Using Orchestrations to Automate Exchange Rates

Mohammad Shujaat & Tim Randall

Thursday, August 15, 2019

Tim Randall

Oracle Applications Manager, Granite Construction
Houston, TX
Tim.Randall@gcinc.com

Executive summary

Solutions-driven programmer with experience in programming and project design in an iSeries and PC environment. I use the System Life-Cycle design method to manage projects to design, develop, test and implement new information systems and to create enhancements to existing information systems. Proven success engineering customized solutions improving business processes, operations and profitability

Tim has worked and excelled in CNC, Development, and Management Roles in the JDE ecosystem for over 20 years. Tim has worked at the Layne Christensen Company in various roles, and led his team of business analysts, developers and contractors through an acquisition by Granite Construction. Tim & His team have now transitioned to Granite Construction and Tim leads his team as the Oracle Applications Manager at Granite Construction

Industries

- Construction & Building Materials
- Metals and Mining
- Mineral Exploration Drilling
- REST integrations
- CNC
- Development
- System Administration
- IT Management

Education

Bachelor of Science in Mathematics, Culver-Stockton Collage, Canton MO
Masters of Science in Management Information Systems, University of Phoenix

Mohammad Shujaat

Senior Associate, Business Applications
Cincinnati, OH
Mohammad.Shujaat@us.gt.com

Executive summary

Mo is a Senior Associate with Grant Thornton in the Technology Solutions practice. He has over 5 years of consulting experience, across a diverse set of companies and industries. Mo's experiences include hands on management and implementation of ERP software packages, business process reengineering and system architecture design. Mo is passionate about using JDE usability tools and orchestrations to provide customers with creative and unique solutions which help progress them on their digital journey. Mo is also experienced in blockchain solutions and has implemented machine learning solutions with JDE.

He has experience with the processes and configuration of the JDE Distribution and Manufacturing modules, specifically with the, Procurement, Sales, Inventory, Advanced Pricing, Shipping, Discrete Mfg, MTO Mfg, and Transportation. Mo also has experience with multiple releases of the software, web services, and warehouse data collection. Prior to joining Grant Thornton Consulting, Mo was an experienced consultant at an Oracle Partner

Industries

- Consumer Products
- Retail
- Metals and Mining
- Mineral Exploration Drilling
- REST integrations
- Construction & Building Materials
- Automotive Parts Manufacturing
- Metals Components
- Data Collection
- Third Party Logistics
- Inbound / Outbound Transportation
- Machine learning
- Blockchain

Education

Bachelor of Science in Information Systems and Analytics, Miami University of Ohio

About Grant Thornton

Office locations

59 offices spread across 30 states and Washington D.C.

Reach

Serve 36% of companies on the 2017 Fortune 500 list and 25% of companies on the Russell 2000 list

Our services

• Assurance • Tax • Advisory

People

More than **8,500** professionals in the U.S.

Partners

594 partners serving more than 8,000 clients in the nation

Revenue

GT U.S. net revenue equals **$1.74 billion**

stats are as of 07/31/2017

Agenda

- **JDE Orchestrator Overview**
- Orchestration Use Cases
- Orchestrator Journey – Granite Construction
- Q & A

Orchestrator Overview

- JDE Orchestrator: New tool in the JDE arsenal
  - Uses Application Interfaces Server(AIS) to interact with your JDE environment
- JDE Orchestrator Features:
  - Can automate business processes (RPA)
  - Allow for easier connections and integrations with JDE
  - Increase communication of information between JDE and decision makers in the business
- Orchestrator was designed to be used by analysts, developers, and even super users of JDE (Collectively referred to in this document as developers)
  - Requires knowledge of JDE application & UBE logic

Orchestrator Overview

- All orchestrator components are User Defined Objects
  - Created in Orchestrator Studio, Administered in JDE
- Within the JDE Orchestrator developers can create these components and group them together to execute functionality inside JDE
  - Example:

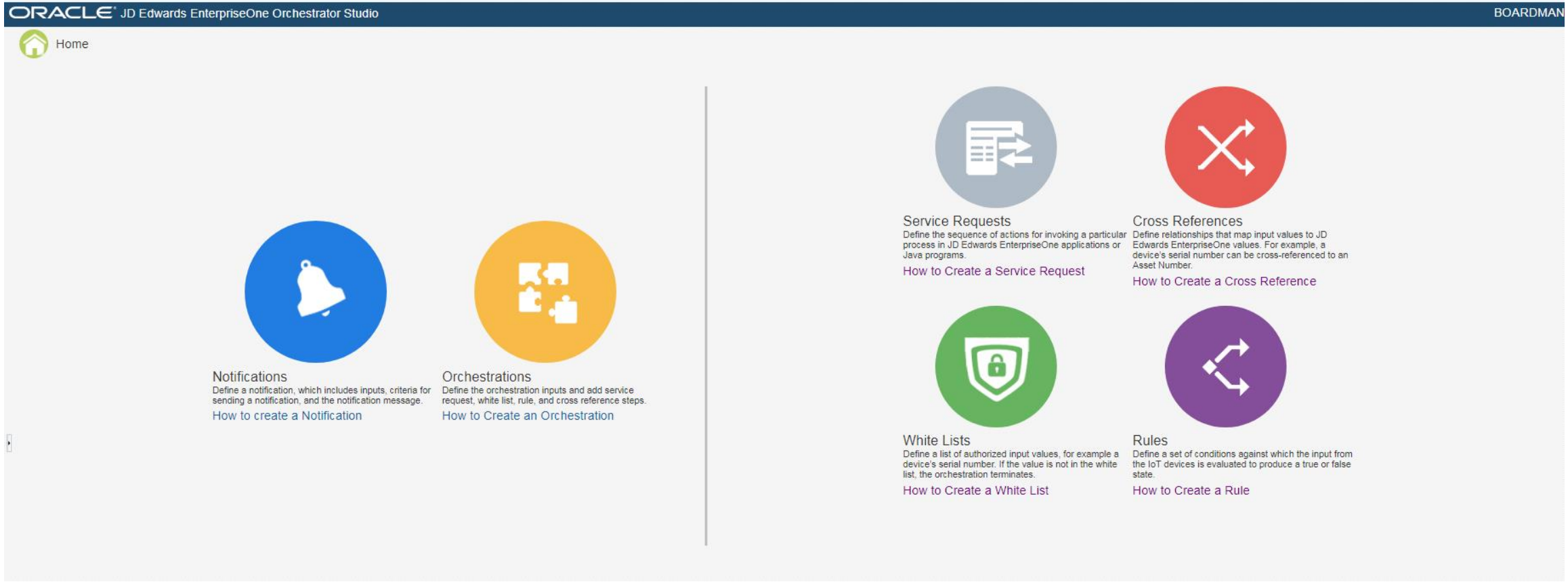
- All in one contained service: **Orchestration**

Orchestrator Overview

JDE Orchestrator is a tool that consists of many **components:**

1. Orchestrations
2. Service Requests
3. Rules
4. Notifications
5. Schedules
6. Recordings
7. White Lists
8. Cross References

Orchestrator Studio



Orchestration Studio

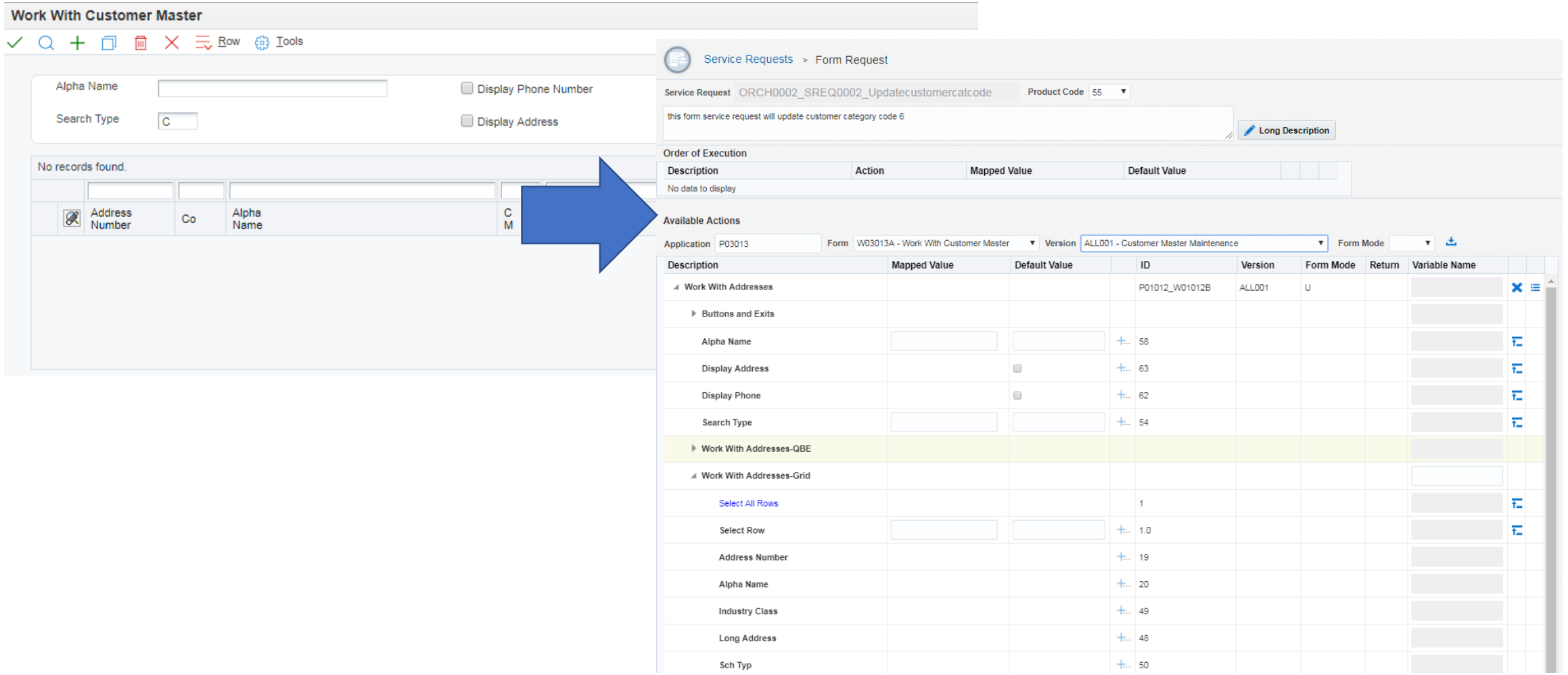
- Orchestrations and all other components are created in the **Orchestration Studio**
  - Orchestration studios use the same credentials as the JDE environment
- Orchestrations and components are all created, edited, and managed through the orchestration studio
  - UDO functionality still lives in JDE Web Client
    - Sharing, Security, and Promotions

