

OSU & WSO2: A Decade+ Journey in Integration & Innovation

WSO2Con 2024

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OSU Background

- Total Student Enrollment: 65K
- Faculty/Staff Numbers: 53K plus
  - Intermittent/Seasonal : ~5K
  - Nonemployee.: ~6k



6 campuses across the state that provide enriching educational experiences

88. Ohio State Extension offices contribute to communities in every Ohio county

#1 Columbus, Ohio, is the fastest-growing metropolitan area in the Midwest



My Service Areas

Integration Enablement

Data Engineering

Enterprise **A**rchitecture

Agenda

- Beginning
- Present Day
- Near Future
- Summary

Beginning: 2010-2015…

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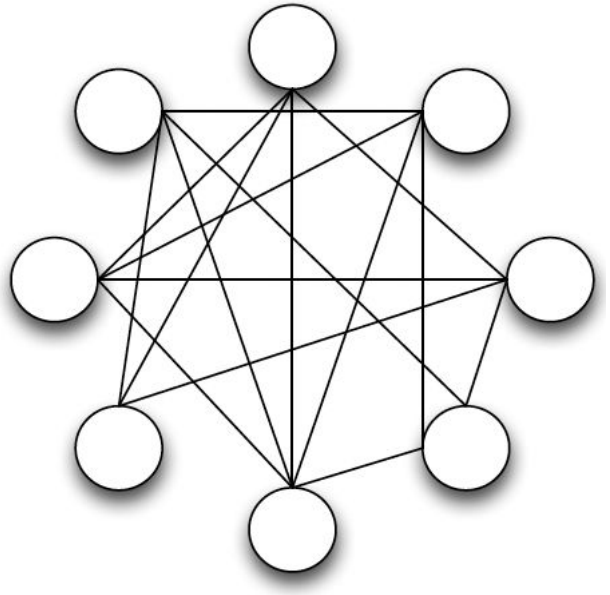
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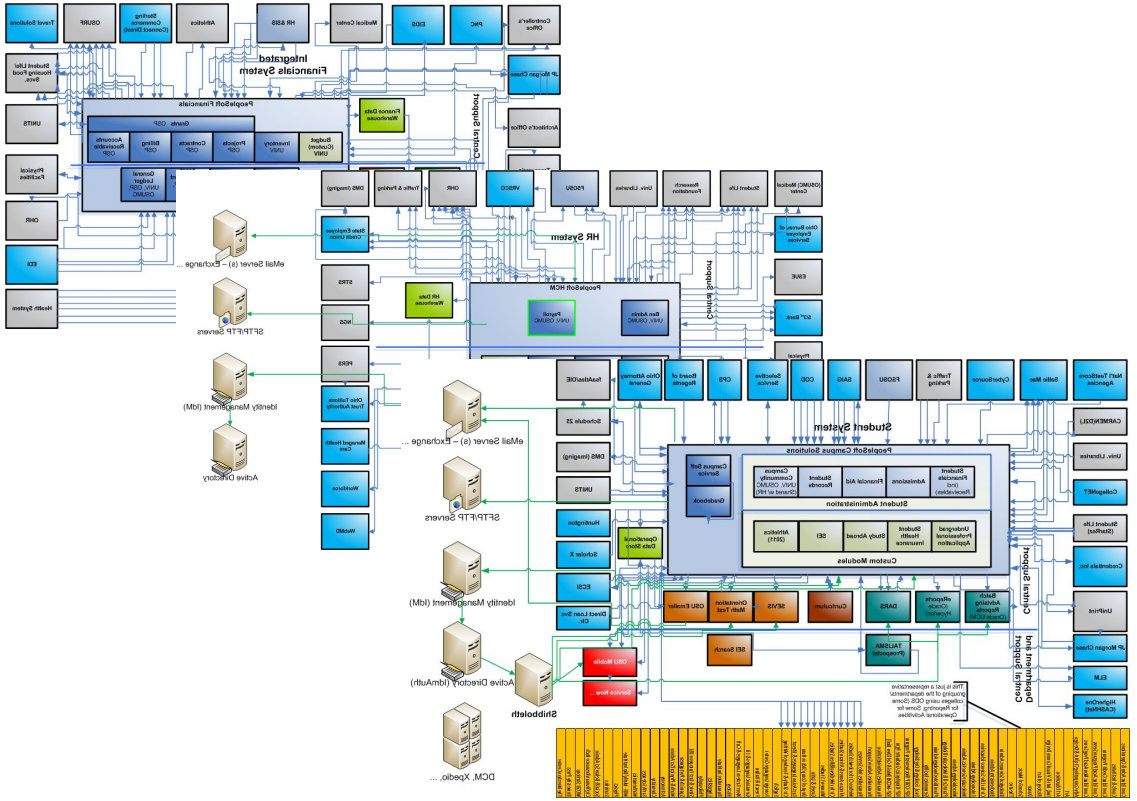
Beginning: Initiators

