SAP Innovation Awards 2018 Entry Pitch Deck

Transforming Taxpayer Services With Tax Insights powered by SAP Leonardo Machine Learning

Office of State Revenue, Queensland Treasury, Australia

Transforming taxpayer services with Tax Insights powered by SAP Leonardo Machine Learning

Queensland Office of State Revenue, Queensland Treasury

Australia   Public Services

The Office of State Revenue (OSR), has had a long-standing relationship with SAP commencing in 2009 with the implementation of SAP Tax and Revenue Management, as the core transactional solution to manage OSR's $17bn revenue base. In 2017, OSR began a journey to provide next generation tax and revenue management capabilities that are client centric, digitally enabled and data driven, to improve outcomes for taxpayers, staff, government and the Queensland community.

As part of this program, OSR partnered with SAP to develop a proof of concept using SAP Leonardo machine learning (ML) capabilities and SAP HANA PAL. The objective is to transform taxpayer services—specifically for revenue collection and debt management.

The proof of concept solution provided capability, not possible before, to predict taxpayers who may become debtors—to a 71% accuracy level. This accuracy is expected to increase in production as more data sources are added.

The proof of concept also provided insights into the causes for tax default at both an aggregate level across all taxpayers and individual taxpayer level.

The business value of this solution is significant, providing OSR with the ability to:

- deploy proactive intervention strategies, to reduce the total number of taxpayers from becoming debtors; and
- provide personalised management strategies tailored to individual taxpayer's circumstances— improving taxpayer services and overall debt collection rates.

"The insights gained through this powerful and innovative machine learning technology will enable the Queensland Government to deliver better services and outcomes for taxpayers and all Queenslanders."

Elizabeth Goli
Commissioner of State Revenue, Queensland
(Chief Executive Officer, Office of State Revenue)

- SAP Customer Retention powered by Leonardo (customized for OSR)
- SAP HANA Predictive Analytics Library (PAL)
- SAP HANA Enterprise Data Warehouse
- SAP Fiori custom user interface
- SAP HANA Enterprise Cloud
- Integration with SAP Fraud Management and CRM (planned for 2018)

71% accuracy in predicting taxpayers who may become debtors

71%
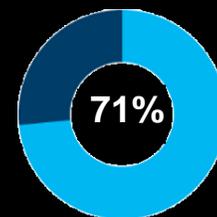
> 5% potential improvement in debt collection
> 5% potential reduction in debtors

5%   **5%**

Insight required for personalised management and interactions at an individual taxpayer level

Participant Information

Transforming Taxpayer Services with Tax Insights powered by SAP Leonardo Machine Learning

Office of State Revenue, Queensland Treasury

Public Services

https://www.treasury.qld.gov.au

The Office of State Revenue (OSR), part of Queensland Treasury, is a public sector agency in Queensland, Australia.

OSR plays a critical role in delivering simple, efficient and equitable revenue management services for State taxes, mining and petroleum royalty revenue, and revenue from fines and penalties. OSR also delivers initiatives that support economic growth and job creation, through personal and business tax exemptions, concessions and grants.

Through the administration of a revenue base of $17 billion, the revenue management that OSR provides is critical to the future prosperity of Queenslanders and helps fund essential services expected by the Government, taxpayers and community.

OSR prides itself on providing Queenslanders with expert, insightful and trusted stewardship of Queensland revenue.

Operating on a SAP Tax and Revenue Management platform since 2009, with an upgrade to SAP HANA in 2015, OSR is recognised as a world leader in embracing innovation. OSR is an early adopter of SAP solutions, which are enabling OSR's digital transformation.

Solution Overview

In the digital age, traditional ways of providing revenue services are no longer acceptable. Expectations are changing, and the ecosystem that OSR operates in is evolving. Taxpayers now demand services that are personalised, transparent, seamless and timely. Staff are demanding improved processes that will drive greater efficiencies. In parallel, OSR still needs to deliver on the revenue commitments that are required by the government and the community.

