TEI / SJSU – High Tech Tax Institute

Tax Automation Discussion
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Panelists

- Andy Ruggles – Partner, PwC (Moderator)
  National Practice Leader, Tax Reporting & Strategy
- Danyle Ordway – Partner, EY
  Tax Technology and Data Analytics
- John Viglione – Executive VP, Vertex
- Rafiq Jalal – Managing Director, KPMG
  Tax Technology
**Agenda**

- Trends in tax technology and operations
- Robotics in tax
- Perspective from tax technology vendor (Vertex)
- AI, Analytics and emerging technology
- Getting started

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**Trends in tax technology**
**Tax Technology and Operations - Key trends**

- Tax Functions are re-evaluating their **target operating model** - is the tax function fit for purpose?
- Tax Functions are focused on **reducing cost, increasing value, and managing risk**
- Tax transformation is focused on **targeted solutions via proof of concepts** and quick wins, as part of its broader transformation strategy
- Automation has rapidly evolved but may **differ across functional areas**
- Finance **moving to the cloud** for enterprise systems provides significant opportunity as finance transformations occur
- Robotcs is creating a **new digital labor force** for global tax functions
- Tax functions are developing capabilities around **Tax Authorities’ transparency requirements**
  - US Tax Reform will have significant impact on today’s execution

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**Tax Reporting & Strategy - Tax Ecosystem**

- **Enterprise systems**
- **ETL / data hub**
- **Tax applications**
- **Key deliverables**
- **Business intelligence and analytics**
- **RPA / Digital labor**
  - Automated tax operations management
  - **Tax**
  - **Finance**
  - **Third parties**
Disrupt or be disrupted?
Headlines capturing attention of executives everywhere

30%–40% of existing business process services are likely to be impacted by RPA

Cost reduction of 35%–65% for onshore operations and 10-30% for offshore operations

RPA is estimated to lead to 30%–35% reduction in entry level roles and increase mid level roles

Estimated that 85% of a typical firm’s 900+ processes can be automated. 110 to 140m FTEs could be replaced by 2025
The big picture of Intelligent Automation

RPA is an innovative solution for a fully automatic handling of business processes with high volume repetition

What is RPA?

RPA simulates an employee.

The software robot has access to diverse applications with an ID or a password. The robot can gather information or change data. Consequently, business and administrative processes can be fully automated.

RPA is software.

RPA is a computer software that runs repetitive, rule-based processes. The software is trained based on functional specifications and can be adjusted at any time.

RPA is integrated in an existing IT infrastructure.

As a renewal of the existing IT landscape is not required, a high level of automation can be reached without major effort. RPA uses established control mechanisms and can communicate with all systems. Therefore, no interface has to be created.

“Robots deliver repetitive, deterministic, high-volume tasks efficiently, quickly, and consistently. People build relationships, provide subjective judgement, deliver low-frequency tasks, and manage change and improvement.”

Definition: Robotic Process Automation (RPA)

Is the application of a cost-effective software that mimics human action and connects multiple fragmented systems together through automation without changing the current enterprise IT landscape.
Case study: Tax provision reporting

The challenge
- Numerous tax provision reports generated from ONESOURCE Tax Provision (OTP) are used by the tax departments during the period close cycle.
- Data frequently changes, so the reports must be re-run. Delay in getting the reports to the department has adverse effect on meeting the critical close cycle deadline.

Why automation
- During critical quarterly and annual close periods, tax professionals constantly need to run and format reports during the review of the provision, interim provision and estimated payment data.
- This is time-consuming and the reports are prone to errors, if they are done manually.

What we did
- Used Blue Prism RPA tool to generate tax provision reports from ONESOURCE Tax Provision.
- The key steps below:

Outcome
- Significant time savings, increased speed, accuracy and efficiency (less manual keying of data)
- Teams spent more time on review and less time on preparation (better leverage of knowledge worker skills)
- Reduced labor cost
- Reduced human errors

Winning with data and analytics
Investing in the human element

Behavioral alignment
(Analytics ‘consumption’)
- Culture and leadership
- Organization and process design
- Learning and development
- Incentives/rewards

Technical capability
(Analytics ‘production’)
- Data science
- Data quality
- Infrastructure and tools

Select survey findings:
- % of organizations that agree analytics is changing the nature of competitive advantage? 78%
- % of organizations that are investing $5 66%
- % of organizations that describe their analytics maturity as leading? 12%
- % of organizations that agree that change management is a significant barrier to realizing value? 89%
## Content Management & Data Analytics
### KPIs – Overall discussion

### Tax controversy
- The number and amount of penalties paid on VAT/GST assessments
- The number of unanticipated audit challenges/assessments from the tax authorities
- The cost of audit defense (internal and external)
- Status of the open tax audits – i.e., duration, average of open days, risk, settled x assessed

### Tax accounting
- The degree of automation of the end-to-end tax process
- The percentage of VAT/GST posting errors (AR and AP)
- VAT/GST invoicing errors (e.g., percentage of invoices returned by suppliers)
- The cost of producing an invoice
- The cost of VAT due to DSO/DPO

