NASACT Webinar - Smarter Finance, Better Government

March 14, 2018

Bob Sabo, ERP/EPM Cloud Strategic Programs Director – Oracle

Mark Rakhmilevich, Senior Director, Blockchain Product Management, Oracle

Craig Fischer, Program Manager, Office of Financial Innovation and Transformation (FIT), Bureau of Fiscal Service, U.S. Department of the Treasury
Opening Remarks

Moderator
Kinney Poynter
Executive Director
NASACT

Speaker
Bob Sabo
ERP/EPM Cloud Strategic Programs Director
Oracle

Speaker
Mark Rakhmilevich
Senior Director, Blockchain Product Management
Oracle

Speaker
Craig Fischer
Program Manager, FIT, Bureau of Fiscal Service
U.S. Dept. of the Treasury
Safe Harbor Statement

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Program Agenda

1. Welcome and Introduction – Kinney Pointer, Executive Director, NASACT
2. The Changing World of Finance – Bob Sabo, Oracle
3. Leveraging Blockchain in the Public Sector – Mark Rakhmilevich, Oracle
5. Questions and Answers
Bob Sabo

ERP/EPM Cloud Strategic Programs Director

Wilton, CT

22 years with Oracle Public Sector
10 years with Government
Former City Manager

Bob Sabo
THE FUTURE IS HERE
ARE YOU READY?
GOVERNMENT and BUSINESS IS CHANGING

Organizational Challenges
New citizens/customer expectations. Disruption in traditional IT/Finance system models.

INNOVATION
Digital transformation. Emerging technologies: AI, IoT, Big Data, Chatbots, RPA, Touchless Processing, Blockchain

AGILITY
Continuous innovation. Intelligence-driven, connected outcomes. Better services to citizens at lower cost.

78%
Percentage of current workforce is mostly transactional

Source: Assn. of Government Accountants Annual CFO Survey – Navigating Disruption. January 2018
ORGANIZATIONS ARE CHANGING

WHO

WHY
Intelligent process automation eliminating routine work. Information-rich collaboration.

FOCUS
Accuracy, speed & compliance. Social connection. Authenticity & simplicity.

48%
CxOs will take action in the next year to automate admin & low skill roles

Source: Unified Finance and HR: The Cloud’s New Power Partnership
MIT Custom/Oracle 2017
THE CFO’S ROLE IS CHANGING

LEADERSHIP

FOCUS

STRUCTURE

NASCIO
Source: NASCIO 2018 report on top CIO priorities
3 of 4 Top Priorities
• Security
• Cloud
• Digital Transformation

THE CFO’S ROLE IS CHANGING

LEADERSHIP

FOCUS

STRUCTURE

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STRUCTURE

THE CFO’S ROLE IS CHANGING

LEADERSHIP

FOCUS

STRUCTURE
FINANCE LEADERS ARE RESPONDING

FROM
MANAGING TO BUDGET
EFFICIENCY
CONTROL
DATA & INFORMATION
PROCESS EXECUTION
ADVISOR
DISPARATE SYSTEMS

TO
MEANINGFUL INSIGHTS
EFFICIENCY & AGILITY
CONTROL & INNOVATION
PREDICTIVE ANALYTICAL INFORMATION
INTELLIGENT AUTOMATION
INFLUENCER
PLATFORM
YESTERDAY’S ERP ISN’T ENOUGH

The transformational potential of AI in financial management applications will come in the next two to three years as more AI technologies are embedded directly into financial management processes to automate complex, non-routine activities with little or no human intervention. Also, using AI to improve the accuracy and effectiveness of financial forecasting and planning will transform these processes.”


By 2021, more than 50% of enterprises will spend more per annum on bots and chatbot creation than traditional mobile app development.

Gartner Top Strategic Predictions for 2018, October 2017

Blockchain and distributed ledger technology will transform the delivery of public and private services, redefine the relationship between government and the citizen in terms of data sharing, transparency and trust, and fundamentally improve the delivery of government services. State of Illinois

“Blockchain technology holds great promise for the financial industry, in terms of security and verifiability of transactions in real time and in terms of increased efficiency and new capabilities to transact business across the globe” Kristopher Knight, Deputy Secretary of State - Delaware.
EMERGING TECHNOLOGIES ARE CREATING NEW OPPORTUNITIES AND CHANGING THE WAY GOVERNMENT WORKS

Artificial Intelligence / Machine Learning
Blockchain
Autonomous Software
IoT
Human Interface/Voice Interactive
The need to create tomorrow’s finance function is accelerating.