- Based on small wins that had big impacts:
  - Web Services for real-time grade, schedule, and enrollment information
  - Enables faculty to post grades in real-time vs Uploading excel spreadsheets via integration(s)
  - Moving University Library to use new integration for Person info. (near real-time) vs Batch (day+ old)
  - Success in getting other developers to build web services

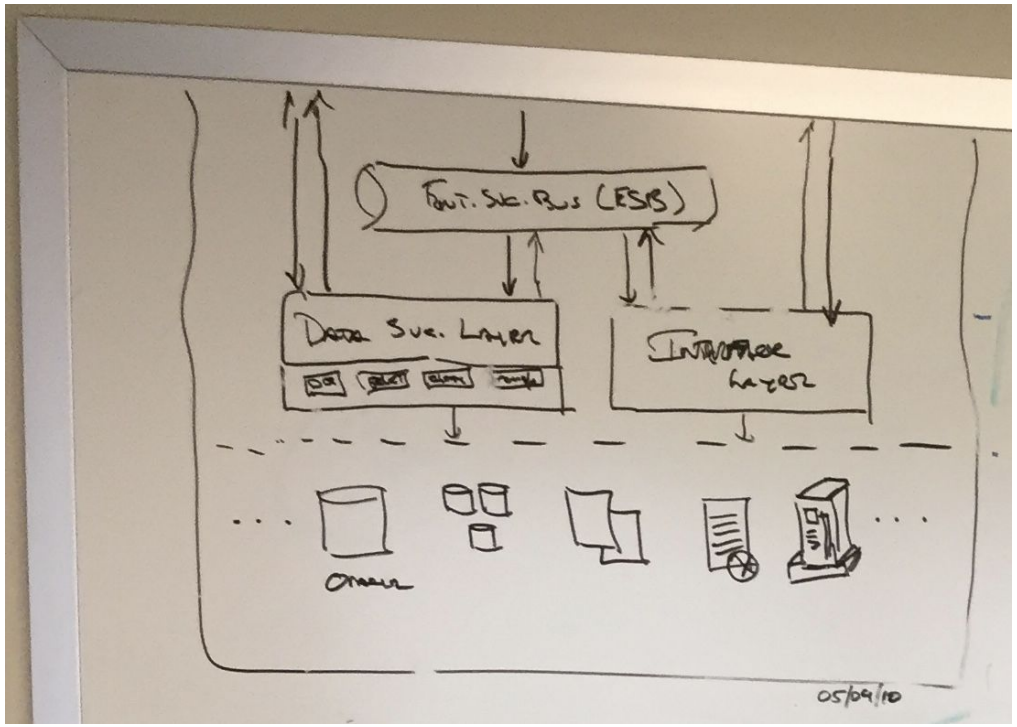
- Started to look into SOA Architecture with other universities
- Needed to find better & efficient ways of access to information w/o increasing accounts in core systems

Hairball & Duplicated Integrations





Beginning: Research, Zoom Calls, etc.





Enterprise Service Bus (ESB) - Product Analysis

-Glenn E. Donaldson, OSU

In researching the ESBs, I have come across multiple commercial and open source products. However, for the purposes of our Integration Architecture movement, we need to narrow the focus to a few key products. Below I have described the research activities and sources I used in narrow the ESB selections.

Research

Based on my experience, research, and information gathering from colleagues the ESBs I began to look at in more detail were the following:

- WSO2
- **Mule**
- Fuse ESB
- **JBoss ESB**

On the commercial front, the Oracle Service Bus was presented to us in various ways (briefings, emails, meetings…). While the product(s) seem mature, the cost to implement the multiple pieces of the Oracle platform can be substantial.

IBM has an ESB offering, however, like Oracle we would need to be prepared to fund the investment.

