SAP® Innovation Awards 2020 Entry Pitch Deck
Revolutionize Internal Auditing Using SAP Data Intelligence
The Commonwealth of Pennsylvania
The Commonwealth of Pennsylvania was founded in 1681, in what is Pennsylvania’s’ current capital: Harrisburg. Today, the Commonwealth serves ~13 million citizens, employs 80,000+ people, and has 50+ agencies/departments. The Commonwealth’s annual spend including both state and federal budget for 2019-20 is $85.6 Billion.

Some of The Commonwealth’s 50+ agencies and departments include:

1. DMVA: Quality services for veterans and their families and oversees the Pennsylvania National Guard.
2. PDA: Ensures sustainable/safe/quality food and promotes farm viability.
3. DOH: Increases access to healthcare and helps with victims of the opioid epidemic.
4. DLI: Helps to build career pathways, a skilled workforce, and access to good jobs.
5. PDE: Provides access to high quality early education, supports high school graduates and post-secondary education.

The Commonwealth is currently focusing on digitizing citizen and business services in addition to modernizing existing platforms for internal users. Some of The Commonwealth’s initiatives are in the area of analytics, where vast amounts of data are quickly and efficiently analyzed via digital technologies for data management, machine learning and AI.
**Revolutionize Internal Auditing**

**The Commonwealth of Pennsylvania**

"The PoC provides an excellent business use case for supporting finance innovation by leveraging data analytics and emerging technologies in our day-to-day operations, and taking a risk-based approach to our business processes and services."

**Challenge**
- No single view visibility into total spend across multiple data sources.
- Significant manual efforts for internal auditing.
- No proactive audits based on intelligent insights.

**Solution**
- Live machine learning solution that provides a single view of global spend.
- The live machine learning solution also offers intelligent insights and areas of risk.

**Outcome**
- Identified $18.5B of potentially risky spend across 4 years and 3.9 million transactions. A total of $100B spend and $15M transactions were evaluated.
- The split transaction classifier performed at 99% accuracy compared to the existing rule-based approach.
- Delivered scope of analysis from The Commonwealth of Pennsylvania, to agency, then to document-level detail.

- **$18B** Potential risky transactions identified.
- **99%** Accuracy in identifying split transactions.
- **50** Users with single view of total spend.

Brian Lyman
Chief Accounting Officer,
Commonwealth of Pennsylvania
Participating Partner Information

TSC

Provided Industry Best Practices, Technical Expertise, Host PoC Landscape

“This PoC was a product of great collaboration between the Commonwealth, TSC, and SAP. In a way, the adoption of a risk-based approach towards a key business process was a groundbreaking initiative and not only gave the users the confidence in the digital tools, but also triggered the digital transformation journey for The Commonwealth”

Abhijit Umbarkar

CEO, TSC
Challenge:
The key business challenges for the Comptroller Operations and Bureau of Audit Commonwealth teams were data silos for financial transactions, including purchase card (p-card) transactions, grants, and contracts. These lead to a non-holistic view of total Commonwealth spend and lack of ability to effectively audit spend being constrained by manual process based on sampling of data. Most of the analytical reporting was ‘after-the-fact’ analysis, rather than reporting which provided intelligent insights for proactive actions. 

With shrinking budgets and reduced staff, one of the largest challenges facing the Commonwealth was obtaining actionable insights from the vast amount of data and being able to use those insights to proactively and effectively manage risk. In order to do so, not only did the Commonwealth need technology to supplement human efforts, but also needed to transform the overall business process.

Objective:
The Commonwealth of Pennsylvania conducted a design thinking workshop in order to discuss the project challenges with the goal of producing the vision and plan to address them. The Commonwealth decided to create an analytical risk-based model for the audit process, which would provide insights into global spend and highlight risk.

The Commonwealth broke down data siloes and united transactions by analyzing structured, unstructured, and cloud application data across all internal components. This provided improved spend visibility.