Service Requests

Types of Service Requests:

1. Form Service Requests: Used to interact with JDE application forms
2. Data Service Request: Used to query and aggregate data from JDE
3. Message Service Request: Used to send messages to JDE users
4. Report Service Request: Used to execute JDE UBEs
5. Watchlist Service Request: Used to query and check JDE watchlists
6. Connector Service Request: Used to connect to external systems, databases, or orchestrations

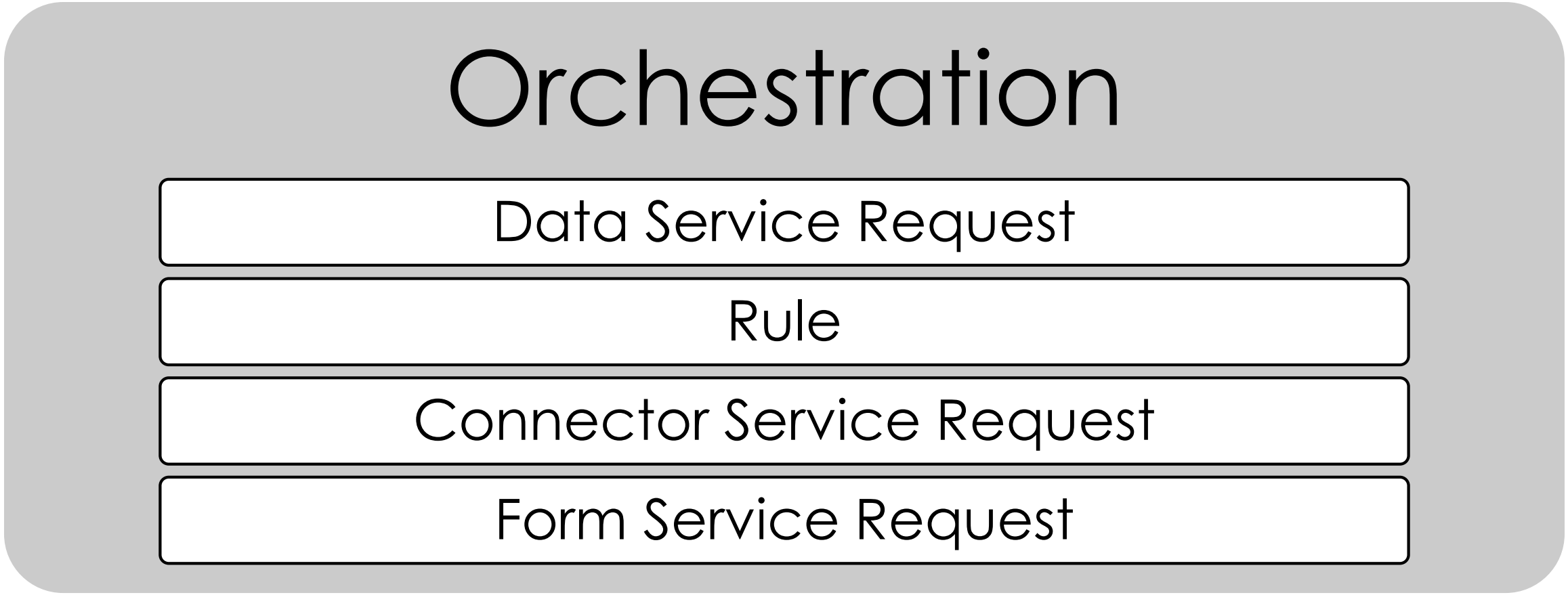
Form Service Requests



Connector Service Request

- Connect to External RESTful APIs
- Connect to External Databases
- Connect to other orchestrations or notifications
- Receive or Send files via FTP, SFTP, or REST

Orchestration



Agenda

- JDE Orchestrator Overview
- **Orchestration Use Cases**
- Orchestrator Journey – Granite Construction
- Q & A