Constraints

I.T. Infrastructure

Data

Processes

People & Culture

Operating Model

Sustainability

Brand Reputation

Security

Compliance

Talent

Competition

Customer expectations

Innovation

Technology Convergence

Time

The Pace of Change

Ability to Respond

Change

CONTRAINTS

Source: Oracle, 2017
DELIVERING NEW TECHNOLOGIES TO REVOLUTIONIZE FINANCE

- Artificial Intelligence
- Human Interface
- Internet of Things
- Blockchain
- Machine Learning
- RPA
UNLEASH INNOVATION

Connected intelligent cloud suites will drive sustained transformation

“The human interface” will change the way we interact with systems

Mundane Tasks will be automated (e.g. Robotic Process automation)

Human capabilities will be augmented with AI (ML / AI - e.g. Augmented CFO)

More data is better. In-house data and acquired data drive differentiation.

New roles emerging (e.g. CDO - Chief Data Officer, Chief Insight Officer)
PERVASIVE AI AMPLIFIES HUMAN ABILITIES

Software that learns from you and adjusts to you

Automate non-value add activities that machines are better at

Decision support through intelligence augmentation

Elevate your employees to become smarter strategic drivers
THE HUMAN INTERFACE
DESIGNED AROUND YOU

CONVERSATIONAL
Voice, Chatbots

ADAPTIVE
Software that learns from you

VISUAL
Delightful experiences
INTERNET-OF-THINGS
DESIGNED FOR SIMPLICITY

IMPACTFUL
Impact your business processes through IoT data from connected assets

SMART
Predictive, Machine learning algorithms

CONNECTED
Into Business Apps to optimize workflows
REVOLUTIONIZING COMMON PROCESSES
PERIOD CLOSE TO FINANCIAL REPORTS - NOW

- Close Subledgers
- Pro-Forma Close Ledgers
- Review and Confirm Financial and Management Reports
- Reconcile Accounts
- Consolidate Component Units
- Publish and Securely Share Financial Statements
- Update Financial Forecasts
- Close Ledgers
AI: BUSINESS PROCESSES REVOLUTIONIZED
PERIOD CLOSE TO FINANCIAL REPORTS – OUR PREDICTION

Continuous Virtual Close

Manage Exceptions & Reviews

Close & Securely Publish

Source: Oracle, 2017
TECHNOLOGY DRIVES NEW BUSINESS MODELS
Blockchain for Public Sector Organizations

Mark Rakhmilevich
Senior Director
Blockchain Product Management
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The Promise of Blockchain

"The technology most likely to change the next decade of business is not the social web, big data, the cloud, robotics, or even artificial intelligence. It's the blockchain..."

—Harvard Business Review
"The Impact of Blockchain Goes Beyond Financial Services," May 2016

"$176 billion in added business value by 2025; that total reaches $3.1 trillion by 2030."

Gartner

"More than 2,500 patents have been filed in the last 3 years."

The World Bank
What is Blockchain

- System for maintaining distributed ledgers in a peer-to-peer network
- Allows multiple parties that may not fully trust one another to do business securely
- Reduces need for third-party intermediaries
- Near real-time and unalterable records replicated among all participants
Key Components of a Blockchain System

Applications
- Register users
- Invoke smart contracts to update or query data
- Consume events

Smart Contracts
- Business logic to update the ledger
- Query data
- Publish events

Blockchain Infrastructure
- Network of validating nodes
- Distributed Ledger
- Membership services
Four Key Properties of Blockchains

• Shared & Transparent Data Access
• Immutable/Tamper-evident Ledger
• Validated/Non-Repudiable Transactions
• Confidential Records and Transactions
Two Types of Blockchain

• Public (a.k.a. “Permissionless”)
  – Anyone can join the network and have a copy of the ledger
  – E.g., Bitcoin, Ethereum
  – This involves the computer resource intensive mining process to add blocks cryptographically
  – Consensus models based on computationally expensive algorithms requiring the processing power of many nodes to ensure security.