To ensure that OSR remains effective and relevant in this changing environment, in 2017 OSR commenced a three-year Digital Transformation Program. The program aims to provide next generation tax and revenue management capabilities that are customer centric, digitally enabled and data driven to improve outcomes for taxpayers, government and community.

As part of this program, OSR partnered with the SAP Innovation Centre to deliver a proof of concept for a custom built solution using SAP Customer Retention Powered by Leonardo Machine Learning and SAP HANA Predictive Analytics Library (PAL). The Tax Insights powered by SAP Leonardo Machine Learning proof of concept's objective was to transform services provided to taxpayers, specifically revenue collection and debt management.

The machine learning model was designed, built and delivered during an 8-week innovation sprint. **The initial focus for the proof of concept was land tax debt, due to the high rates of payment default experienced for this tax line.** As part of the proof of concept, the application assessed more than 187 million data records of 97,000 taxpayers across 7 years and was able to pinpoint and predict 71% of taxpayers that became debtors. By offering never-before-seen insights into the taxpayer journey, the solution was able **to identify the high-risk events or influences that led to default. Also, the solution was able to distinguish between taxpayers who had the capacity to pay but chose not to and those who were in genuine financial hardship and required additional support. Both types of taxpayers require different approaches and responses, and being able to know when to apply one response over the other is critical to a client centric approach.**

One size does not fit all when considering revenue collection and debt management. The power of the proof of concept was that it established a personalised model for future revenue service delivery. This could be used by on-the-ground staff to provide taxpayer profiling, segmentation and earlier intervention into a taxpayer's payment journey. These capabilities will transform the interaction and engagement that taxpayers have with OSR in the future.

The proof of concept project proved that future application of this model in a production environment will lead to more timely collection of revenue and a reduction in debt across all tax lines, leading to better revenue outcomes to fund essential services for Queenslanders.
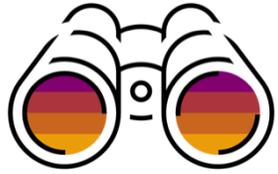
Solution Details

Tax Insights powered by Leonardo Machine Learning

- Custom built application that used SAP Customer Retention powered by Leonardo ML and SAP HANA PAL to develop a **Debtor Insights Model** for citizens.

SAP HANA

- Enterprise Data Warehouse on SAP HANA to bring in data from various systems (SAP & Non-SAP) in the landscape for deep analytics.

SAP Fiori

- Custom Developed User Interface built to enhance the User Experience and provide a visualisation of the insights through a map of taxpayers journey, illustrating their risk profile over time, allowing front line staff to consume and understand them.

SAP HANA Enterprise Cloud

- Core OSR business runs on private, enterprise cloud platform.

Integration to SAP Fraud Management and CRM (planned for 2018)

- Integration with other SAP applications like SAP Fraud Management and SAP CRM to provide the users with a seamless user experience across applications.

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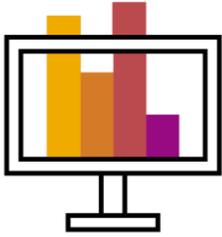
Benefits

Business value:

- The machine learning application will enable OSR to identify taxpayers who may be at risk of becoming debtors—before they default—therefore allowing us to implement proactive intervention strategies, such as personalised payment plans customised to an individual's circumstances and needs, to prevent them from becoming debtors.
- The risk profiling provided by the application will enable OSR to segment and tailor communications to taxpayers that better support them to meet their obligations. This will include sending digital alerts to give taxpayers payment options and remind them in advance about when and how much to pay, educating them on their tax liability and when it is due and building awareness of their obligations.
- This value will translate into the realisation of the following measures:
  - Estimated improvement of 5% in debt / revenue collection
  - Estimated 5% reduction in the number of debtors
  - Improvements in the debt finalisation rate, and
  - More timely revenue collection—ensuring that the government can meet its commitments to the state.

Social value:

- The machine learning application will allow OSR to distinguish between taxpayers who have the capacity to pay but choose not to and those taxpayers who are in genuine financial hardship and therefore require additional support. Both of these types of taxpayers require different approaches, but being able to know when to apply one over the other is critical to a client-centric approach.
- A more responsive and tailored approach to individual taxpayers will lead to more timely collection of revenue and reduction in debt across all tax lines, and additional revenue to fund essential services for Queenslanders.