### Tax compliance
- The number and frequency of corrected filings
- Average VAT paid by period vs. significant changes
- Status of open returns – i.e., number of returns not filled
- AP balance, by business and aging - how old are AP VAT credits?
- The number and amount of penalties for either correcting filings or making formal disclosures
- The number and frequency of formal disclosures – i.e., corrections that are separately disclosed to the authorities as opposed to amending/correcting a return
- The cost of return preparation – the number of full-time equivalents spent on VAT compliance and outsourcing
- The percentage of filings on time vs. number of penalties and amount for late filings and/or payment

### Tax management
- The number of full-time equivalents (FTEs) dedicated to indirect tax
- The percentage of tax department resources dedicated to indirect tax
- Status of the closed tax audits – i.e., number of closed per year, period
- Control of open and closed tax audits – i.e., Excel spreadsheet, manually, electronic audit software

### Tax planning
- The amount of VAT/GST under management – in key jurisdictions
- Monthly/quarterly VAT/GST working capital requirements

### Digital tax maturity model
#### Data and analytics

<table>
<thead>
<tr>
<th>Basic - 1</th>
<th>Developing - 2</th>
<th>Established - 3</th>
<th>Advanced - 4</th>
<th>Leading - 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does the tax function have tax sensitive data at the right level?</strong></td>
<td>Financial systems do not provide ease of access to tax sensitized data and reporting and retention. There is no tax data management strategy in place.</td>
<td>Financial systems are limited in meeting tax data and reporting needs. Inefficient and manual manipulation is needed to collect, reconcile and adjust for each tax process.</td>
<td>Financial systems provide tax sensitized data and reporting; however, mix of automated and manual effort to collect, reconcile and adjust the data into a useable format for each tax process.</td>
<td>Financial systems provide tax sensitized data and reporting; however, mix of automated and manual effort to collect, reconcile and adjust the data into a centralized and re-useable format that is leveraged across tax processes.</td>
</tr>
<tr>
<td><strong>Does the tax function utilize data analytics to manage risk and deliver value?</strong></td>
<td>Ad hoc analysis performed on a limited basis and with very little re-usability period over period.</td>
<td>No formal data analytics but regularly perform comparisons to prior period, variance analysis, etc. in Excel workpapers.</td>
<td>Formal data analytics strategy in place with standard Excel templates in place. Supports some discrete tax planning, reporting, compliance and audit processes.</td>
<td>Formal data analytics strategy and use of visualization tool(s) in which the user can interact. Enables standard set of analytics across most tax processes with drill down capability.</td>
</tr>
</tbody>
</table>
Perspectives from Vertex / tax technology vendor
Tax Technology Design Considerations

Digital Transparent Intelligent
Inclusive Discoverable Augmentative

Digital Fuel
Global Security
Transaction Level
Cloud to Edge
Emerging technology – AI, Blockchain, and Data
Database

A database is an organized collection of data. It is the collection of schemas, tables, queries, reports, views and other objects. The data are typically organized to model aspects of reality in a way that supports processes requiring information.

Example 1: Relational Database

<table>
<thead>
<tr>
<th>Activity code</th>
<th>Activity name</th>
<th>Date</th>
<th>Route no.</th>
</tr>
</thead>
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<td>23</td>
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<td>01/12/01</td>
<td>1-95</td>
</tr>
<tr>
<td>24</td>
<td>Overlay</td>
<td>01/15/01</td>
<td>1-495</td>
</tr>
<tr>
<td>25</td>
<td>Crack sealing</td>
<td>02/08/01</td>
<td>1-66</td>
</tr>
</tbody>
</table>

SQL Server
Oracle
MySQL

Example 2: NoSQL Database

<table>
<thead>
<tr>
<th>Activity code</th>
<th>Date</th>
<th>Route no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key = 24</td>
<td>01/12/01</td>
<td>1-95</td>
</tr>
<tr>
<td>Key = 24</td>
<td>02/08/01</td>
<td>1-66</td>
</tr>
</tbody>
</table>

Key-value

Column-family

Redis
Neo4j
Cassandra
Mongodb

Analytics

Analytics is the systematic application of any range of data analysis techniques designed to find and explain meaningful patterns in data. Organizations apply analytics to business data to describe, predict, and improve business performance.

Skills Level

Why did it happen?
What is happening?
What is likely to happen?
What should I do about it?

Descriptive
Discovery
Predictive
Prescriptive

Value
Hindsight
Insight
Foresight
Big Data
Big data is a broad term for data sets so large or complex that traditional data processing applications are inadequate.

Challenges

Volume
World Wide Web has 4.8 billion pages.

Value
Google processes 2.3 million searches every second. How to explore the trending search topics?

Veracity
How to merge data drawn from text, images, audio, video and complete missing pieces through data fusion?

Velocity
Facebook processes 105 terabytes of data every half an hour.