• Permissioned
  – Closed ecosystem: members are invited to join and keep a copy of the ledger
  – Who members are in the real (legal) world is known (to at least the operators of the blockchain, but not necessarily all participants)
  – E.g., Chain, R3 Corda, Hyperledger Fabric
  – Consensus protocols depend on knowing who the members are, e.g., PBFT, for greater scalability
  – Two subtypes:
    • Consortium: multiple organizations or departments
    • Private: single organization (prototypes, pilots)
Disruptive Characteristics/Benefits of Blockchain

• **Decentralized, peer-to-peer network** – No central, controlling authority
  
  Eliminating intermediaries means reduced transaction costs and near real-time transaction execution

• **Distributed ledger** – All participants maintain a copy of the ledger
  
  Eliminates manual efforts and delays due to reconciliation needs since data consistency is a key attribute of the distributed ledger

• **Immutable transaction history** – Impossible to make changes to existing transactions in a blockchain without detection
  
  Increased confidence in the information and reduced fraud opportunities

• **Smart contracts** – Business logic deployed on a blockchain and shared and validated by participants.
  
  Automated business processes in a trusted way. Represent any asset digitally.

• **Transparent** – Transactions on a blockchain are visible to the authorized participants.
  
  Increased auditability and trust, reduce cost of fraud and audits
Blockchain Opportunities

Challenges At the Enterprise Boundary

• Enabling trust in peer-to-peer B2B/G2B transactions, avoiding the cost and risks of intermediaries
• Manual, error-prone information exchange and processes across enterprise boundaries
• High cost and delays of offline reconciliations
• Settlement risk and poor auditability of records due to cross-ERP discrepancies
• High risk & cost of fraud in cross-company transactions
• Lack of real-time information visibility within a trading ecosystem
Similar Problems Exist Inside Enterprise

- Multiple silos of ERP or SOR systems
- Intercompany processing between multiple entities
- Lack of real-time information visibility between divisions or units in different countries or provinces
- Easier to tackle internal challenges first before trying to deal with other companies
What You Can Use Blockchain For?

- Enable distributed, autonomous marketplaces
- Reduce friction in business transactions and reconciliations
- Securely maintain and share decentralized records
- Track the provenance of documents, products, materials..
Distributed Autonomous Marketplace
Exchange Things of Value

Invoice Factoring Marketplace with verified invoices from ERP Systems

Ace Supplier

BlockChain Marketplace

Financial Services

Vision Enterprise
Reduce Friction in Business Transactions
Replace Offline Reconciliation

Track and Reconcile POs, Invoices, Shipping Notices, Delivery Receipts

Automatic enforcement of contract terms, SLAs, ratings, 3-way matching using smart contracts
Securely Maintain and Share Records
Ownership verification, licenses, certificates, ...

Management of education and employment records
Track the Provenance: Products, Materials
Food, drugs, high value parts, construction materials...

Food provenance tracking: Farm to Table

1. GrassRoots → Request certificate → USDA reviews audit report → Award certificate → GrassRoots
   - GrassRoots
   - USDA
   - GrassRoots

2. GrassRoots → Issue Purchase Order → Mindful Meats processes meat → Issue Purchase Order → Whole Foods
   - GrassRoots
   - Mindful Meats
   - Whole Foods

3. Consumer sees product details at POS
   - Consumer

Legend
- Supplier
- Processor
- Retailer
- Certificate authority
- Consumer

Presented by AXIOM Technologies at OOW 2017
Blockchain Conversations in Financial Services

Payments
- Intra-Bank Cross Border Payments/Remittances
- Inter-Bank National Payments
- Brokerage account payment transactions
- Corporate B2B Payments
- FX documentation & FX netting across entities of a global bank

Trade
- Cross-Border Loans for handling Buyer’s Credit
- Bank-to-Customer Trade Transactions
  - Supplier / Vendor Finance, Invoice Factoring
- Full Trade Lifecycle management from Issuance to Presentation and Settlement

Securitization
- Mortgage & loan securitization, value updates
- Real-estate SPV securitization and investment management

Customer On-boarding/KYC
- Onboarding document exchange/signing/updates
- KYC/AML utility & certifications of 3rd party checks
- Customer’s visibility into bank employees access to sensitive data

