Customized Service Platforms

Architectural Issues

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Architecture and Customization

What have we learned?

- Architecture plays an important role; it has implications for customizability
- But nothing particularly unique in this context. It depends on the ingredients that you pick and choose for a particular use case
- No end to what could potentially be done with services. In practice this potential is not fulfilled by current platforms/products/solutions.

Patterns

Static Feature Toggle #ifdef

Code Branches

Dynamic Feature Toggle if (config) {}

Strategy Pattern

Aspects

Mashups (Widget composition, personalization)

Plugin Extension Point

Dynamic Service Selection and Composition

Autonomic Controller

Customization Times

Delay taking architectural decisions so that taking them later will allow someone else to customize the architecture

Very Early (design time, select-integrate-test)

Early (compile)

- Deploy
- Startup (initialization)

Late (runtime before failure)

Very late (runtime after failure)

Customization and Interfaces

Functional Parameter (Interface allows to customize the service)

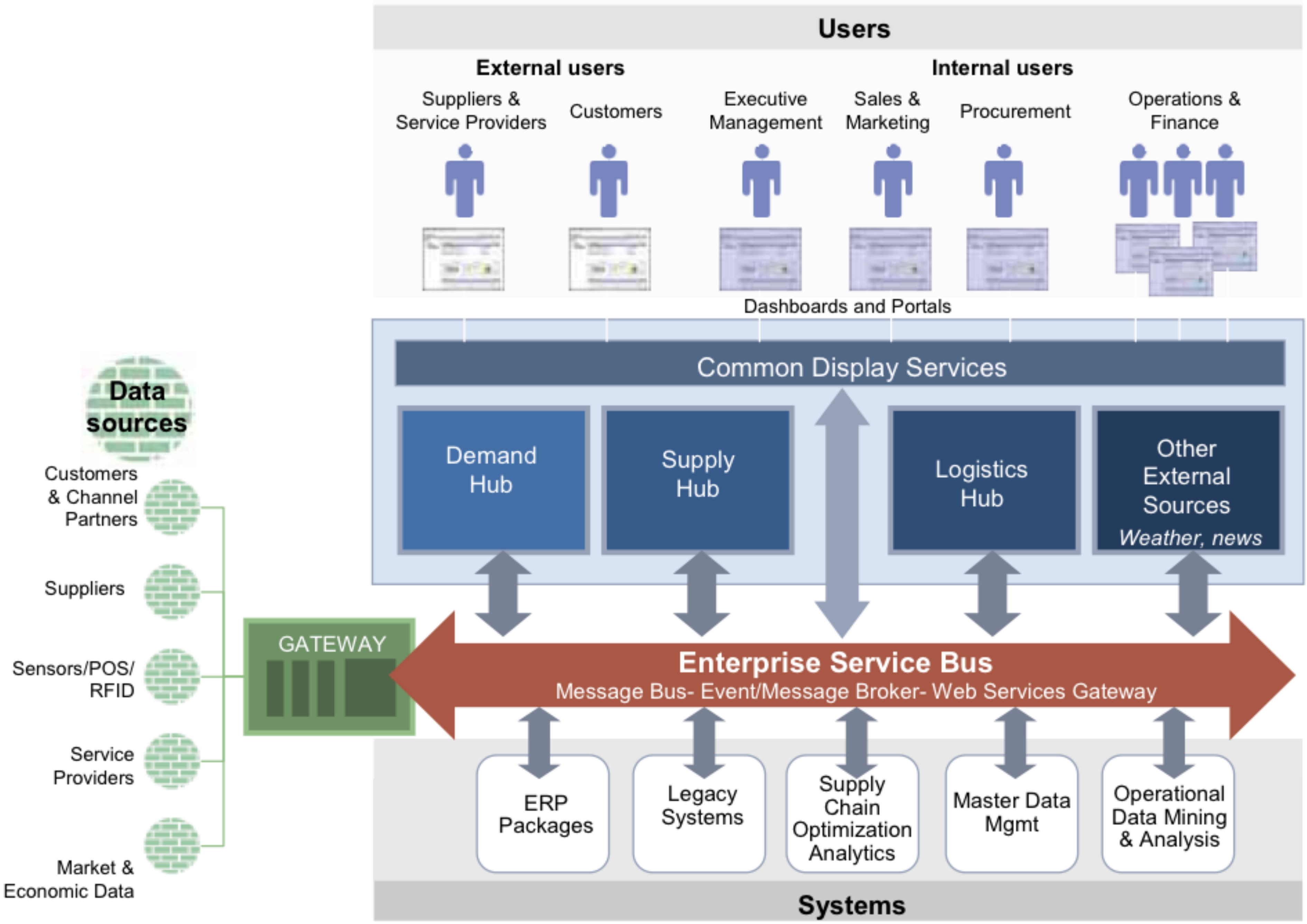
Non-Functional Parameter (Job submission metadata)

Orthogonal Concern (Service interface is not aware)

Platform Customizes the service based on Customer requirements, constraints, session, profile, negotiated pricing/billing deal