Automation Journey

Past: Subsystem/Batch automation

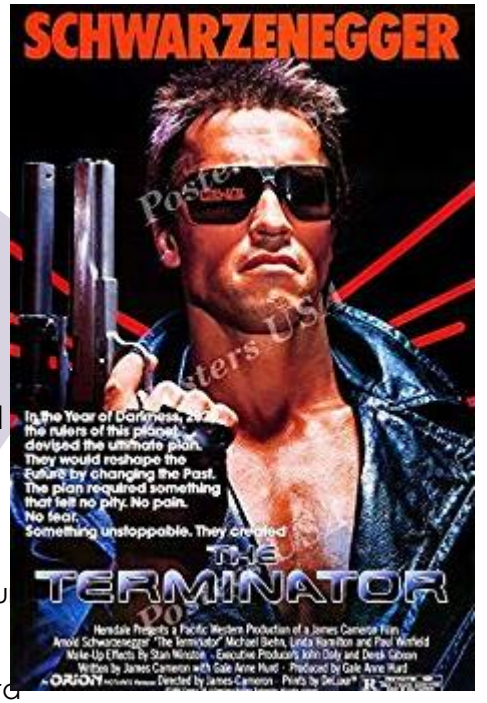
- Can hog system resources
- Limited Error handling
- Limited notification capability
- Time consuming to develop & maintain
- Building Decision making capability requires high LOE

Current World: Robotic Process Automation

- Automate rote and repetitive tasks using Bots
- Trigger bots execute actions based on pre defined conditions
- Build in light decision making into RPA process
- Great stepping stone to embedding AI building blocks in your enterprise
- Notify users of exceptions, or actionable items requiring their human intelligence

Near Future: Artificial Intelligence using NLP/ML

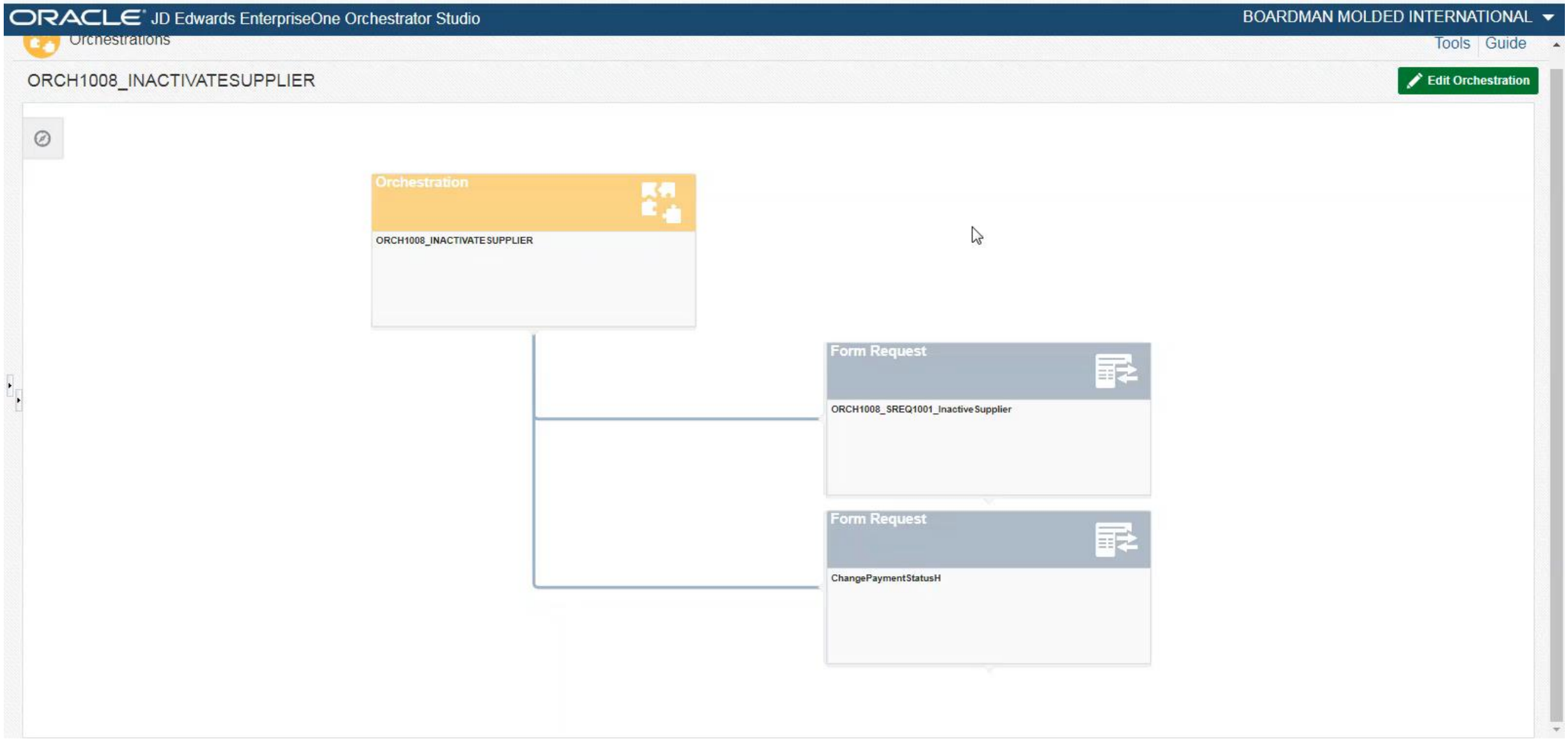
- Create AI Programs which can communicate with you customers and employees
- Monitor & Analyze data to find exceptions, inefficiencies, and inconsistencies
- Make decisions based on prior learned events and execute actions
- Replace the decision making workforce with a decision approving workforce



