to eliminate all Work Health and Safety (WHS) incidents from processing operations. Where possible dangerous tasks will be semi or fully automated. Where automation is not currently viable (either due to technology limitations or ROI), semi-automated/remote solutions will be developed that will remove the operator from dangerous tools and implements. Where semi-automated solutions are not viable then the remaining hands-on tools will be made as safe as possible (i.e. BladeStop and Guardian).

AMPC has created a 5 stage 'Remote operations (operators in control rooms of off-site via gamification)' roadmap (refer to Theme on a Page (ToaP) image 1) to deliver the following primary goal of: at the conclusion of all development stages Australian beef processing facilities have operational staff undertaking scribing activities without being adjacent to the carcase and holding onto the scribe cutting saw; and secondary goals of the following: a desired achievement in these areas: (1) develop an on-line training tool for current and pending processor operational staff, (2) develop a public (end of Stage 2) offering that enable future possible employees to obtain a different understanding of processing roles within beef plants, (3) provide an alternative way to renumerate staff based on cutline placement accuracy and speed, (4) provide a wider pool of staff suitable for the task, and or, a role for light duty staff, and or, staff with less mobility and (5) evaluate if the task can be performed remote from site.

Image 1: Theme on a Page (ToaP)
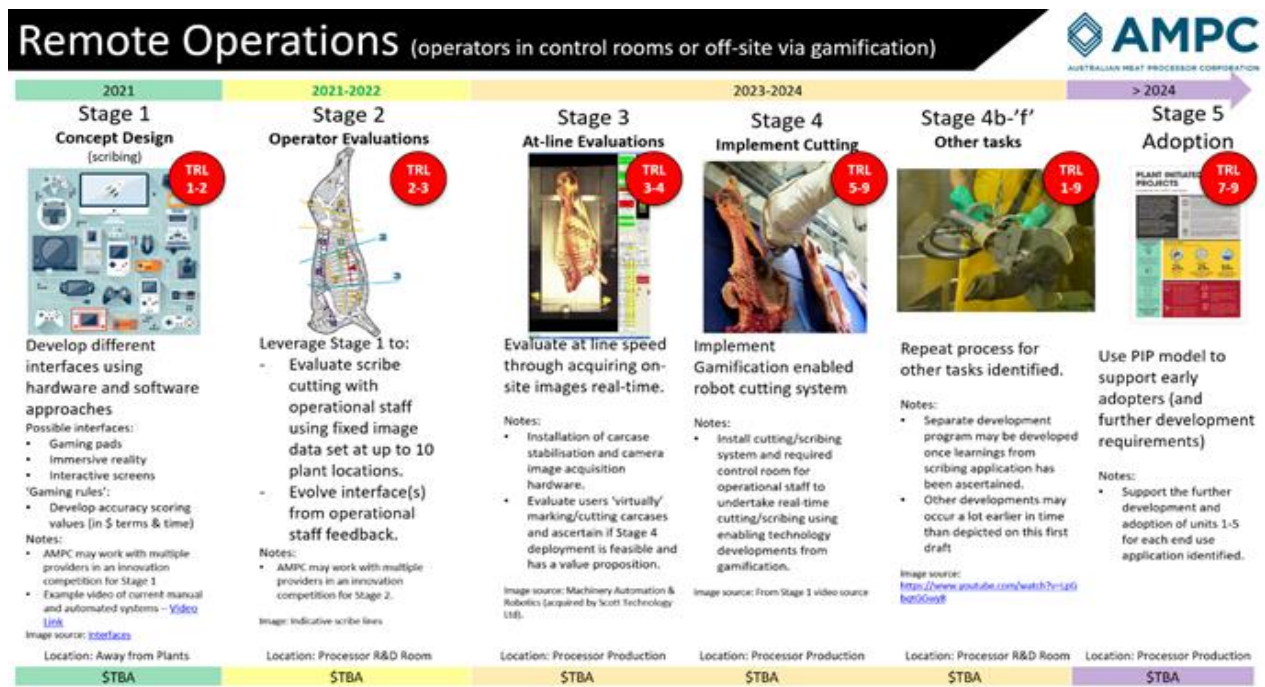
This project is focused on Stage 1 development scope only (refer ToaP image 1). The final output was to create a beef scribing minimum viable product (MVP) experience, with the aim of not only engaging and training industry members but non-industry 'gamers' alike to immerse themselves in and almost forget that they are undertaking a beef scribing activity and focus on beating both their own accuracy/time scores and that of others, globally, who have registered to play the game.

A final ideal outcome for Stage 1 & 2 is an engaging game that is compelling for industry and non-industry 'gamers' alike to immerse themselves in a beef scribing activity and focus on beating both their own accuracy/time scores and that of others, globally, who have registered to play the game.