Lending/Credit Advances
- Transformational lending models incorporating trusted GL feeds from Financials/ERP systems
Blockchain Conversations in Public Sector

Government Records
- Birth and death certificates
- Licenses
- Property ownership (land titles & deeds, cars, yachts, planes, etc.)
- Driver licenses
- University transcripts/degree certifications
- “KYC” for security-cleared employees

Regulatory Certifications
- Food genealogy and provenance tracing
- Pharmaceuticals production & importation

Procurement
- Bids transparency and tracking
- Fulfillment tracking linked to bids

Citizen Services
- Taxes across jurisdictions
- Benefits/welfare digital wallets
- Citizen records updates for multiple jurisdictions

Customs
- Customs documentation, certifications
- Taxes & dues
- Inspection reports
### Other Use Cases: Healthcare, Supply Chain...

<table>
<thead>
<tr>
<th><strong>Healthcare</strong></th>
<th><strong>Supply Chain</strong></th>
<th><strong>Others</strong></th>
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<tbody>
<tr>
<td>- Electronic Health Record secure storage and sharing</td>
<td>- Genealogy and traceability of parts, components, ingredients in Life Sciences, Food &amp; Beverage, Electronics, Automotive through electronic records</td>
<td>- Baggage tracing across connections</td>
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<tr>
<td>- Service provider credential management</td>
<td>- Farm-to-table food provenance</td>
<td>- Loyalty programs for associations of SMEs</td>
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<tr>
<td>- Clinical trials: store trial results in a tamper proof way</td>
<td>- Country of origin traceability</td>
<td>- Tamper-proof IoT sensor data, non-repudiation of monitored activities</td>
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<tr>
<td>- Anti-counterfeit tracking for pharmaceuticals</td>
<td>- Electronic compliance records</td>
<td>- Quality control records</td>
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<tr>
<td>- Integration with IoT devices monitoring health</td>
<td>- Quality control records</td>
<td>- Baggage tracing across connections</td>
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Four Ways for Public Agencies to Leverage Blockchain

Maintainer of single source of truth for public records
- Export licenses
- Certifications
- RFPs and Awards

As a Business, conducting business transactions
- Procurement/Supply Chain
- Parts tracking & maintenance records
- Payments, reconciliations

As a Regulator, enforcing and auditing industry
- SEC tracking of markets activity
- FDA anti-counterfeit drugs tracking
- Infrastructure spending, grants, etc.

Inter-Agency reconciliation, accounts updates, records sharing
- Debt Collections
- Watch lists
- Security clearances
Business Value

• Increase business velocity by accelerating transactions, enabling new business models and revenue streams
  • Automate multi-party business processes
  • Reduce cost and risk of using intermediaries
  • Reduce cost of fraud and regulatory compliance
  • Improve data quality and timeliness by avoiding offline reconciliation and manual exception handling
  • Increase auditability and trust, reduce audit costs
Why Is Blockchain Hard to Implement?

**NO PLUG N PLAY FOR ENTERPRISES**
- Closed ERPs, one-off integrations, complex APIs

**INSUFFICIENT PRODUCTION READINESS**
- Resilience, security, recoverability, global reach

**CONTINUOUS PLATFORM EVOLUTION**
- Rapid technology changes, lack of backward compatibility

**OPERATIONAL CHALLENGES**
- Member on-boarding, monitoring, supportability, lifecycle management, and limited scalability
Oracle Strategy

• Deliver Enterprise-Grade Blockchain Cloud Platform
• Help Customers In Many Industries Adopt Blockchain and Distributed Ledgers
• Enable Rapid Experimentation and Production-Readiness
• Simplify Integration to Accelerate Blockchain Use in SaaS and PaaS Applications
• Leverage Oracle IP and Open Source to Advance the Enterprise Blockchain Capabilities
Oracle Blockchain Cloud Service

Securely, reliably extend business processes and accelerate B2B transactions

PRE-ASSEMBLED MANAGED PAAS
- Rapid, global provisioning & simplified operations
- Outsource risk as early standards evolve

EXTENDS ENTERPRISE BOUNDARIES
- Integration with Oracle SaaS and PaaS, and customer apps in cloud and on premises
- OOTB support for Netsuite, Open Banking Platform