Variety
Data types can be numbers, words, images, maps, networks, etc...

Veracity
How to merge data drawn from text, images, audio, video and complete missing pieces through data fusion?

Value
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Cloud Computing
Cloud computing is the delivery of computing services—servers, storage, databases, networking, software, analytics, and more—over the Internet (“the cloud”).

Cloud ≠ Data Center
The "4th industrial revolution" (cyber-physical systems) is beginning...and its impact is profound, according to the World Economic Forum founder, Klaus Schwab.
Intelligent automation impact

$152B+

The expected market size for intelligent automation by 2020*

ROI between 600 – 800%*

45% of activities individuals currently perform in the workplace can be automated using existing technologies*

* Bank of America Merrill Lynch, November 2015
* London School of Economics, The IT Function and Robotic Process Automation, October 2015

ACT

like a human

Basic process automation
- Macro-based applets
- Screen level and OCR data collection
- Workflow automation
- Process mapping
- Self executing

RULES

LEARN

REASON

THINK

like a human

Enhanced automation
- Built-in knowledge repository
- Learning capabilities
- Ability to work with unstructured data
- Pattern recognition
- Reading source data manuals
- Natural language processing

Cognitive automation
- Artificial intelligence
- Natural language recognition and processing
- Self-learning (sometimes self optimizing)
- Processing of super data sets
- Predictive analytics/hypothesis generation
- Evidence-based learning
AI refers to ‘Artificial Intelligence’ which means making machines capable to perform intelligent tasks like human beings. AI performs automated tasks using intelligence.
Areas of AI

Automated

- Deterministic Rules & Processing Decisions
- Event Processing
- Natural Language Processing
- Predictive Knowledge Management

Intelligence

- Machine Learning
  - Unsupervised Learning
  - Reinforced Learning
  - Supervised Learning
  - Deep NN Learning
  - Classic Models (Bayes, Regression trees, etc.)

Key points

Data, data and more data
The need for large volumes of data is paramount. All cognitive systems trained through consumption of large volumes of data, to see patterns and connections. This takes time and effort, prior to system being ready for production.

Quality of data becomes critical. When dealing with documents that originate on paper and are then scanned, the quality of scanning will directly impact how the system can recognize text and read it. This is a catalyst for change and will add another lever for the industry to move towards electronic records, similar to how the medical profession has moved to Electronic Medical Records.

Cognitive Systems can (and will) make mistakes
Much like a human being, the system learns through experience and gets increasingly better with time. However, just like a human being, it is often impossible to reach an answer with 100% certainty. Cognitive systems will provide the confidence level of its answer and it will be up to us to determine the usefulness of the evidence.

Extendible, but incrementally so
Because training of a cognitive system is a tremendous effort, it is almost always the right approach to use as narrow of a field as possible. This limits the amount of training required and allows the system to show benefits much sooner.
A combined approach for tax

Visualizations for quick, powerful, and flexible analysis

Intelligent Automation for the repetitive, defined processes - crossing systems, pulling data, running reports

Data tools for complex formatting, compiling, and calculating

People throughout: reviewing, monitoring, planning, innovating

How will your tax function evolve?
Considerations in getting started
**Tax Department Service Model Spectrum**

<table>
<thead>
<tr>
<th>Internal</th>
<th>Selected outsourcing</th>
<th>Co-sourcing arrangements</th>
<th>Fully outsourced compliance</th>
<th>Managed Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-house tax function</td>
<td>Collaborate with external resources on certain tax functions</td>
<td>Leverage external expertise to manage co-sourcing operations and assist with acute tax issues and consulting</td>
<td>Fully leverage service providers in fulfilling tax compliance obligations</td>
<td>Realize cost savings by consolidating tax expenditures to one dedicated service provider while retaining “in-house” approach</td>
</tr>
<tr>
<td>Significant investment of time and capital</td>
<td>Outsource strategic components of the tax function where either capacity or internal knowledge does not exist</td>
<td>Leverage outside expertise on specific tax technical areas</td>
<td>Allow internal resources to perform higher value activities such as strategic planning</td>
<td>A tax function of the future model that comprehensively delivers tax needs</td>
</tr>
<tr>
<td>Sole reliance on internal resources and expertise</td>
<td>Minimize in-house tax department to critical or highly sensitive areas</td>
<td>Retain in-house tax expertise to manage co-sourcing operations and assist with acute tax issues and consulting</td>
<td>Reduce significant risks associated with global tax compliance</td>
<td>World-class talent utilizing leading tax technologies</td>
</tr>
<tr>
<td>Limited resources available for internal consulting project</td>
<td>Leverage external technology platforms to reduce internal spend</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inability to leverage external technology applications</td>
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**Getting Started**

- Strategy design – what is the best starting point?
- Business case – what are best practices?
- Getting started – what are organizations doing?
Tax Function of the Future series

To download our publications in the Tax Function of the Future series visit:

pwc.com/us/futureoftax