Human empowerment:

- The machine learning application will provide insights to enable our staff to better understand individual taxpayer's circumstances and needs.
- The machine learning application will allow staff to be engaged in more interesting and value-adding activities, which will make a real difference to both taxpayers and revenue outcomes.
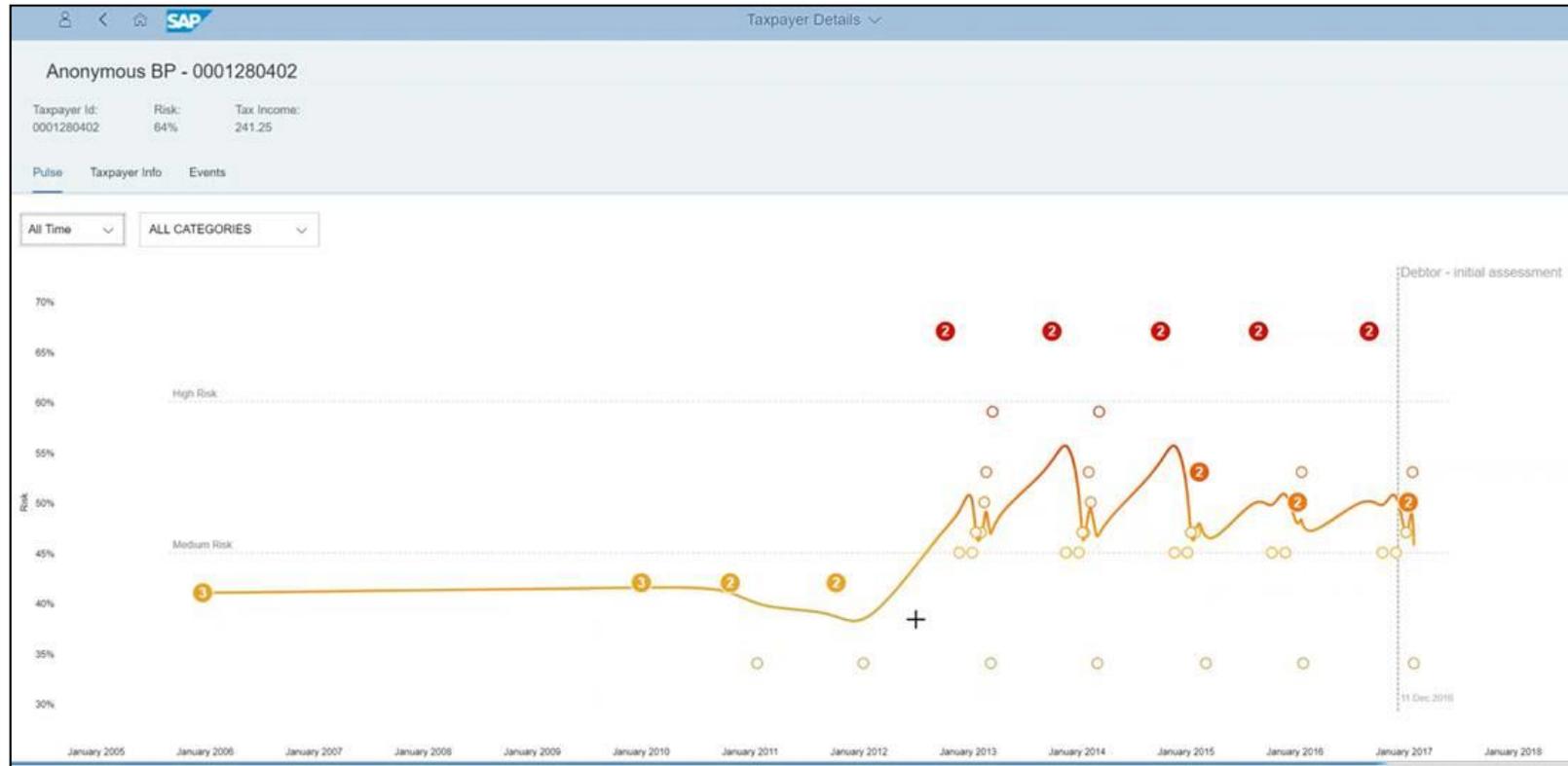
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Architecture
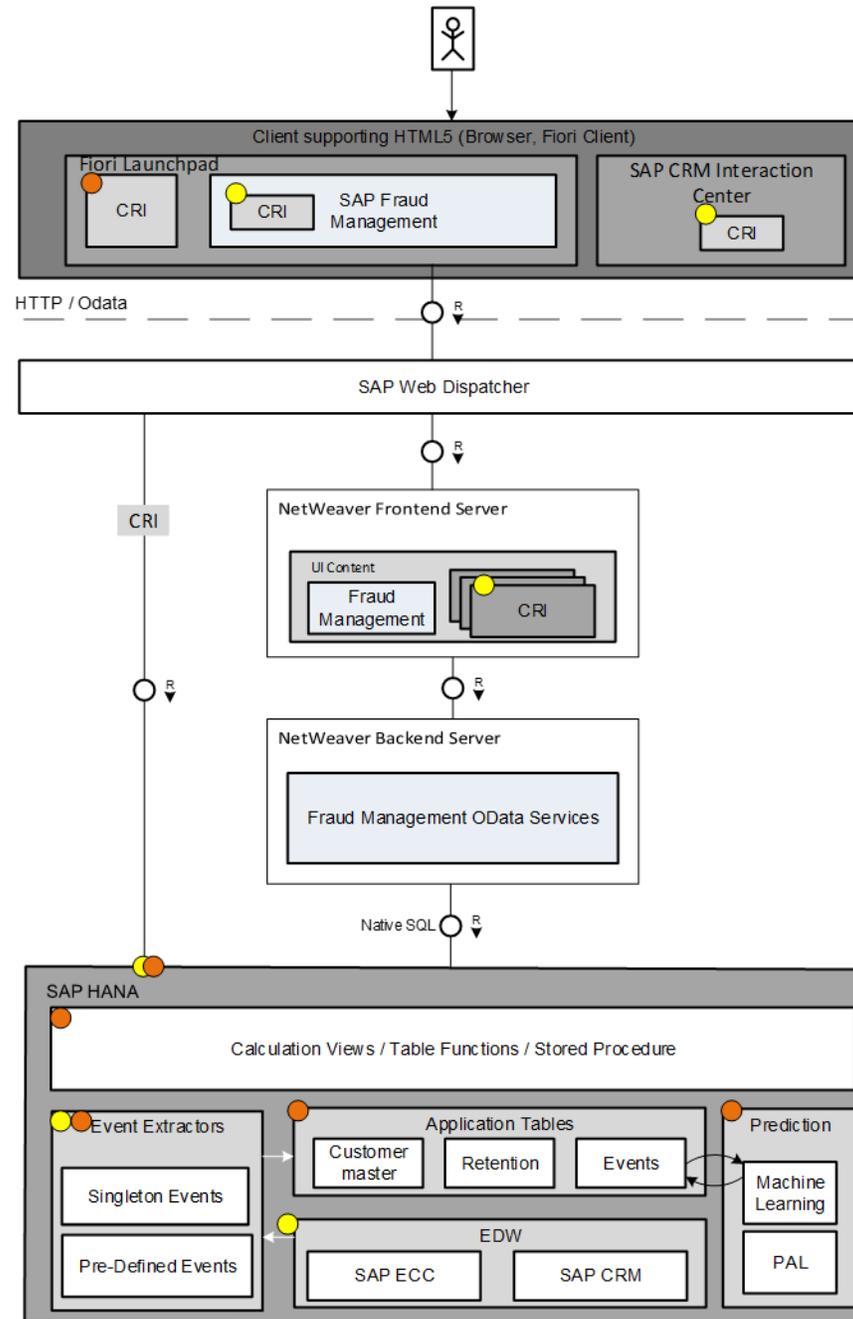
Illustration