Forrester:

Forrester has performed multiple detailed evaluations of ESBs, both commercial and open source, over the years. The latest report "The Forrester Wave" – Q2 2011 states that from the commercial perspective the ESB leaders in their scoring order:

1. Software AG's - webMethods ESB
2. Tibco Software – Tibco ActiveMatrix Service Bus
3. Oracle Service Bus
4. IBM's multiple offerings

From the Open Source leaders:

1. FuseSource – Fuse ESB, which is based on Apache ServiceMix, Apache Camel, Apache CXF…
2. WSO2 – WSo2 ESB and its companion components
3. MuleSoft – Mule ESB
4. Red Hat – JBoss ESB

The Forrester evaluation was based on 109 criteria group into three high-level buckets:

- Current Offering

DRAFT

Beginning: Challenges

- Lack of support from varying levels within organization
  - People fear what they do not understand
  - Many developers were no-low-code technical types
  - Traditional or easier solutions instead of “right” ones
- ERP systems like PeopleSoft held most of the focus/resources

- Order taking instead of collaboration or partnership
- Finding interested/capable people took time
- Data Stewards need(ed) convinced to ”free” data
- Teams/Orgs not knowing where or how to

Beginning: Accomplishments

- Introducing: Enterprise Integration Platform [EIP] Effort
- Created EIP DevOps team (cross-unit) for WSO2 Implementation
- Implemented EIP: Nov. 2014 – June 2015 (Go-Live)
  - Existing Services from Student Info. Services days hosted in WSO2 ESB (EI)
  - Enabled Shibboleth/SAML Auth for Consoles
  - Moved all PeopleSoft Finance web services to our platform
- Add more users & integrations
- Reduced Direct Database Access
- Asked be prepared for Workday Project and the integrations forthcoming/scale
  - **Key Challenge**: Move from Tier 1 to Tier 0 system

Present Day: 2017-2023…

Present Day: In the Middle of Things

2017/2018

- Attended **WSO2Con 2017** in San Francisco
- Early Adopters of **Ballerina**
- Created strategy for Moving from VMs to **Kubernetes (K8s)/Docker/etc. - DIY**
- Started doing Roadshows, more conferences, etc.
- More Integrations….

