Your systems.
Working as one.

Federated Architectures for Next Generation Systems

Mark Carrier
Director of Market Development for Oil & Gas and Emerging Markets

Caution: Paradigm Shift

Innovation Requires New Paradigms

http://time.com/60505/this-1981-computer-magazine-cover-explains-why-were-so-bad-at-tech-predictions/

"…We tend to think that new products will be a lot like the ones we know. We shoehorn existing concepts where they don't belong. Often times, we don't dream big enough…"

What is a Federated Architecture?

Systems composed of distinct non-overlapping roles.

Federated pattern emphasizes a controlled sharing and exchange of information among autonomous components by communicating state.

Roles of a system are synchronized by objectives.

Synchronization is achieved by emphasizing a controlled sharing and exchange of information among autonomous components by observing state.

Autonomy is granted with accountability.

Objectives of roles can be fulfilled in any manner as long as they expectations are communicated using a common model and adhere to the expected behavior.

A Federated Approach to Problem Solving

Federated Solution
System is composed of distinct non-overlapping roles.

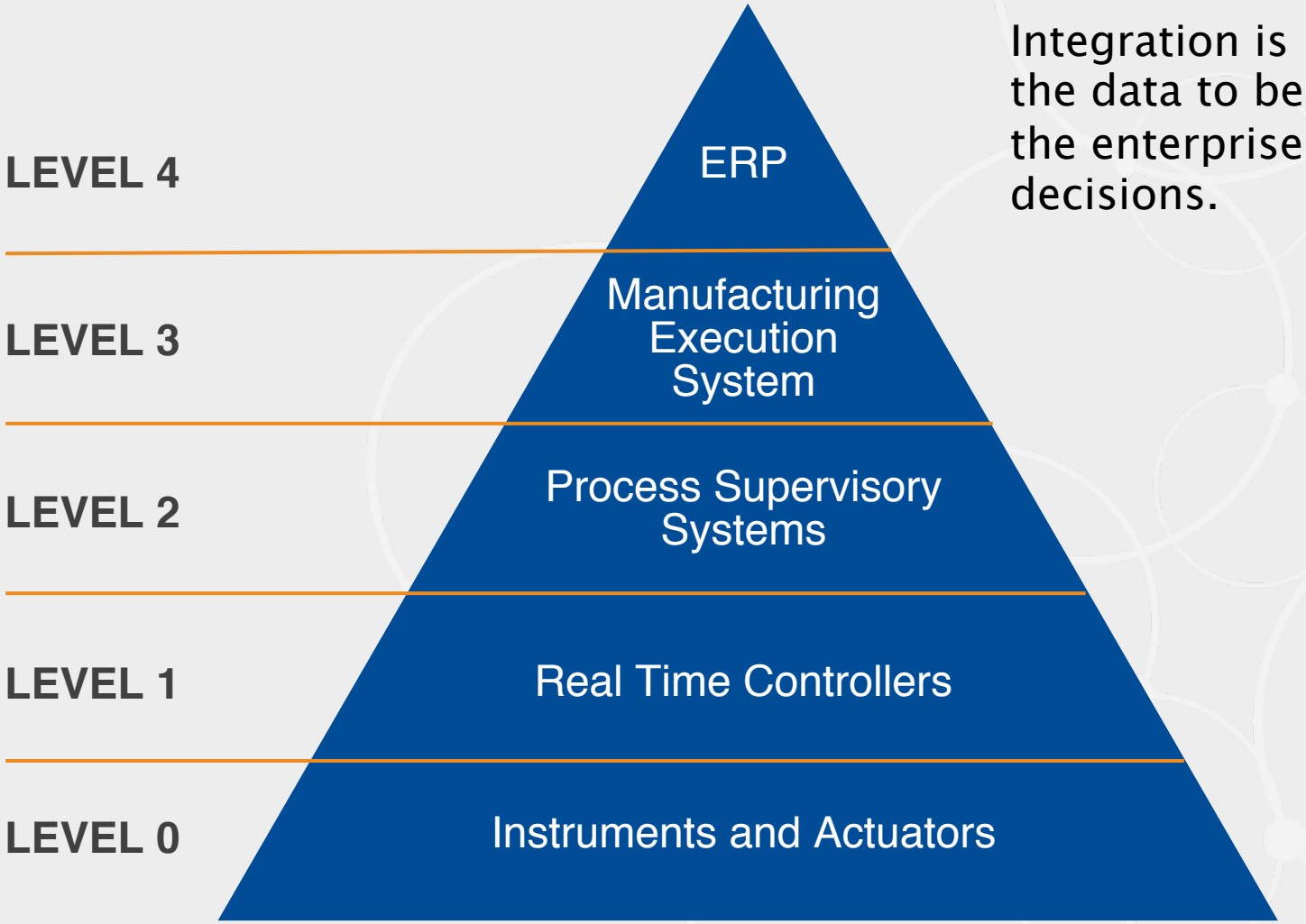
Objective
Service car in under 3 seconds