RESILIENT, ENTERPRISE-GRADE PLATFORM
- Secure and confidential permissioned blockchain with built-in monitoring and autonomous recovery
- Data at rest encryption and continuous ledger backup
Oracle Blockchain Service Architecture

Industrialized Blockchain cloud platform for enterprise

Pre-assembled | Managed service | Production-ready | Public or private cloud

REST APIs for Integrations

Administration
Dynamic Configuration, Monitoring and Troubleshooting

Blockchain Nodes & Containers
Peer Nodes, Smart Contract Containers, Membership Services, Ordering Service, REST Proxy

Data Services
Object Store CS

Infrastructure and PaaS Services
Application Container CS (Managed Docker Containers), Identity CS (identity and key mgmt), Event Hub CS (Kafka service), Management Service

REST

gRPC

Public Cloud/BMCS
IaaS, SaaS, PaaS

SaaS

PaaS

On Premises

Cloud@Customer
Cloud Machines

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Addressing Barriers to Enterprise Adoption

**Operational resilience**
- High availability
- Autonomous recovery
- Continuous backup
  - Check-pointing

**Performance at scale**
- Parallel execution
- Elastic scale-out
- Resource pooling
- Faster database
- Chaincode in serverless Fn’s

**Security & Confidentiality**
- Permissioned blockchain
- Integrated identity mgmt.
- Certificate revocation mgmt.
- Data at-rest encryption
  - Declarative access controls

**Supportability & Operations**
- Dynamic configuration
- Monitoring dashboards
- Zero-downtime managed patching

**Enterprise Integration**
- REST APIs
- Java & Node.js SDKs
- SaaS Integration Toolkits
- Rich queries with SQL
- Oracle Integration Cloud Connector
  - Visual/low-code development

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Integration Accelerators for OBCS

SAAS APPLICATION INTEGRATION TOOLKITS
- Sample templates & design patterns
- Sample smart contracts & integration components

ORACLE INTEGRATION CLOUD
- Adapters for Oracle & 3rd party applications in cloud and on-prem
- Turn application events into REST calls to run blockchain transactions

ON-RAMPS WITH EMBEDDED APIs

SAAS

• Sample templates & design patterns
• Sample smart contracts & integration components

PaaS

• Adapters for Oracle & 3rd party applications in cloud and on-prem
• Turn application events into REST calls to run blockchain transactions

Legend
- On-premises
- Public or private cloud

SAAS

• Invoke txn’s in sync & async mode
• Get txn status
• Query ledger data

PaaS

• Invoke txn’s asynchronously
• Get txn status
• Query ledger data
• Subscribe to events
• Add channels/peers
• Enroll new members
Creating Business Networks Across Multiple Deployments

- Collaborative network of organizations using a common blockchain
  - Oracle cloud or heterogeneous nodes
- Create a new network or add to an existing network
- Ensure privacy by creating channels with distinct policies and data access spanning multiple orgs
Security and Confidentiality

• Permissioned Blockchain
  – Enrolled membership based on network Founder’s authorization
  – Members exchange X509 certificates
  – Built-in Oracle Identity Cloud Service (IDCS) integration

• Access Control via Oracle Cloudgate and Identity Management CS
  – Transport security via TLS
  – Admin access and REST API authentication via IdM CS defense-in-depth
  – Blockchain network messages authenticated via digital signatures
  – In-transit and at-rest encryption protects transaction messages and stored “world state” & ledger blocks

• Confidentiality Domains within the Blockchain Network
  – Blockchain subnetted into channels to enable private transactions and maintain segregated ledgers
  – Channels established by a group of member organizations with restricted access
  – All transactions sent to a channel can only be endorsed and committed by authorized peer nodes belonging to the specified channel
  – The channel’s ledger is only accessible by the nodes of the organizations authorized to join
  – Member organizations’ nodes join a channel with read-only or read/write permissions
Oracle Blockchain Cloud Service at a Glance

• **Build Trusted Business Networks**
  – Simple Provisioning
  – Complete Blockchain Platform
  – Add Partner Organizations
  – Support Hybrid Networks

• **Automate with Smart Contracts**
  – Business logic for blockchain
  – Event Notifications
  – Quickly build and deploy chaincode
  – Define Endorsement Policies

• **Conduct Private Transactions**
  – Confidentiality domains
  – Easily Control Member Access Privileges
  – Running chaincode across multiple channels
  – Dynamically Create Channels

