Integrating the Enterprise

How Business Leaders are Implementing Digital Integration
Today’s Session – In Review

Business Value of IoT
- Market Potential
- Opportunity
- IOT Examples

Building an IoT Backbone
- IOT Platform
  Architecture to manage high frequency data

Integrating the Enterprise
- Cloud and hybrid approaches
- Integrating IoT with line of business applications
Why Do You Need Digital Integration?

A company that implements “Digital Integration” can respond to changing conditions quickly because all people and automated systems have situation awareness.
Integration is evolving to support a digital business

**Rise of the Citizen Integrator**

Lines of business have more power and budget for technical decisions and citizen integrators are domain experts who use tools to extend or integrate business software systems.

**Customer Experience**

Customers expect service anytime, anywhere and a consistent experience across all phases of engagement and all platforms.

**Mobile Workforce**

People are the greatest asset and now expect to have core capabilities available to them wherever they are. Internal systems must be available on many different devices beyond the desk.

**Rise of Things**

Smart devices are prevalent throughout our world and pushing the boundaries of where organizations need to integrate.
Changing Integration Needs

ETL
Batch Integration
Main Frames
EDI
EAI
XML
SOAP/ Web Services
ESB
SOA
API/REST/JSON
API Economy
Cloud
Mobile
Lightweight Integration
Container Based Deployment
Big Data
IoT
Microservices
Readying for Digital Integration

How do you transition from what you have to where you want to go?

*First, understand where we are and how we got there.*

Evaluate this from two vantage points:

- Technology
- Culture
Digital Transformation
Requires integration changes on two fronts.

Technology
(Architecture)

Culture
(People and Processes)
Technology
(Architecture)
What does your organization’s integration technology landscape look like?
Level 0 – Single App

• Most organizations start here.
• Single system that manages their core product or offering.
Level 1 – Master App and Sub Apps

Point to Point Solution
- HR
- Finance
- Marketing
- ERP
- Custom Built App
Level 2 – Multiple Master App with a Hub Master App
Level 3 – Multiple Apps connected to a Single Bus (ESB)
Level 4 – A single Bus (ESB) Connected to a Cloud Platform
Computing has Moved to the Edges

which introduces new integration challenges and opportunities
IoT Solution is an Integration Solution

- Stream Analysis
- Device Management
- Device Telemetry
- Business Metadata

- Hundreds of endpoints
- Bi-directional Communication
- Authentication of endpoints
  - Event Processing
  - Policy Evaluation
  - High throughput
  - Low Latency
  - Reliability

- Orchestration
- Transformation
- Bus. Activity Monitoring
The IOT Platform

Essential components of an IOT system
Level 5 – Digital Integration – Hybrid Approach

**Simple Events**
- Large volume of events
- Message sizes are small
- Volume is extremely high.

**Edge**
- An on demand platform that can scale based on signal velocity

**IOT Platform**
- Cloud Scale Event Processing iPaaS

**Enterprise Systems**
- LOB systems on Premise will continue to be brokered through existing ESB implementations
Level 6 – Cloud Born Digital Integration

Simple Events
- Large volume of events
- Message sizes are small
- Volume is extremely high.

IOT Platform
- An on demand platform that can scale based on signal velocity

Cloud Hosted App
- LOB systems on Premise will continue to be brokered through existing ESB implementations

Edge
- An on demand platform that can scale based on signal velocity

Cloud Scale Event Processing iPaaS
- Edge
- Stream Processing
- Data Warehouse
- Data Marketplace
- Data Analytics
- Event Processing and Policy
- Dispatch & Orchestration
- Enterprise Authentication
- Management Console
- Edge Device Management
- Data Visualization
Culture
(People & Processes)
What does your organization’s integration team structure look like?
Central Integration Delivery Team

Integration Team

- Integration Specialist
- Integration Specialist

- Team 1
- Team 2
- Team 3
Cross Functional Teams

- Integration Specialist
- Mobile Specialist
- Database Specialist
- SAP Specialist
- Analyst
- Web Developer
- Web Developer
- Scrum Master
Pros and Cons