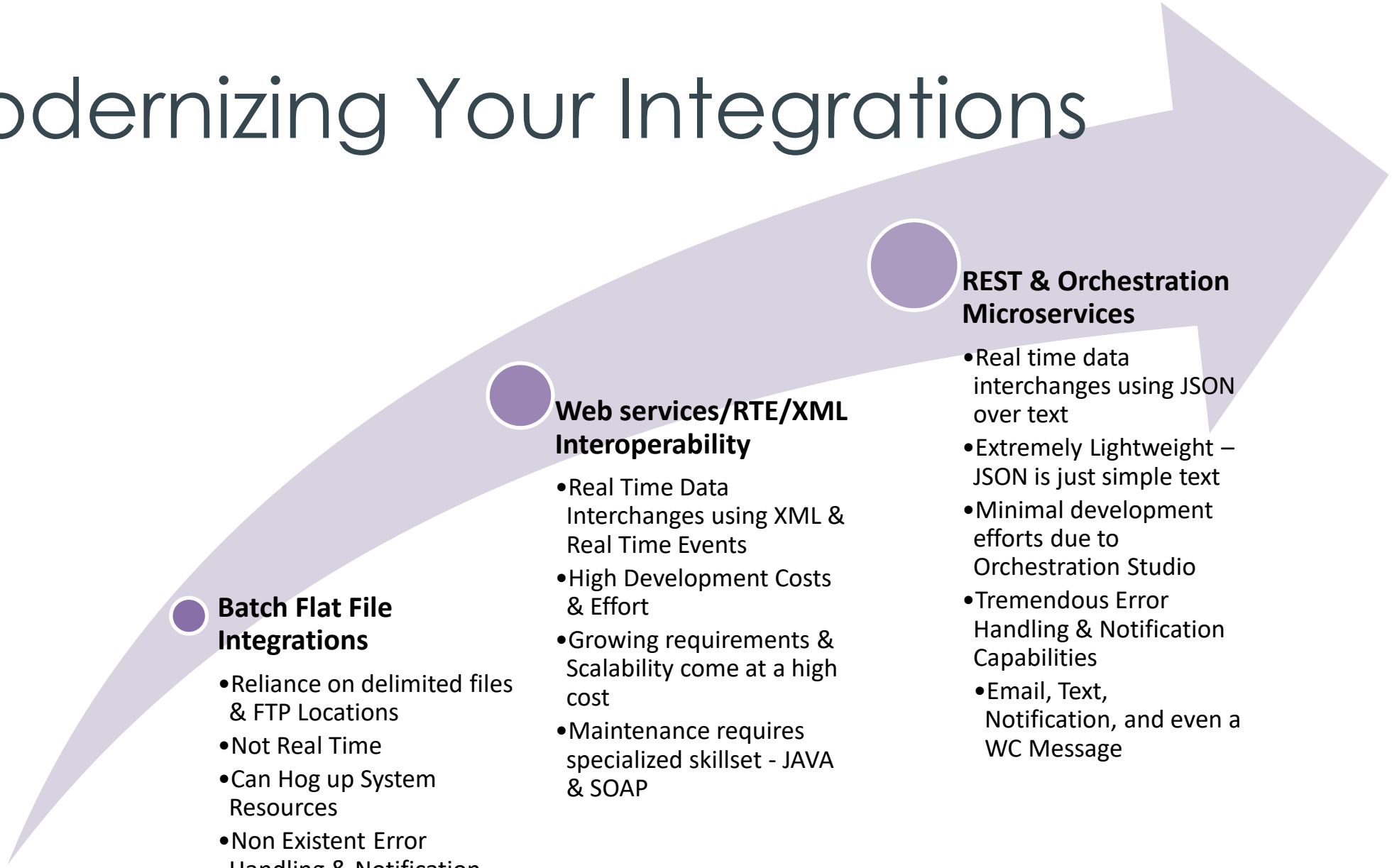
RPA in JDE

- RPA – Robotic Process Automation
  - Forrester predicts in 2019 RPA will add 500,000 "digital workers" in the US
- Orchestrator is an amazing & free RPA tool!
  - Low Code Solution - No coding required (Except for advanced features)
  - Can be used to automate test cases
  - Can automate numerous repetitive tasks – Let users focus on tasks that engage their skills and intelligence
    - Build light decision making and exception handling using Rules & Orchestrator Exception Handling

  > Making progress, every day, on the work employees know is most important is the most critical factor in their ongoing engagement. It's more important than recognition, meaningful work, and social support.
  >
  > — *Using Small Wins to Ignite Joy, Engagement, and Creativity at Work, Harvard Business Review Press*
- Examples:
  - AP Video


ORACLE JD Edwards EnterpriseOne Orchestrator Studio
BOARDMAN MOLDED INTERNATIONAL
Orchestrations
Tools
Guide
ORCH1008_INACTIVATESUPPLIER
Edit Orchestration
Orchestration
ORCH1008_INACTIVATE SUPPLIER
Form Request
ORCH1008_SREQ1001_Inactive Supplier
Form Request
ChangePaymentStatusH