• **Integrate Blockchain in Applications**
  – REST API-driven Development
  – SDK-based Development (Java, Node.js, others coming)
  – The Applications Integration toolkit: integrated sample applications & smart contracts, templates and design patterns
  – Extend SaaS Apps through PaaS/SAAS, ICS
  – Build New Apps in PaaS App Dev: JCS, ACCS, MCS, PCS...
  – Leverage OOTB support for Blockchain API in
    • Oracle Digital Innovation Platform for open banking
    • Netsuite SuiteCloud Platform.
    • Oracle FLEXCUBE core banking platform

• **Comprehensive Administration, Monitoring**
  – Intuitive Admin Console
  – Dynamically Change the Configuration
  – Easy Monitoring & Troubleshooting
Key Oracle Focus Areas in Blockchain

Enterprise-Ready
- Highly secure, built-in privacy
- Scalable business networks
- Highly resilient, built-in backups and recoverability

Ease of Integration
- REST API and SDKs for Java, Node.js
- API-driven development
- Plug-n-play integration from Oracle SaaS, PaaS, and on premises apps

Quick Time-to-Value
- Pre-assembled, managed PaaS
- Dynamic configurability and member on-boarding
- Start developing applications within minutes

Extending Enterprise Boundary
- Securely extend ERP/SCM/GL business processes in Oracle SaaS, on premises and non-Oracle systems to streamline data exchange and conduct trusted transactions with other organizations
## Speed to Value and into Production

### Increase DEVELOPER EFFICIENCY

- Start developing blockchain applications within minutes
- Leverage API-driven development for cloud or on-premises applications using REST API and API management service
- Easily invoke blockchain services using pre-built integrations from Oracle PaaS and SaaS

### Achieve NON-STOP OPERATIONS

- Gain defense in depth with built-in Identity Cloud Service, reduce risk w/behavioral authentication and granular authorization
- Quickly scale up business network to hundreds of organizations with correspondingly growing transaction volume
- Achieve high resilience with autonomous monitoring and restart with autonomous recovery

### Simplify MANAGEMENT

- Rapidly identify and resolve issues with real-time monitoring dashboards, ledger browser, & extensive logs
- Dynamically change your network configuration by scaling blockchain components up and down
- Easily add member organizations on demand inside and outside Oracle cloud including hybrid deployments
Where Can You Apply Blockchain?

• Blockchain is not a solution to all problems!
• Questions to ask to see if blockchain is applicable
  – Is my business process pre-dominantly cross-departmental/cross-organizational?
  – Are there cross-system discrepancies that impact operations?
  – Is there less than full trust among transacting parties?
  – Does it involve intermediaries, possibly charging expensive fees, adding risk or delay?
  – Does it require periodic offline (batch) reconciliations?
  – Is there a need to improve traceability or audit trail?
  – Do we need real time visibility of the current state of multi-party transactions?
## Use Case Examples in OBCS Early Access Program

### Financial Services
- Corporate customer onboarding
- Bill payments – corp. onboarding
- Financials reconciliation & chargeback
- B2B payments & corp. purchasing
- Cross border funds transfer for subsidiaries
- Merchant POS data reconciliation for faster clearing & settlement

### Supply Chain
- Intercompany invoice reconciliation & inter-division payments
- Food provenance tracking
- Track & trace in logistics/shipping
- Receivables finance, invoice factoring
- Track shipments, receipts of goods, and compliance documents in the supply chain

### Public Sector
- Identity issuance & tracking
- Export licenses and excise taxes
- FDA Medical Counter Measures / RAPID HealthChain
- Procurement & approvals; biz licenses
- Social security data sharing among government agencies in Brazil

### Others
- Electronic cash and utility bill payments
- Securitization and trading of investment-grade rare and precious assets
- Clinical data management in healthcare
- Real estate development funding through tokens
Next Steps

Learn More

http://www.oracle.com/blockchain
http://cloud.oracle.com/blockchain

Join Our Beta Program
Integrated Cloud
Applications & Platform Services
Oracle Blockchain Cloud Service

The most comprehensive distributed ledger cloud platform to securely extend your business processes and conduct online transactions in trusted networks with your suppliers, banks, and other trade counterparties.
In FY 2017, the Fiscal Service:

**Payments**
- Disbursed 95% of the more than 1.2 billion payments

**Collections**
- Collected $4 trillion in federal revenue

**Shared Svcs**
- Provided 74 agencies with admin, FM, procurement and IT services
Financial Management Challenges

Could emerging technology improve these FM areas?

