Final Report

AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Retain Talent –

Machine Learning as a tool to improve retention (Horizon 2) – Processor #1

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Prepared by
Toustone

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1.0 Abstract

AMPC invested with Toustone via project 2022-1138 to understand if it is possible using machine learning to predict if someone is going to leave an organisation in the next 12 months (Horizon 3).

Preliminary results have been very favourable, the next phase is to take the model- test, validate and scale ready for industry adoption.

The overall intent will be to aid 5 plants to undertake the Horizon 2 scaling of the machine learning model post the completion of project 2022-1138 Machine Learning as a tool to improve retention (Stage 1).

2.0 Executive summary

Staff retention is an ongoing issue for many Meat Processors. Toustone developed a machine learning tool, RetainTalent, that utilises company Human Resource data to identify staff at risk of leaving the organisation.

RetainTalent is a product that uses machine learning and data science to provide early predictive insights into staff turnover. It extracts HR history data to identify leasing indicators contributing to staff attrition, allowing businesses to employ targeted retention strategies.

- Objectives

The objectives of the project were as follows:

  - Build on the learnings from 2022-1138 Machine Learning as a tool to improve retention (Stage 1) by testing RetainTalent Machine Learning Tool at the processing plant.
    - Identify areas for improvement based on current environment over a 12 month period.
    - Identify and understand how long a person needs to be in a company before the machine learning model becomes accurate.
    - Further identify data sets that enhance the prediction accuracy.
  - Gain insights from the participating plants of the benefits of using the RetainTalent.
  - Data from the learnings to be fed into the AMPC data portal.
  - Develop the roadmap forward for wider industry adoption (Horizon 1).

- Methodology

The methodology employed was to:

  - Identify and select a processor via the AMPC EOI process which represent Australian Meat processing sector.
  - Collect and analyse HR reporting data in the Retain Talent Machine Learning model over a 12 month period. The data under analysis includes employment status, tenure and FTE, employee demographics and leave taken. Additional data metrics will be analysed and included where available.
  - For each participating the following steps will be undertaken:
    - Pre-Implementation Assessments.

- Model Training and Optimisation:
- Implantation and Deployment:
- Effectiveness and Evaluation
- Validate and verification
- Documentation and Reporting

- Outcomes

The Retention model and reporting was in place for 12 months. Regular data loads were automated over this period with the machine learning algorithm applied to the updated data at the beginning of each month.

The retention predictions were loaded into dashboards monthly with access to the reporting suite providing via Yellowfin.

Retraining of the algorithm has not been necessary as the accuracy rate has been maintained at 86% with only minor fluctuations, none of which have been below 85%. The accuracy threshold was set at 85%.

Unfortunately, the meat processor chose not to pursue the machine learning model beyond the 12 month research trial and the model and reporting suite has been shutdown. No further Meat Processors were recruited to participate in the trial and the project has no finished.

3.0 Introduction

Staff retention is an ongoing issue for many Meat Processors. Toustone developed a machine learning tool, RetainTalent, that utilises company Human Resource data to identify staff at risk of leaving the organisation.

RetainTalent is a product that uses machine learning and data science to provide early predictive insights into staff turnover. It extracts HR history data to identify leasing indicators contributing to staff attrition, allowing businesses to employ targeted retention strategies.

Key features and benefits include:

- Predictative insight: Understand individual factors driving staff turnover, such as role, manager, behaviour, rostering, and salary.
- Targeted strategies: Develop specific strategies to address key drivers of attrition.
- Incresed lead time: Managers gain more time to intervene before valuable employees leave.
- Improved outcomes: Retain staff, enhance workplace culture, increase productivity, and save time and money.

AMPC funded Toustone to run 12-month trials of the RetainTalent model with participating Meat Processors. 5 Meat Processors were to be recruited across Australia. The first of these was a medium sized processor. AMPC was to work with Toustone to identify and recruit the remaining 4 processors.

4.0 Project objectives

The objectives of the project are as follows:

1. Build on the learnings from 2022-1138 Machine Learning as a tool to improve retention (Stage 1) by testing RetainTalent Machine Learning Tool at the processing plant.
    a. Identify areas for improvement based on current environment over a 12 month period.
    b. Identify and understand how long a person needs to be in a company before the machine learning model becomes accurate.
    c. Further identify data sets that enhance the prediction accuracy.
2. Gain insights from the participating plants of the benefits of using the RetainTalent.
3. Data from the learnings to be fed into the AMPC data portal.
4. Develop the roadmap forward for wider industry adoption (Horizon 1).