Modernizing Your Integrations



Batch Flat File Integrations

- Reliance on delimited files & FTP Locations
- Not Real Time
- Can Hog up System Resources
- Non Existent Error Handling & Notification capabilities

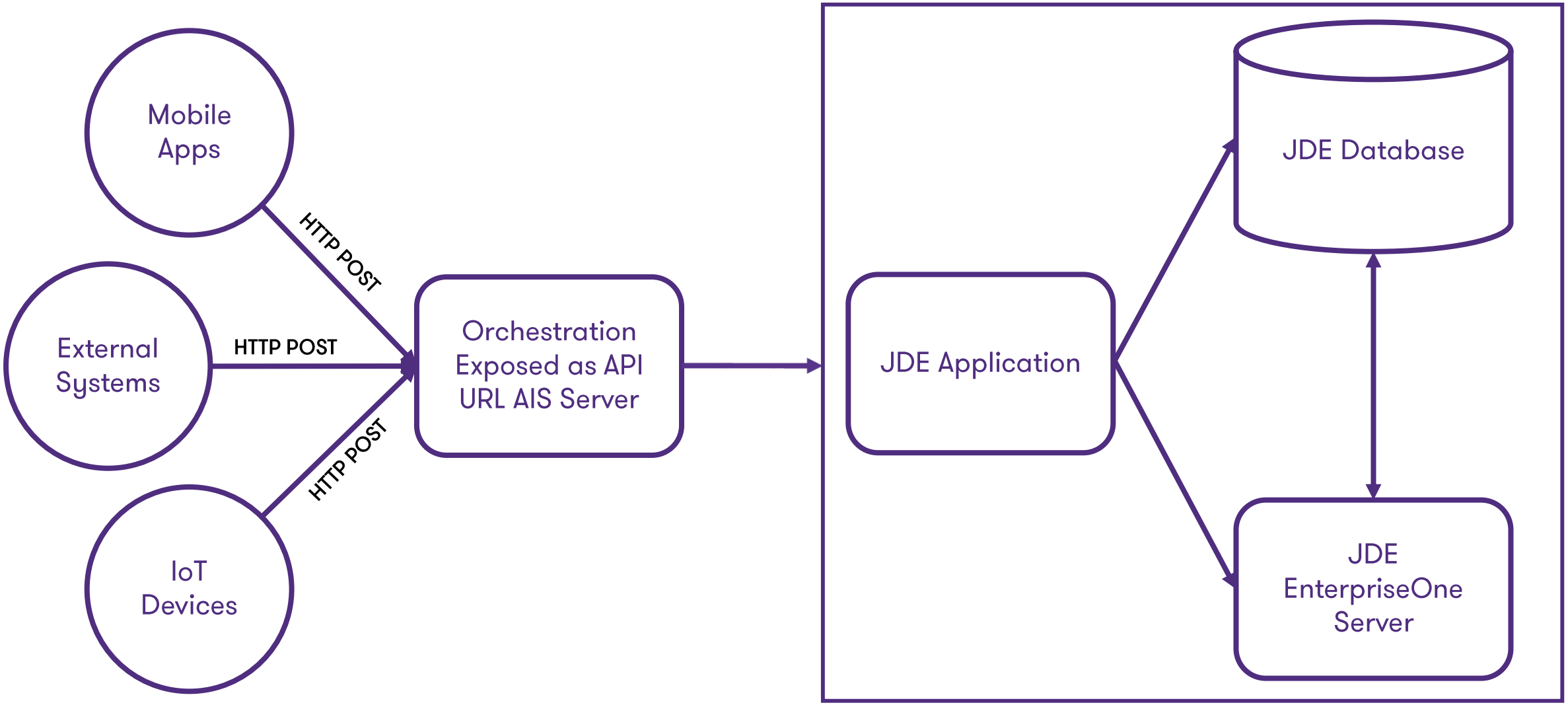
Web services/RTE/XML Interoperability

- Real Time Data Interchanges using XML & Real Time Events
- High Development Costs & Effort
- Growing requirements & Scalability come at a high cost
- Maintenance requires specialized skillset - JAVA & SOAP

REST & Orchestration Microservices

- Real time data interchanges using JSON over text
- Extremely Lightweight – JSON is just simple text
- Minimal development efforts due to Orchestration Studio
- Tremendous Error Handling & Notification Capabilities
  - Email, Text, Notification, and even a WC Message

Inbound Integrations Using Orchestrator



Orchestration Design Considerations

- Orchestrations are powerful but they are not the solution to every problem!
- Work with the business to determine if the orchestrations are a good fit
- Consider the following:
  - What process are we trying to improve?
  - Is the process stable and repeatable?
  - Is the problem something that can be corrected with an automated process?
  - How complex is the business problem?
  - Can we break the problem out into smaller pieces and automate those?
- Tools release can make or break some requirements

Orchestration Creation Guidelines

- Once a process has been selected and determined a fit for an orchestration there are some points to consider prior to creating the orchestration:
  - What is the data required for this process?
  - What transactions need to occur?
  - What data will need to be updated for this process?
  - What UBE or applications will need to be used for this process?
- It is highly recommended to map out each step and action within a process prior to creating the orchestration
  - Remember an orchestration is just a robot user! It needs to be taught every single step (no matter how miniscule it may seem to us)