Project Content

The following 3 key high-level outputs for this stage 1 of the project was defined and used as milestone tracking:

1. Develop a gaming interface for beef scribing and demonstrate the system operational to AMPC staff.
2. Develop a 'gamer' option for the interface that enables competitions to be undertaken within the interface.
3. Recommendations on Stage 2 developments and improvements (including potential investment requirements)

A Wunderman Thompson 'double diamond' design thinking framework was applied as a project methodology, it covers 4 phases of human-led design (discover, define, develop, and deliver). Each phase was critical in informing the next and allowed Wunderman Thompson to take clear, strategic steps in the concepting and decision-making process.

In the 'discovery' and 'define' stage, a rigorous strategic process was applied. At the end of the 'define' phase, Wunderman Thompson were able to confirm gamification training, multiple audience and alignment on the digital experience approach. Additionally, AMPC identified 'large touchscreens' as the preferred and focus technology for Wunderman Thompson's concept development. Beyond assessing the total project objectives, Wunderman Thompson created a digital experience concept criteria based on best practice, this was used throughout the project milestones to assess the concepts and User Experience (UX) and User Interface (UI) of the game development.

In the final develop and deliver phase, the 'Beef Scriber Game' MVP experience for user-testing was built. A game that is focused on a step-by-step educational journey on beef scribing, particular cuts and gamifying the action through relevant scoring based on accuracy and speed. The creation of the MVP was based on a specific budget so designs, game logic, and integration is based on that investment level. Recommendations to deliver higher aspirational bells and whistle to ensure a highly interactive and polished gamification output required additional investment and are recommended for the next MVP iteration. The final MVP experience has delivered a structured, and interactive game logic that pushes the user to conquer game levels from easy to highly complex with the time restrictions. Due to the complex nature of the Beef Scribing operation additional features such as hints and pop-up tips have been integrated into the game to ensure the user stays engaged and continues gaming and learning.

Some specific content details are detailed below:

Interface data set
The interface has been developed using a set of 20 two-dimensional beef side images taken from a processing plant and created into a moving series on the operation line.

User interface

An introduction and tutorial level has been created for training and education on the specific cuts, accuracy, and timing requirements and how to interact with the game (See Image 1 and 2 for references). The focus of the introduction and training tutorial level interface is to enable an operator to practice 'placing the scribe lines' on different carcase images, and the system highlight how accurate each scribe location was (based on the AMPC marked up carcase scribe locations).

Images 1: Introduction interface examples below:
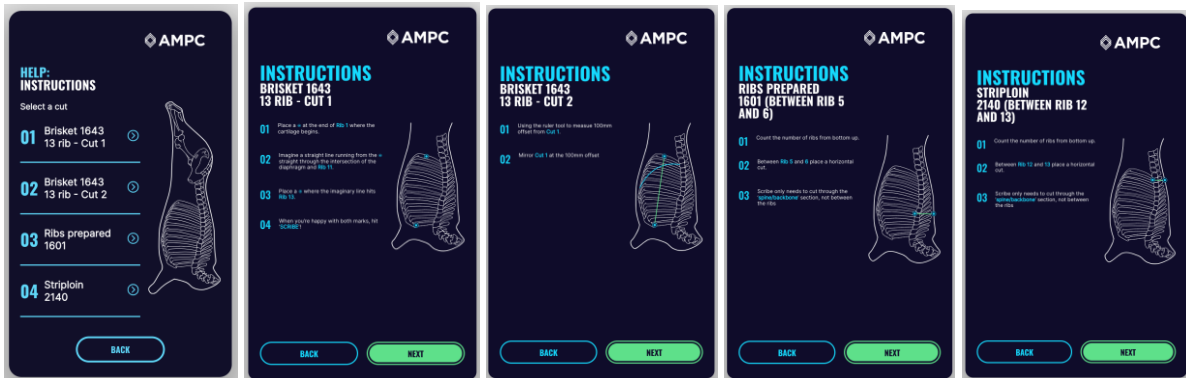
Images 2: Tutorial interface examples below:


Gaming Mode

The gaming component was introduced to motivate and inspire users to return to play rover and over again, whilst also giving us a way to track and document results of the varying individuals. The levels go from beginner to intermediate to professional, the game complexity increases through the variation in carcasses, the accuracy of the start and end points, plus a time limit is added.

On the assumption that all carcases were marked within the allocated time and within +/- 5-15mm, then the 'gamer' will progress to the next round, where a time limit is applied. The next round requires the gamer to accurately scribe all 4 cuts within a total of 20 seconds between carcasses, and they keep going until they