Central Integration Delivery Team

ADVANTAGES
- Single view of integration
- Strong Governance
- Mature Processes

DISADVANTAGES
- Doesn’t scale well
- Everyone depends on the integration team
- Bandwidth limitations

Cross Functional Delivery Team

ADVANTAGES
- Team has all skills it needs
- Costs are shifted as Capex on large initiatives

DISADVANTAGES
- Skills often non transferrable within team
- Expensive
- Lots of potential blockers
- Skillsets not widely available
- Short lived teams leads to nomadic solutions
- Difficult to be consistent across teams
Modern Integration Trends

Digital Workplace driving the Citizen Integrators

Overlapping Capabilities can Lead to Duplication and Increased Costs

There’s No One-Size-Fits-All

Different Integration Developers Require Different Technologies
## Organizing Modern Integration Roles

<table>
<thead>
<tr>
<th>Central Integration Team (Specialists)</th>
<th>Cross Functional Team (App/LOB Integrators)</th>
<th>Citizen Integrators</th>
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</thead>
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<tr>
<td>Coaching</td>
<td>Doing bulk of implementation</td>
<td>Integrators everywhere</td>
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<tr>
<td>Supporting</td>
<td>Working within Integration Constraints</td>
<td>Integration specialists act as coaches to them</td>
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<tr>
<td>Escalation</td>
<td>Working on other non-integration features</td>
<td>Integration Analysis</td>
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<td>Governing</td>
<td>Low risk integration</td>
<td>Light weight integration</td>
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<td>Defining Approaches</td>
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<td>Low risk integration</td>
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<td>Defining Standards</td>
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<td>Implementation on hard projects</td>
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<td>Pair programming</td>
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</table>
Integrators Everywhere

Integration Coordinators:
- Coaching
- Supporting
- Escalation
- Governing

Project Team
- Database Specialist
- SAP Specialist
- Analyst + Citizen Integrator
- Web Developer + Ad-hoc Integrator
- Web Developer + Ad-hoc Integrator
- Scrum Master

Integration Coordinators
- Integration Specialist
- Integration Specialist

Mobile Specialist + Ad-hoc Integrator
Integration Platforms
High Availability and Resiliency
Significant Throughput
Modern Infrastructure
Lightweight
Transient Endpoints
Low Barrier of Entry
Not as important ...

Application Adapters
Transformation Engine
Workflow
Rich User Interface
Modern Integration Criteria

- Base messaging patterns
  - Publish / Subscribe
  - Queuing
  - Request / Response
IoT Reference Architecture
We chose Neuron for On-Prem Integration

- A commercial low latency high-throughput pub-sub capability available on the platform today.
- Lightweight Publish / Subscribe built on WCF core with swappable transports
- Patterns: ESB, MOM, Lightweight EAI
- Connectivity: Web Services, Adapters, API
- Extensibility: Adapter SDK, Pipelines (allow inline dynamically compiled custom coding and references to external DLL’s)
- Latest Version: 3.5
Neuron ESB Explorer

Getting Started Center

Which area would you like assistance with?

Documentation
For information about Neuron, consult the documentation. You'll find guidance, examples, and best practices.

Messaging
A publish and subscribe messaging infrastructure can be used to abstract and dynamically route, process and mediate between all-service and adapter endpoints.

Repository
Neuron can be a repository for XML documents, WSDL, XML schemas and XSL transformations. Click here to store data.

Connections
Neuron service endpoints are used to host web services and dynamically route to existing ones. Adapter endpoints are used to bring in data from host applications, databases or protocols.

Business Processing
Using processes, custom operations can be executed when a message is sent or received. Click here to define a process.

Monitor Activity
Monitor activity in real-time as well as get reports on session activity, auditing, and failures. Users can edit and retrieve audit and failed messages to any endpoint.