Agenda

- JDE Orchestrator Overview
- Orchestration Use Cases
- **Orchestrator Journey – Granite Construction**
- Q & A

About Granite Construction

- Granite Construction & Layne Christensen Company
  - Provide Construction, water resource, & mineral exploration services
  - Granite Construction & Layne Christensen merged in 2018
  - Layne was already using JDE multicurrency, but Granite wasn't
    - Provided us with a perfect first use case for orchestrations
- JDE Release: 9.2.2.4
  - Orchestrator Studio Version: 6.0
- When we started, Granite did not have any infrastructure set up for AIS or orchestrations
  - Had to start at step 1

Step 1…

Infrastructure Design & Setup

- Designed/documented the server requirements & layouts
- Submited requests for additional VM's, CNC resources, Server installation, and training

UDO Administration

- Orchestrations & other UDO's required administration and setup
- Had to enable UDO's in the environment

WebOMW Administration

- WebOMW is similar…but different
- Administration & rules around UDO OMW promotions

Get our feet wet…

- Why Oanda Currency Exchange Rate Integration First?

Simple & Easy

Currency Exchange rate pull was a relatively low complexity integration

Lower Risk

The integration had an easy & manual work around – Just in case

Need

Legacy integration was built in a platform that was being retired

Step 2....

Connection Setup

- Had to create external connections between JDE & Oanda/Dell Boomi
- Required CNC Resources as well as security consideration as we were opening up JDE to an external system

UDO Security

- UDO administration enabled the UDO's
- but now we had to go through the exercise of who can create, modify, and publish Orchestrations & other UDO's

Training

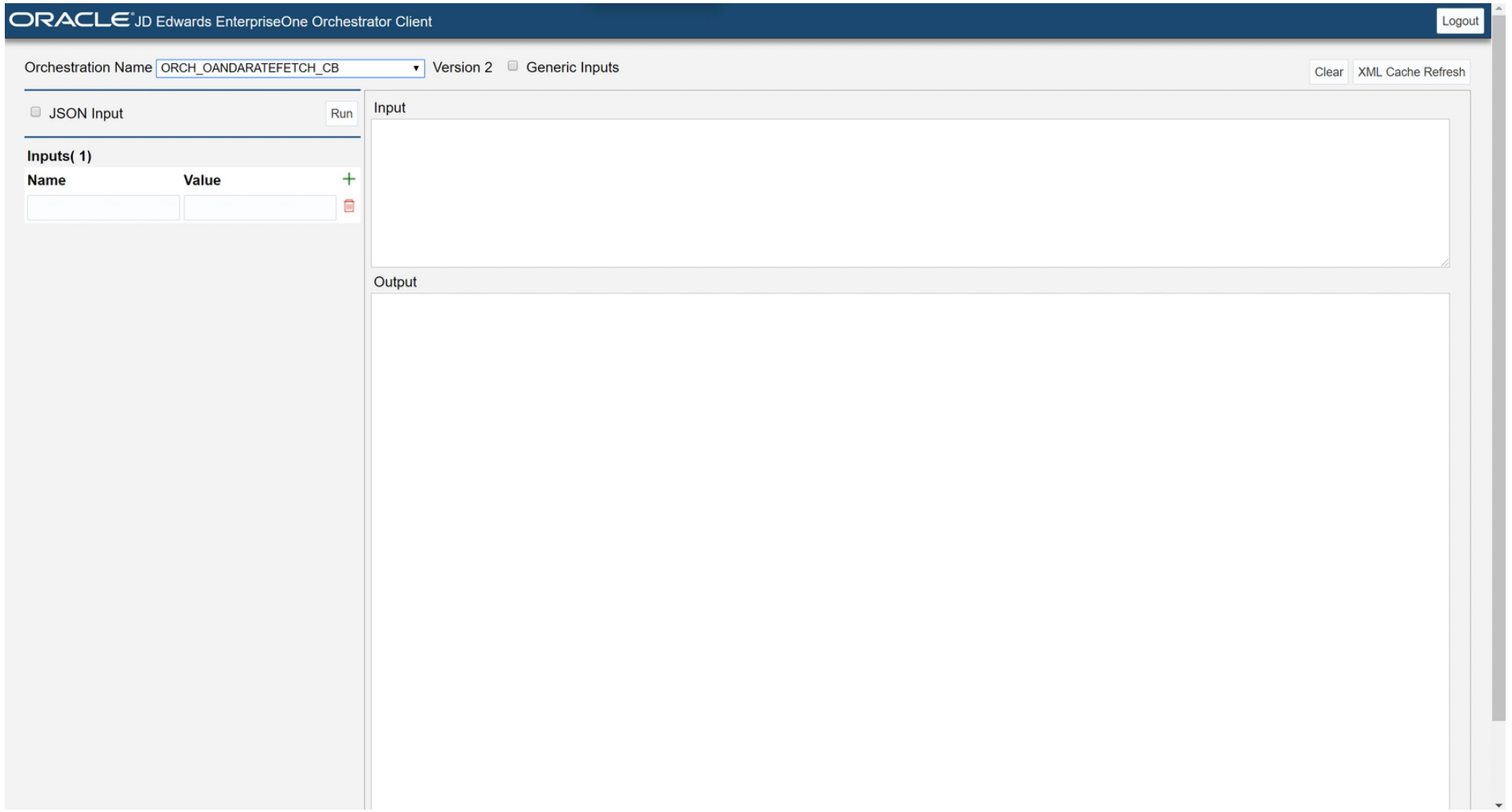
- GT helped create the first round of orchestrations
- Then trained us on how we could create them ourselves