get a cut wrong, which then sets the game to start from the that level beginning again. The gamer will not proceed through to the next level until they accurately scribe within the time limit set.
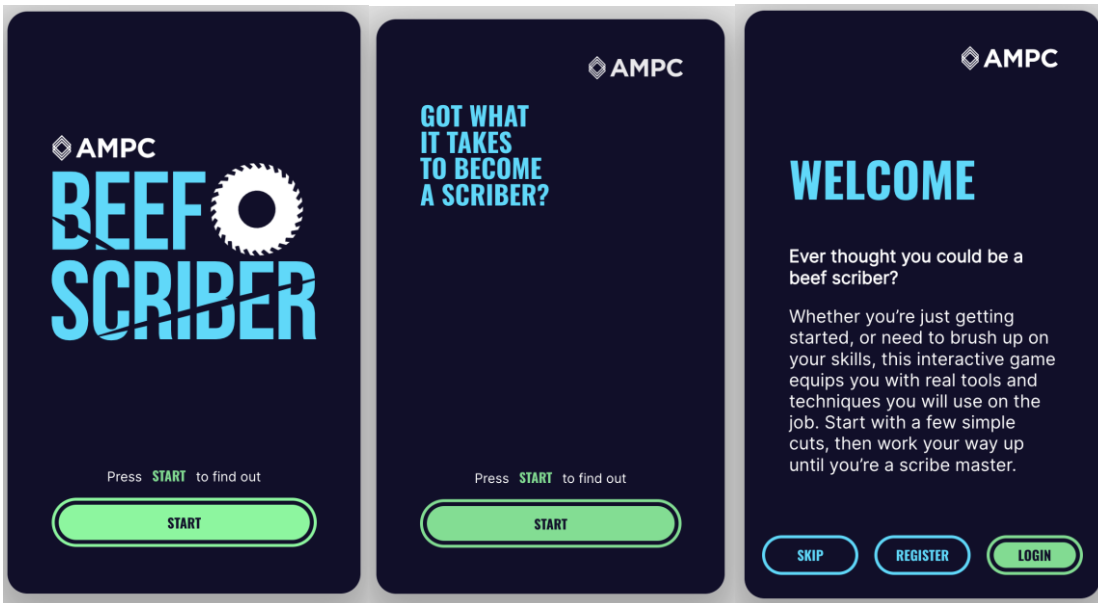
All results of individual scores are recorded in a leader board that has a geographical, individual (site) and company view (See Image 3). This leader board has been designed to be future proofed for a local leader board per location and the ability to enable global.

Image 3: Leader board
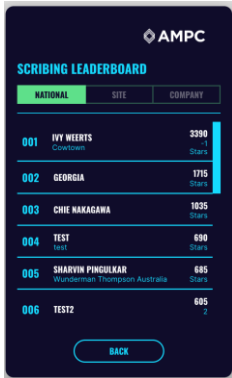
Project Outcome

Beef Scriber MVP Game

Gaming experience functionality and link

The Front-end development team built the HTML (Java Script and CSS) to ensure the UX and Interaction designs were applicable for all users across multiple devices.

All visual components developed for the platform are modular, reusable, and flexible enough to make them efficient to maintain and extend.

All technology platforms chosen, and hosting solutions implemented were recommended due to their security nature along with the features provided.

MVP has a built-in CMS to report on user statistics, after a period of multiple user interactions, detailed reports can be exported for overarching and optimisation analysis.

In addition to the above elements, these considerations were factored in the development and functionality:

- o Hardware specifications need to align closely with the content requirements. It must allow for high-definition graphics, animation and visual effects and fluid game interaction.
- o Hardware specifications need to align with plant office environments, be easy to install and dismantle, transportable and simple to turn-on.

Link to gaming staging experience is: https://beef-scriber.vercel.app/#/

Future MVP optimisation and iterations

The game has been built in a way that can easily be enhanced, adapted, and tested. Once the game is tested with further end-users it is recommended to implement further improvements to a future MVP release that will enhance the gamification aspect (i.e, audio and further visual) and evolution of the game levels to include more product-specs and/or extend through to other roles/operations i.e. Sheep Trimming.

To date the User Assurance Testing approach has only been conducted with AMPC and Wunderman Thompson stakeholders which has led to multiple MVP improvements being applied already. The key next step in this MVP development and optimisation is conducting end user-testing across multiple processing plants (with JBS looking to be the first partner to activate this), and with relevant industry event participants.

Benefit for Industry

Below is a detailed list of the many benefits this project could deliver to the industry. The majority of the benefits can be bucketed into two key areas Advance Manufacturing (Adv. Mft.) and People and Culture programs.

1. Removing staff from dangerous operations, via Hands-Off processing (Adv. Mft.)
2. Carcase Primal Profitability Optimisation, via accurate processing (Adv. Mft.)
3. Digitisation (future proofing the operation), via acquiring product information and leveraging data insights (Adv. Mft.)
4. Attraction, via demonstration and developing a wide range of operations (People & Culture)
5. Retention, via improving working conditions and making tasks exciting (People & Culture)

6. Development, via developing tasks that require higher skills and intellect – operational & technical (People & Culture)
7. Safety and Wellbeing, via reducing the high-risk nature of processing operations (People & Culture), are all foci of AMPC, and that this one innovation theme will aim to make a significant impact upon all seven.

Useful resources

AMPC Project 2021-1134 Final report and specifically all the links in appendices.

Details on gamification and benefits:

1. https://www.linkedin.com/pulse/gamification-increase-meat-processing-efficiency-attract-starling/?trackingId=%2FQXJ%2Fsk%2BS9%2BnaJYtkjt5Fw%3D%3D
2. https://www.linkedin.com/pulse/gamification-increase-meat-processing-efficiency-attract-starling-1c/?trackingId=2hsUl%2F1yRiePVkdO9ETomA%3D%3D