Reference Architecture

Slide from Patricia



Users

External users

Suppliers & Service Providers

Customers

Internal users

Executive Management

Sales & Marketing

Procurement

Operations & Finance

Dashboards and Portals

Common Display Services

Demand Hub

Supply Hub

Logistics Hub

Other External Sources

Weather, news

Data sources

Customers & Channel Partners

Suppliers

Sensors/POS/ RFID

Service Providers

Market & Economic Data

GATEWAY

Enterprise Service Bus

Message Bus- Event/Message Broker- Web Services Gateway

ERP Packages

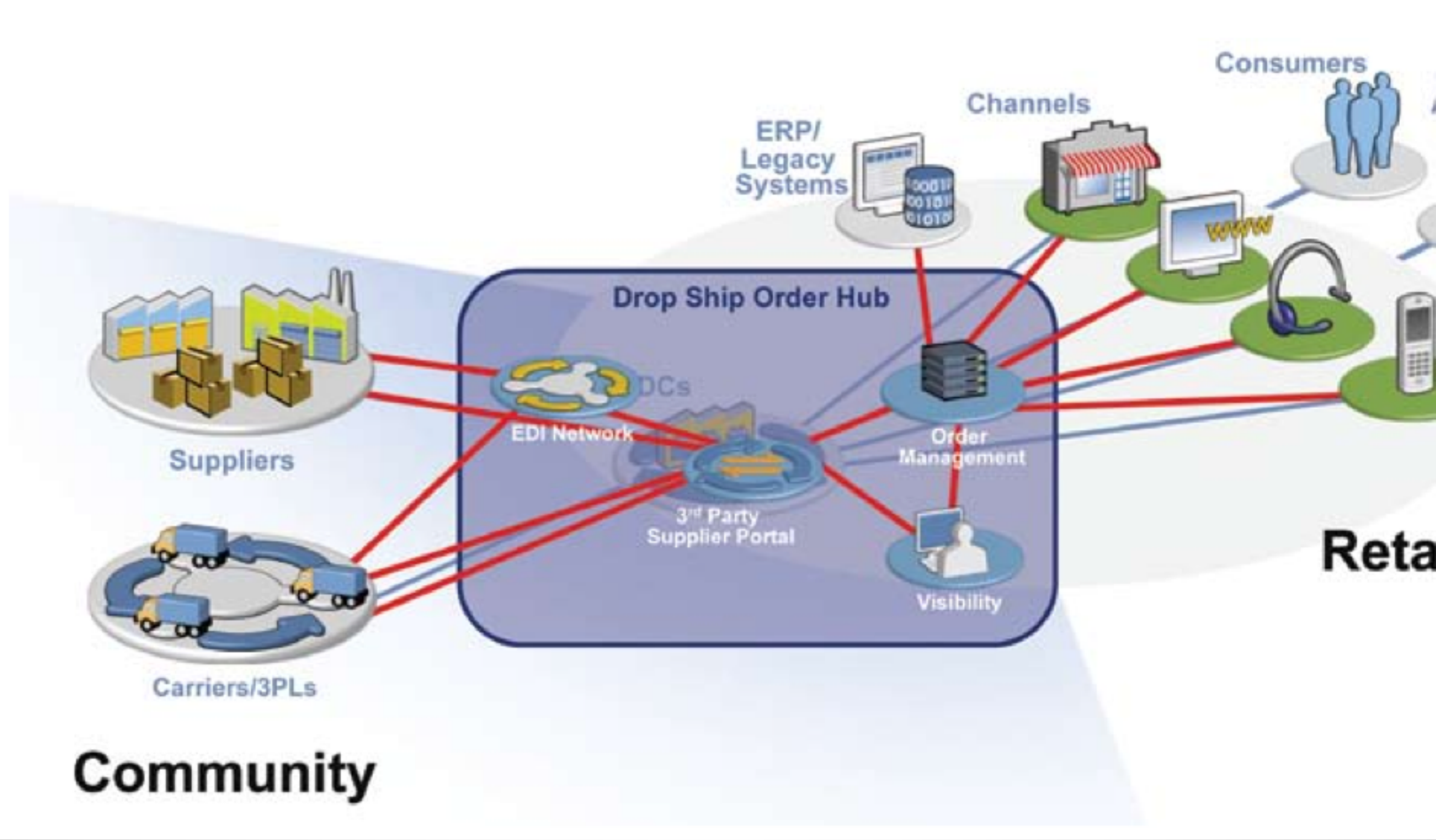
Legacy Systems

Supply Chain Optimization Analytics

Master Data Mgmt

Operational Data Mining & Analysis

Systems


Consumers
Channels
ERP/
Legacy
Systems
Drop Ship Order Hub
Suppliers
EDI Network
DCs
Order
Management
3rd Party
Supplier Portal
Visibility
Carriers/3PLs
Reta
Community

Runtime Customization Example Scenarios

Emergency Response

Share resources among multiple platforms to handle peaks in demand

A style for customization

Loose coupling

Fine-grained decomposition

Explicit variation points

Open Questions

How to distill an architectural style for customizable service-oriented architectures?

Conclusion

Customizability is a key quality attribute for software architectures

Customizability may break the service abstraction (since it requires consumers to control the service provisioning platform)

Control over customization expressiveness is important for industry acceptance

References