Oanda Currency Fetch Orchestration

Orchestration

- Data Service Request – To Grab the Rate Pairs
- Rule – To Determine Which Exchange to Use
- Connector Service Request – To Send the Request to Oanda
- Form Service Request – To update the Currency Exchange Rates in JDE

Orch Example for Exchange Rates



Granite – Exchange Rate Integration

Use Case Viability

- Discussed with stakeholders and presented the case for orchestrations as the right solution

Design Process

- Orchestrator – Major shift in IT ideology & Brand new technology
  - Required POC & buy in

Challenges

- On Orchestrator version 6, no exception handling which required us to build that in another tool (Dell Boomi)

Wins

- Replaced batch based interface to real time interface
- Scalability was built into the orchestration
- Worked through UDO & Orchestration administration, security, training and growing pains on a simpler orchestration

And Then We Dived In…

- Certify Expense Management Integration was Next

Granite – Certify Expense Mgt

Use Case Viability

- Exercise to determine if Orchestrator was the right fit
  - Outbound = Not the right fit (# of records, complexity of data filtering
  - Inbound = Was a good fit

Design Process

- Utilized standard JDE batch expense entry with orchestrator
- Orchestrator served as the messenger between Certify & JDE

Challenges

- API/JSON Limits compounded with the existing limits of orchestrator
- Environment setup differences caused orchestration to behave differently

Wins

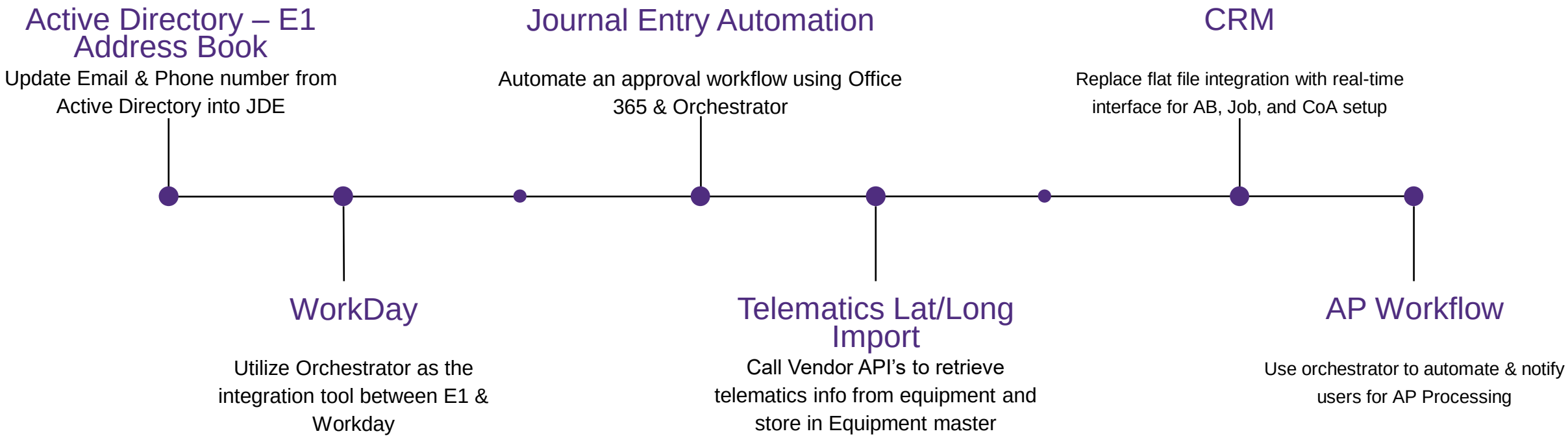
- Simplified development of the integration
  - Use standard APIs from certify
- Real time integration
  - Not based on a batch UBE
- Allowed us to use vanilla JDE validation on the data

Granite – Lessons Learned

Keep it simple	• Break down the orchestrations into as small as possible • Layer the complexity across multiple orchestrations
Leverage JDE E1 Where you can	• Maintain data in E1 & Address problems upstream in E1 to simplify the orchestration downstream
Test the limits of your data set	• Try and reach the upper limits and capabilities of the integration to find issues beforehand
Have trusted & experienced resources available	• Orchestrations are easy, but its always good to have help

And Now We're Hooked!

- Orchestrator has created new possibilities for Granite Construction
- Orchestration Roadmap for Granite Construction



Agenda

- JDE Orchestrator Overview
- Orchestration Design Use Cases
- Orchestration Use Case Examples – Granite Construction
- **Q & A**

Questions

JD Edwards

INFOCUS