Highest Degree of Autonomy
Each team responsible for their specific role and takes full accountability in decision making.

Data-Centric
All team members receive the same information and extract what is important

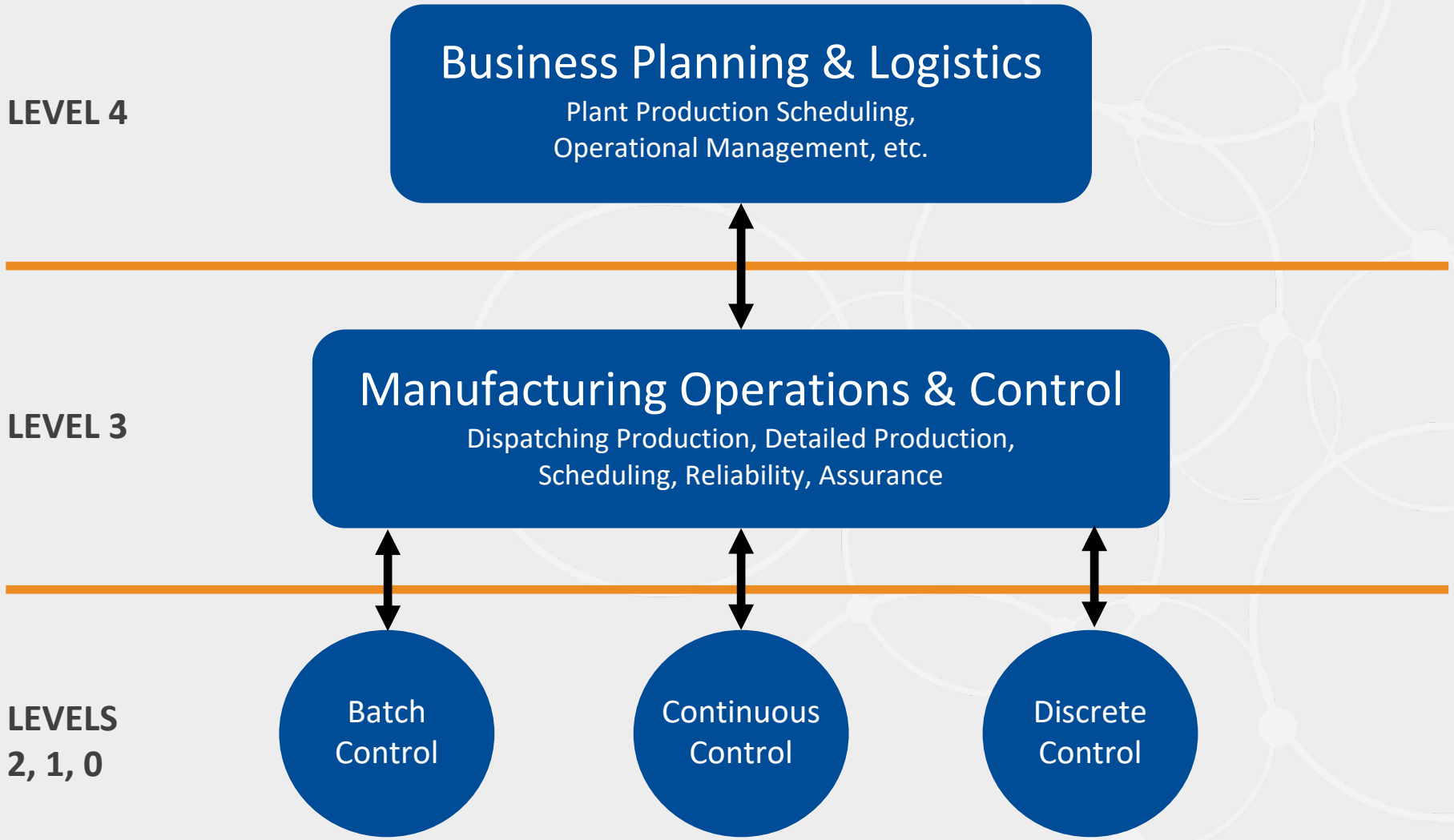