Samples
Browse the Neuron configuration and code samples.
Process Designer
Technology Choices

Filling the architectural blue print with technology and changing organization culture is not easy!

Apache Kafka  AWS IOT  Neuron ESB
Azure Service Bus  AWS Lambda  Flow
Azure Event Hubs  AWS Stream Analytics  Notification Hubs
Azure IOT Hubs  Device Shadows  BizTalk Services
Stream Analytics  Kinesis  Azure Machine Learning
Logic Apps  S3 / Dynamo DB  SQL Database
Azure Storage  Amazon Cognito  Rabbit MQ
Microsoft Technology Stack

**EAI/ETL**
- Azure BizTalk
- BizTalk Server
- Data Factory
- SSIS

**Messaging**
- BizTalk Server
- Service Bus Messaging
- Event Hubs

**Orchestration**
- Logic Apps
- BizTalk Server

**IoT**
- Event Hubs
- IoT Hubs

**API**
- API Apps
- API Management

**Hybrid Connectivity**
- Azure BizTalk
- Service Bus Relay
- VPN
- Express Route

**BAM/Analytics**
- Power BI
- Stream Analytics
- Event Hubs

**Citizen Integrator**
- Power Apps
- Flows
Logic Apps Demo
## Citizen Integrator: Microsoft Flow

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<tr>
<th>Azure Blob</th>
<th>Box</th>
<th>CRM Online</th>
<th>Dropbox</th>
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<tbody>
<tr>
<td>Facebook</td>
<td>FTP</td>
<td>GitHub</td>
<td>Google Drive</td>
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<td>MailChimp</td>
<td>Translator</td>
<td>Office 365 Outlook</td>
<td>Office 365 Users</td>
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<td>Office 365 Video</td>
<td>OneDrive</td>
<td>OneDrive for Business</td>
<td>Outlook</td>
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<td>Project Online</td>
<td>RSS</td>
<td>Salesforce</td>
<td>SendGrid</td>
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<td>Service Bus</td>
<td>SFTP</td>
<td>SharePoint Online</td>
<td>Slack</td>
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<td>SMTP</td>
<td>SQL</td>
<td>Trello</td>
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<td>Twitter</td>
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Integrating IoT with a Line of Business Applications
Business Opportunity

Competition

Operated Gas Stations - Savon (Non Core Business)

New Casinos Coming in the Area

Fractured Customer Experience

Vendor Lock-in (Bally’s) – No Integration Strategy

Every Change Took Years

Not Agile
Loyalty 360 Solution

Look at Integration as a key differentiator to build a loyalty system

Loyalty points calculated by a points engine outside the vendor systems

All Systems became Customer Aware (Offer Loyalty discounts/Offers)

Phase 1 (Systems):
Gaming Kiosk, Retail, Restaurant, Spas

Phase 2 (Things):
Gas Stations
(Turned Savon Operated Gas Stations into avenue for getting new customers)

Phase 3 (Wearables):
In planning (Smart Bands, BLE, Phones)
Loyalty 360 Solution – (ESB View)
IOT is Disrupting Different Verticals

They are known by different names:

- **Oil and Gas**
  - Exception Based Surveillance

- **Field**
  - Smart Equipment Tracking

- **Manufacturing**
  - Intelligent Maintenance Systems, Industrial IOT

- **Transportation**
  - Intelligent Transportation

- **Utilities**
  - Smart meters

- **Health**
  - Wearables

- **Home**
  - Smart Home, Smart Garages

*How is IOT Changing your industry?*
IOT and Integration Roadshow Offer

IOT Integration Strategy
You have a specific use case - we help you figure out your IOT strategy

Enterprise Nervous System Roadmap
You want us to look at what you have and figure out what your ENS Roadmap should be

Cloud Integration Strategy
You systems and integration are primarily on premise but now would like to augment with cloud capabilities
Panel Q & A

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Survey Forms
Why Do You Need an Digital Integration?

A company that implements an “digital integration” can respond to changing conditions quickly because all people and automated systems have situation awareness.