- $100s Billions
  Intragovernmental differences

- $10s Billions
  Software licenses

- $100s Billions
  Grants Management

- $145 Billion
  Improper payments

- $125 Billion
  Equipment purchases

- 3 Billion Square Feet
  Real Property Management
Robotic Process Automation

Process Robotics uses software tools that can be designed to undertake sets of rules-based tasks

### Process Robotics is...

- Software
- Rules-Based
- Here and Now
- A tool

### Process Robotics is not...

- Mechanical / Physical walking, talking robots
- Cognitive / AI / Machine Learning
- Conceptual
- A system or an application

### What it can do

- Opening email and attachments
- Logging into web/enterprise applications
- Moving files and folders
- Copying and pasting
- Filling in forms
- Reading and writing to databases
- Scraping data from the web
- Connecting to system APIs
- Making calculations
- Extracting structured data from documents
- Collecting social media statistics
- Following “if/then” decisions/rules
RPA Pilot Project Goals

Assess how RPA technology could be used to:

1. **Automate** repetitive, rules-based financial management processes
2. Provide **cost savings** to the Bureau and entire federal Financial Management community
3. Gain **efficiencies** and **improved compliance** in financial processes by decreasing existing human error rates

Provide an understanding of:

- The degree to which policies, oversight, and governance will need to evolve to support future automation
- How this pilot can be applied to additional use cases in Federal financial management
- Relevant performance metrics (cost and resources) of RPA
## Is RPA the Right Fit?

### Criteria for Evaluating Processes:

<table>
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<tr>
<th>Criteria</th>
<th>Description</th>
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<tbody>
<tr>
<td>Number of Systems Used</td>
<td>Does the process require employees to access multiple independent systems to complete the process?</td>
</tr>
<tr>
<td>Transaction Volume</td>
<td>Does the process have high-volume transactions?</td>
</tr>
<tr>
<td>Prone to Errors or Rework</td>
<td>Does the process involve manual activities which may result in errors due to human operator mistakes?</td>
</tr>
<tr>
<td>Process Predictability</td>
<td>Can the process be defined by a set of unambiguous business rules?</td>
</tr>
<tr>
<td>Rules Based Exception Handling</td>
<td>Can the process be completed with few exceptions in delivery?</td>
</tr>
<tr>
<td>Manual Work Involved</td>
<td>Does the process include large amounts of manual work?</td>
</tr>
<tr>
<td>System Upgrade Timing</td>
<td>Process should be avoided if it interacts with a system scheduled for a major planned upgrade within 6 months. Major upgrades beyond minor enhancements need to be planned for in order to prevent rework.</td>
</tr>
<tr>
<td>Controls Importance</td>
<td>Is the process high-risk or include sensitive data that requires strong oversight and set of internal controls?</td>
</tr>
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Given the scale of potential automation, implementation of RPA at scale on FM processes typically see a return on investment within 6-12 months.
Blockchain Proof of Concept Project Goals

1. Assess how blockchain technology could be used to:
   - Register, track, and manage asset inventory
   - Provide near real-time validation of asset transfers and disposals without the need of an intermediary
   - Streamline and automate large-scale inventory processes and reporting
   - Provide end-to-end visibility over the state of the inventory

2. Provide an understanding of:
   - The degree to which policies, oversight, and governance will need to evolve in a blockchain ecosystem
   - How this proof of concept can be applied to additional use cases in Federal financial management
   - The degree to which a production-ready asset management solution could save the government money
When is Blockchain the Right Fit?

Use case criteria for evaluating possible fit:

- **Shared Data**
  - Do you need a **structured central repository** of information?

- **Multiple Writers**
  - Is more than one entity reading or writing the transactions on the database?

- **Absence of / or Low Trust**
  - Is there **less than complete trust between entities** in the ecosystem? (e.g., one user will not accept the “truth” as reported by another user)

- **Opportunity for Disintermediation**
  - Are **central gatekeepers** introducing costs and/or friction when verifying transactions?