The journey map instantly identifies the next best steps

This is a screenshot of the Taxpayer Journey screen. It presents a journey map of all of the touchpoint events in an individual taxpayer's interactions with OSR. Each dot represents an event with its associated machine-learning calculated risk score. As illustrated on this journey map by the events in highlighted in red, this specific land tax taxpayer has repeatedly undertaken high-risk, non compliant behaviour over the past 5 years. In this case, the taxpayer avoided their land tax obligations every year, until being issued with a legal notice. This indicates that this taxpayer may have had the capacity to pay, but has deliberately remained non-compliant. Armed with these powerful insights, OSR can now implement an action plan to prevent this taxpayer repeating these behaviours in future and ensure they pay their tax on time. Another example of customisation could be knowing that a one-off default is due to a natural disaster in the region of the taxpayer's home rather than active non-compliance. Machine learning capability enables us to proactively determine capacity vs willingness to pay on time by interpreting individual behaviour patterns in context with that taxpayer's specific circumstances.

Quotes

"In the midst of all the digital, people want a human connection and services that are proactive and personalised. The true value of SAP Leonardo machine learning capability is the insights it delivers that enrich our client's experience and create a client-centric environment for all taxpayers that will enable my office to realise better revenue outcomes for Queensland."

Elizabeth Goli
Commissioner of State Revenue, Queensland
(Chief Executive Officer, Office of State Revenue)

"The proof of concept exceeded our expectations, with the solution being able to predict 71 per cent of taxpayers who would ultimately default on their debt. By expanding the datasets to be used in production, we anticipate even greater accuracy and tax insights, and ultimately better outcomes for taxpayers and the revenue."

Simon McKee
Deputy Commissioner
(Digital Transformation Senior Executive Lead, Office of State Revenue)
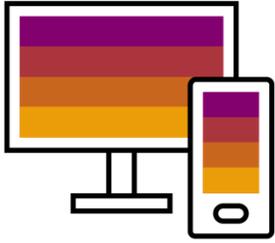
Deployment details

- Following the success of the SAP Leonardo Machine Learning Proof of Concept activity in 2017, OSR has partnered with SAP in 2018 to be the first public sector agency globally to implement Tax Insights powered by SAP Leonardo ML to transform its business.

- The application built on SAP Leonardo Machine Learning will be progressively rolled out across OSR to all tax lines, commencing July 2018 with the migration of the proof of concept for Land Tax into production.

- Planned enhancements to the proof of concept solution to be delivered as part of the production rollout include:

  - Extended internal and external data sets to expand the machine learning dataset to improve overall accuracy of prediction results;

  - Integration with SAP Fraud Management to factor risk scores into future compliance activities;

  - Integration with SAP Contact Centre and SAP CRM Interaction Centre to automatically display a taxpayer journey map on acceptance of an incoming call by a taxpayer into OSR;

  - Visualisation enhancements to the journey map to support easy recognition of the events that led up to the taxpayer defaulting;

  - Recommend next best action—the Machine Learning application will propose the next best approach, payment suggestion, or debt management procedure to best support a taxpayer to meet their obligations; and

  - Individual taxpayer risks, identified through the Machine Learning application, will also be leveraged through the future campaign processes that will be implemented as part of the Transformation Program through SAP Hybris Marketing, and will drive proactive taxpayer-specific messaging through the SAP Hybris Commerce portal, also scheduled to be implemented as part of our transformation.

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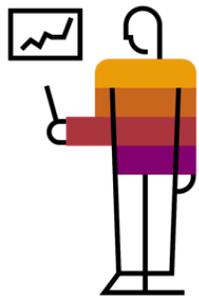
Additional information
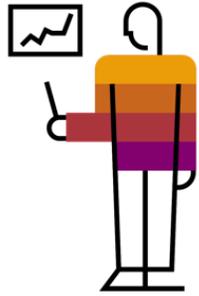
Additional information

Video on Transforming Taxpayer Services With Tax Insights powered by SAP Leonardo Machine Learning:

https://youtu.be/iib44I2fBj0