With this approach, The Commonwealth aimed to make the newly implemented audit process proactively identify audit candidates with qualitative risk scores, total likelihood, and impact.
Project or Use Case Details

The Commonwealth of Pennsylvania used machine learning (ML) and AI technology to move away from audit sampling and towards intelligent data insights. The ML and AI technologies helped review all transactions and were able to provide The Commonwealth with exceptions and critical issues that needed to be reviewed and addressed.

The Commonwealth leveraged SAP Data Hub Pipeline Modeler to automate data orchestration across multiple sources. The SAP Data Hub Pipeline Modelers were also used in conjunction with ML operators to predict split transactions. The Commonwealth then used the text analyzer feature for extracting summarized budget category data out of PDF files for grant contracts.

In order to develop this solution, The Commonwealth used 4 years of SAP financial and procurement data coupled with transactional p-card and PDF-formatted grant contract data. 15 million transactions across a $100 billion spend were then used to create business rules for identifying potentially risky transactions. At the same time, a second set of rules was created for identifying p-card split transactions that would be considered risky. These transactions were then used to rank agencies using a risk score. The risk scores would later be used to score transactions and flag them for additional audit/review.

An agencies’ risk score was calculated based on:
1. Likelihood (Number of transactions)
2. Impact ($ value of transactions)
3. Weighted Likelihood (Number of transactions / all agency transactions)
4. Weighted Impact ($ value of transactions / total $ value of agency transactions)
## Benefits and Outcomes

### Business or Social
- Single view for global spend across Commonwealth of Pennsylvania.
- Complete identification of all Split Transactions for P-Cards.
- Accurately identify all potentially risky transactions across Commonwealth of Pennsylvania.
- Implement action plan for reducing the compliance risk.

### IT
- Remove Data Silos.
- Manage and orchestrate data across SAP and non-SAP systems.
- Analyze structured and unstructured data within the same platform.
- Support business needs.
- Use of digital technologies for data management, machine learning, and AI.

### Human Empowerment
- Empower staff to ensure compliance with policy.
- Provide actionable insights.
- More time allotted for effective execution of action, rather than performing investigation.
- Create a workforce equipped with exceptional digital technology skills.
## Deployment

### Deployment status
POC

### Date
Planned Go-Live Date
June 2020

### Number of users
50

### SAP technologies used:

<table>
<thead>
<tr>
<th>SAP product</th>
<th>Deployment status (live or proof of concept [POC])</th>
<th>Contribution to project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SAP Data Intelligence</td>
<td>POC</td>
<td>Data Management, orchestration, text analysis.</td>
</tr>
<tr>
<td>2 SAP Business Suite powered by SAP HANA</td>
<td>Live</td>
<td>Operational efficiency.</td>
</tr>
<tr>
<td>3 SAP HANA</td>
<td>Live</td>
<td>Database/platform needed to use all of the above.</td>
</tr>
<tr>
<td>4</td>
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</table>

If you have used one of the services or support offerings from SAP Digital Business Services during the implementation or deployment phase, please select with [X] one or more of the following offerings:

- [ ] SAP MaxAttention™
- [ ] SAP Value Assurance
- [ ] SAP Innovation Services
- [ ] SAP ActiveAttention™
- [ ] SAP Model Company
- [ ] SAP Advanced Deployment
- [ ] Others:
  - [ ] SAP Innovative Business Solutions
The following **advanced technologies** were part of the project.

<table>
<thead>
<tr>
<th>Technology or use case</th>
<th>Yes or No</th>
<th>Contribution to project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Data Management / Orchestration</td>
<td>Yes</td>
<td>Remove data silos and provide a single platform for data analysis.</td>
</tr>
<tr>
<td>2 Blockchain</td>
<td></td>
<td></td>
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<tr>
<td>3 Internet of Things (IoT)</td>
<td></td>
<td></td>
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<tr>
<td>4 Machine learning or AI</td>
<td>Yes</td>
<td>Provide intelligent insights into the data spanning millions of transactions and billions of dollars.</td>
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<td>5 Conversational AI</td>
<td></td>
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<td>6 Robotic process automation</td>
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<tr>
<td>7 Data anonymization</td>
<td>Yes</td>
<td>Prevent access to sensitive vendor information such as TIN / SSN.</td>
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