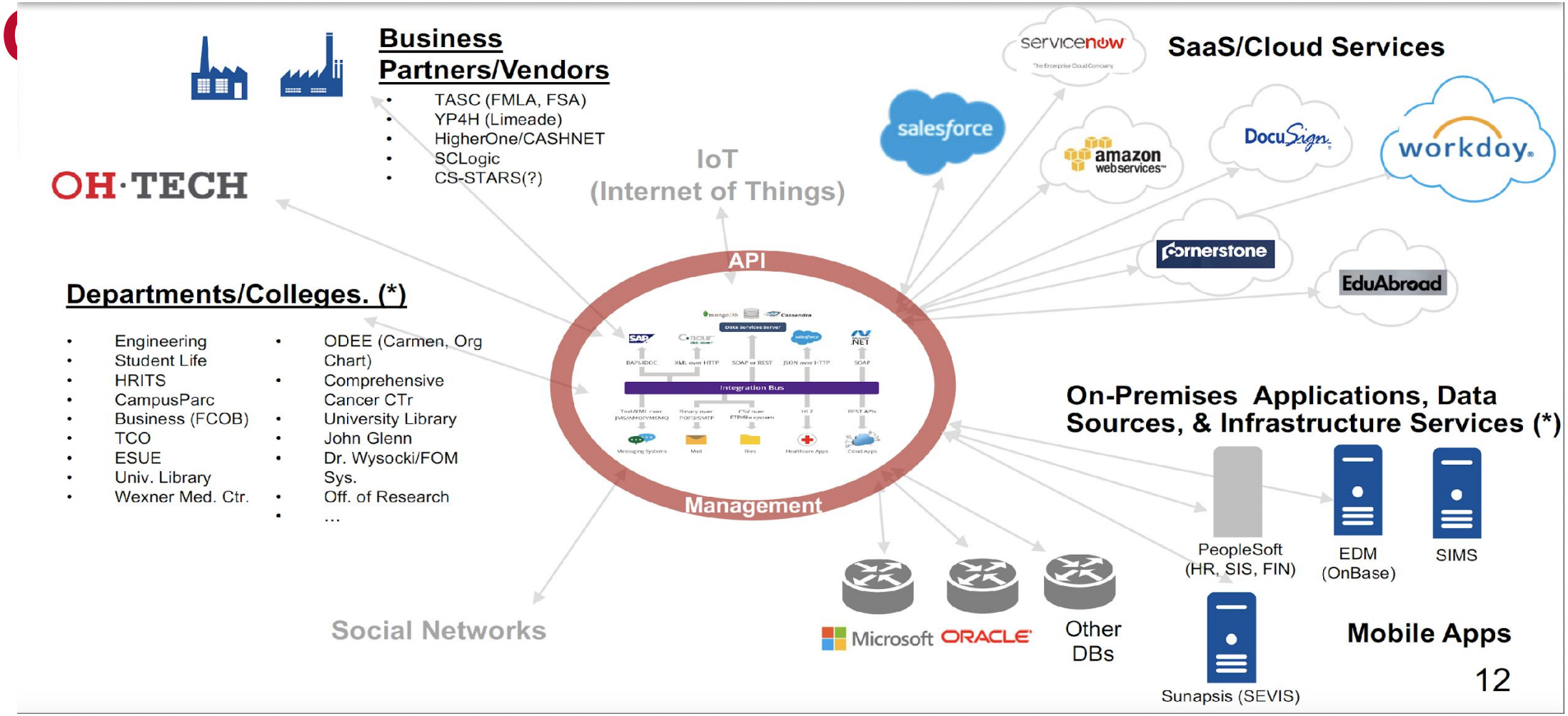
2019–2021: THE COVID & WORKDAY YEARS

- **Workday Developer Training** Trained WD Devs. To use WSO2 Dev. Studio, GitLab, EI, APIM with SOAP and REST integrations for Workday effort
- **Student Capstone** for Engineering Seniors; 3 students worked with WSO2 products, AWS, and Workday data and Won Best project for the Fall Term 2019.
- Held Columbus, OH based Meetups for Microservices (Ballerina, etc.) w/WSO2 as Sponsor
- During **Covid –** The need for integration access increased due to transition to at-home business, teaching, etc.

2021 – 2023: ON THE COMEBACK

- Continual Improvement of current environment
- **Hired DevOp/Platform Engineering Student Workers** to learn our environment; learn ballerina, start student pipeline
- As part of Enterprise Architecture Partnership with our University Medical Center, we started sharing, giving access, partnering on integration solutions
- Inherited the Data Engineering team

Present Day: Connected Systems &



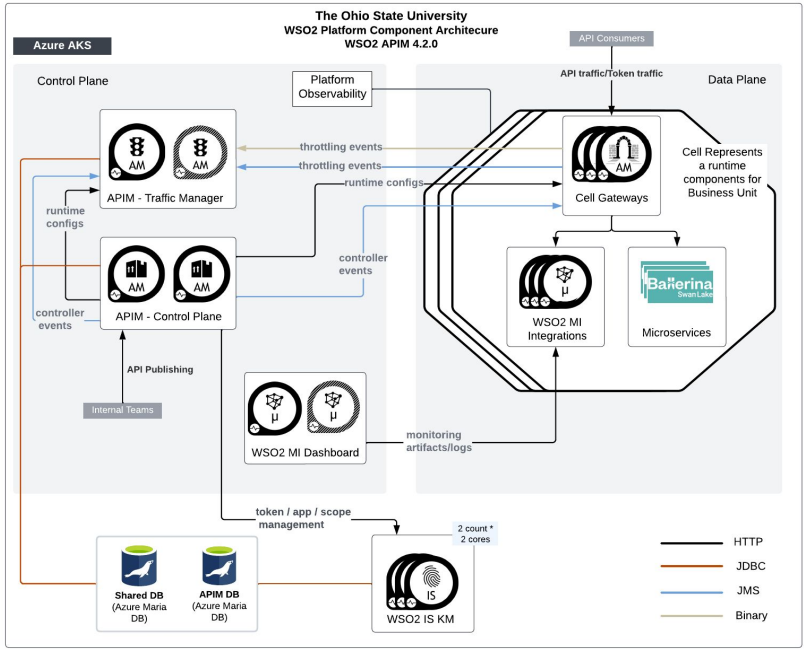
Present Data: Continual Sharing/Learning

- **Shared Development** —If departments/colleges were willing, we would teach them Ballerina, etc. so they could maintain integrations using their systems.
- **Continuous improvement**— We started transitioning older Ballerina code to Swan Lake; Upgraded K8s, etc.
- **Aligning Technologies** – Data Management/Engineering team learning and using like tools, integrations, and solutions;
- **Outreach/Awareness/Usage**—We are what we have done as part of our Ent. Arch. Solutions/artifacts; Developers are enabled to “shop” for APIs to use in their applications

Near Future: 2024 & Beyond

Near (now ☺) Future: Partnering w/ WSO2

- To Move our Integration Platform to **Choreo!!!**
- Get out of DIY K8S, at least for our Integration platform
- Key Actions:
  - Separate/isolate key workloads (i.e., Workday vs Everything else ☺)
  - Have Public vs Private Gateway(s)
  - Ballerina, CARs, and Micro Integrator(s).



Wrap-up

Take-away Summary

- **Small wins; Big Impacts**
- **Don’t be afraid to try - Be the change agent(s) you need. (***or Rogues in Context***)**
- Enable efficient & secure access to data
  - Data is a key currency
  - Without data & information you just have “Shiny”
  - AI anyone?
- **Engage and empower** like-minded, shared-vision, want-2-learn peeps.
- **Continual Improvement/Learning**
- Collaborate, Innovate, & Have Fun!

Cheers!!

Thank You!

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