- **Transaction Interaction**
  - Are there **routine or logical interactions** that occur between entities that could be programmed to self-execute (e.g., smart contracts)?
The team assessed five primary stakeholder groups and identified their unique pain points in order to design a system that provides a distinct value for users.

**Property Management**
- Manual, labor intensive, and time consuming inventory process
- Difficult to track and enforce asset ownership
- Lack of reliable reporting functions

**End User Support**
- Difficulty reporting on assets
- Ordering assets
- Validating disposal list

**Leadership**
- Lack of real-time visibility of state of the inventory

**Property Custodians**
- Validating transfers to/from employees
- Manual, labor intensive, and time consuming inventory process
- Majority of responsibility as asset owner for several devices

**Employees**
- No transparency regarding assigned equipment

**Inventory Management Pain Points**
Asset Inventory Management (current process)

**Key**
- Mandatory Action
- Inventory Process
- Friction Point

**End User Support (EUS)** orders and Property Management (PM) receives new assets.

PM checks quantity/model and compares to purchase order.

EUS requests the PM warehouse ships certain quantity of assets to specific location.

PM puts a barcode on each asset, scans into Asset Management System (AMS) under EUS cost code to create digital record.

PM prepares for annual inventory.

PM conducts annual inventory and scans all assets.

PM, EUS, and/or PC conduct manual search for missing assets.

PM closes inventory and finalizes report.

EUS sends PM a list of assets for disposal.

PM disposes of assets and updates AMS.

EUS receives assets and checks configuration.

EUS transfers physical asset to Employee or keeps it in storage.

PM sends email notification between sending/receiving cost codes.

PM, EUS, and/or PC conduct manual search for missing assets.

PM syncs scanners to AMS to reconcile inventory.

EUS collects equipment and accepts transfer in AMS.

EUS sends PM a list of assets for disposal.

PM, EUS, and/or PC conduct manual search for missing assets.

Employee leaves or broken asset: Ticket created for EUS pickup.

PC transfers asset to EUS cost code in AMS.

PM disposes of assets and updates AMS.

PM, EUS, and/or PC conduct manual search for missing assets.

Employee leaves or broken asset: Ticket created for EUS pickup.

PC transfers asset to EUS cost code in AMS.

PM disposes of assets and updates AMS.

PC physically verifies asset.

AMS sends email notification between sending/receiving cost codes.

PC either:
- accepts transfer in AMS and confirms cost code, or
- rejects transfer and works with EUS to resolve.

EUS collects equipment and accepts transfer in AMS.

EUS determines if equipment can be re-used.

PM, EUS, and/or PC conduct manual search for missing assets.

Employee leaves or broken asset: Ticket created for EUS pickup.

PC transfers asset to EUS cost code in AMS.

PM disposes of assets and updates AMS.

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Technical Stack Considerations

Blockchain Protocol
The blockchain protocol chosen is going to depend on the needs of a particular project.

Consensus Mechanism
Consensus determines the process by which blocks are validated and get added to the blockchain.

Client Selection
This is what allows for communication with the blockchain.

Infrastructure: Compute/Storage
The infrastructure component provides the compute and storage needed to run a blockchain application.

External Database
External databases hold data stored off-chain. Supplementing the blockchain with an external database allows us to achieve greater network speeds on the blockchain.
FIT aims to assess how distributed ledger/blockchain technology could be used to **improve financial management** including asset registry and tracking, inventory accuracy, and reporting.

**End-to-end asset lifecycle transactions and state changes** are recorded on a distributed ledger and shared among users, providing a single source of truth for asset information.

- **Complete, accurate, immutable records**
  - Scan and tokenize assets
  - Electronic transfer of ownership between users
  - Automatic notifications to users sending and receiving asset transfers
  - Automated initiation of inventory process
  - Electronic verification of asset ownership
  - Automated notifications when assets reach end of life
  - Electronic transfer of ownership between users

**Desired Outcomes**

- Real-time visibility of asset inventory
- Reduction in manual process time
- Trusted, efficient peer-to-peer transfers
- Understanding of DLT’s applicability to financial management

**Fiscal Service Users**

- Property Management
- IT Staff
- Employees
- Property Custodians
- Bureau Leadership

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Questions and Answers

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