5.0 Methodology

- Identify and select a processor via the AMPC EOI process which represent Australian Meat processing sector. Companies selected on the basis of;
    - Business employment size,
    - Business ownership structure,
    - Business location.
- Set up and Provide user license for 5 Yellowfin users for year one which will be used by processors to visualise and reporting on the data and machine learning insights.
- Collect and analyse HR reporting data in the Retain Talent Machine Learning model over a 12 month period. The data under analysis will consist of the following as a minimum, noting the more data sets the company can provide the more predicable the results;
    - Employee ID
    - Gender
    - Year of Birth
    - Employment Type
    - FTE
    - Leave Hours taken
    - Employment start Date
    - Employee Site
    - Employee Location
    - English as a Second Language
    - Visa - Citizenship Status
    - Home Postcode
    - Date of Departure

Where possible the following metrics will also be included:

- Injury Data
- Exit and Engagement Survey Results
- Others as identified.
- The project will cover all associated on costs such as hosting and a maximum of 5 Yellowfin user licenses in year one.

- Toustone maintains flow of data as required to AMPC to maintain the HR reporting environment and will be inputted into the AMPC Data Portal.
- Toustone provides AMPC with quarterly reports summarising learnings on the model.
- Toustone further refines model and analysis outputs as part of our ongoing product development.
- Based on the outcomes against Horizon 2 develop a roadmap for Horizon 3 Adoption model.

For each members data sets the following methodology will be used:

- Pre-Implementation Assessments.
  - Toustone will work with the member to prepare the data in the relevant formats and set up connections where applicable to the members software system.
- Model Training and Optimisation:
  - Train the ML model using historical data on staff turnover and relevant predicted variables as outline above.
  - Select the appropriate ML algorithms.
  - Fine-tune hyperparameters and optimise the models performance.
- Implantation and Deployment:
  - Integrate the trained ML model into the members computer management systems.
  - Develop user interfaces and dashboards.
  - Provide training and support to users on how to interpret and utilize the tools output effectively.
- Effectiveness and Evaluation
  - Define KPIs with the member for staff retention.
  - Collect baseline data before implementing the tool.
  - Monitor change in the KPI's overtime following the implementation of the tool.
  - Conduct statistical analyses to assess the impact of the ML tool on staff retention outcomes over the period of the trial.
- Validate and verification
  - Validate the effectiveness of the ML tool as a HR tool to improve retention
  - Verify the consistency and reliability of the tools predictions across different subsets of data and time periods.
  - Address any discrepancies and discrepancies identified during validation and verification, iteratively refining the ML tool as needed.
- Documentation and Reporting
  - Document the process including data preparation, model training, deployment and effectiveness evaluation.
  - Prepare a report of the member and AMPC of the outcomes.

6.0 Results

The first processor selected was Tasmania Quality Meats.

The following data was collected:

Employee

- Employee ID
- First Name
- Last Name
- Email
- Home Address | Home postcode
- Gender
- Date of Birth | Year of Birth
- Employment Type
- Current Role
- Employee Location
- Employee Site
- Employment Start Date
- Termination/Departure Date
- Termination Reason
- English as a second language
- Visa type | Citizenship status
- FTE
- Contract Hours per Week
- Paying rate per Hour

Injury Records

- Employee ID
- Injury Date
- Injury Reason
- Treatment

Leave

- Employee ID
- Leave Date
- Leave Hours Taken
- Leave Type

The above data was ingested into Toustone's Talent Retention Machine Learning Algorithm. The outputs of which were then displayed into a set of dashboards with graphical representations of the Employee departure risk over the next 12 months. Historical prediction sets were also provided for the previous 12 months.

The reports are housed in a Yellowfin environment, and 5 users are available for use by Tasmania Quality Meats.

7.0 Discussion

Timing and 'buy-in' by the Meat Processor is key to the ongoing success of RetainTalent within the Meat Processing Industry.

8.0 Conclusions

RetainTalent while providing required accuracy levels was not the right fit for the Meat Processor at the time and they chose not to continue with the use and retraining of the model beyond the initial 12 month trial period.

Only one processor was recruited to participate in the trial not the 5 initially sought.

9.0 Recommendations

The RetainTalent model remains a viable machine learning tool that can be applied to new Meat Processors should the need arise in the future.

10.0 Project outputs

The Retention model and reporting was in place for 12 months. Regular data loads were automated over this period with the machine learning algorithm applied to the updated data at the beginning of each month.

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11.0 Bibliography

Not Applicable

12.0 Appendices

Not applicable