Posit: All Systems want to Federate

The Automation Pyramid

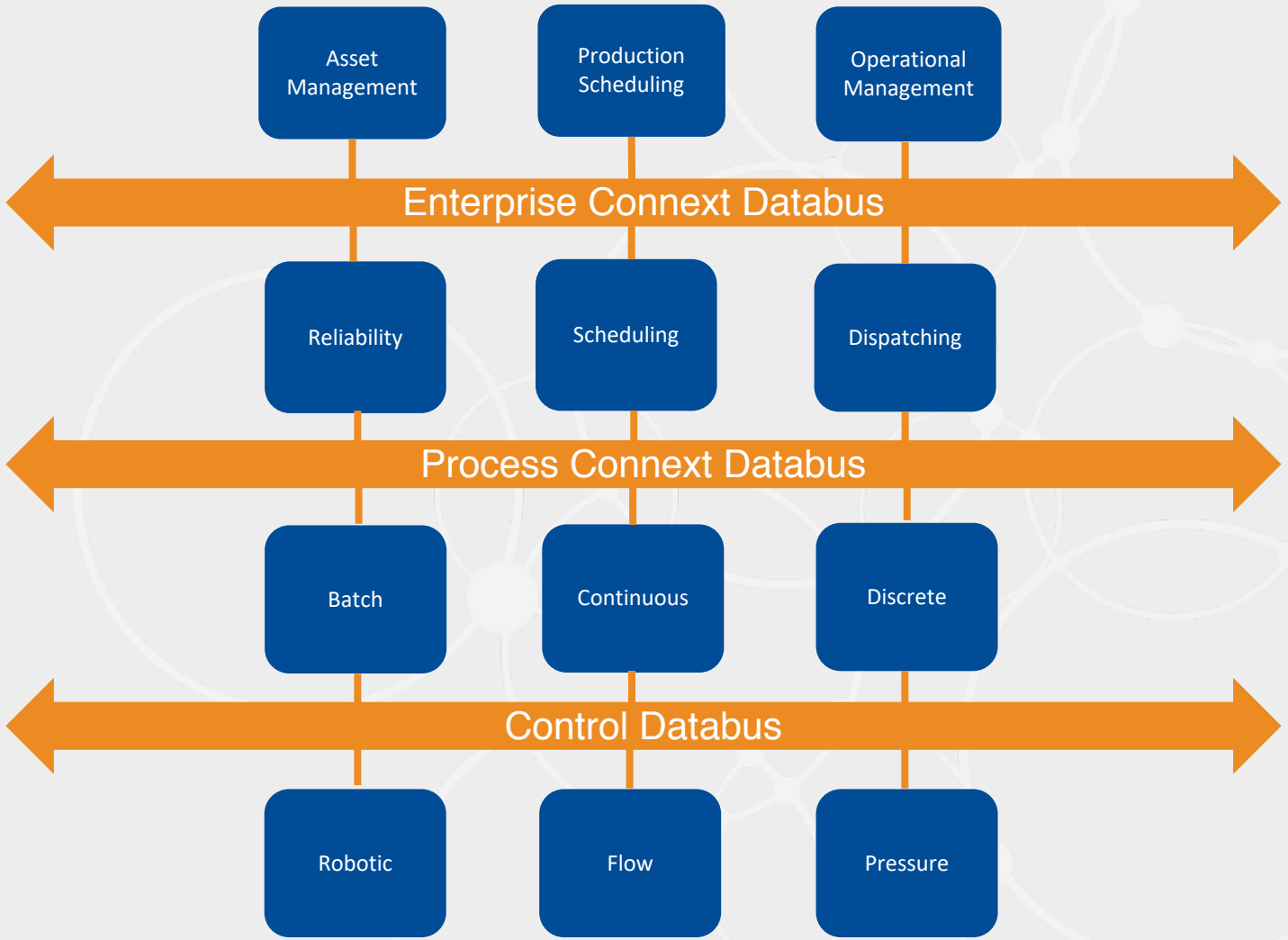


Integration is required in order for the data to be accessible throughout the enterprise to make real-time decisions.

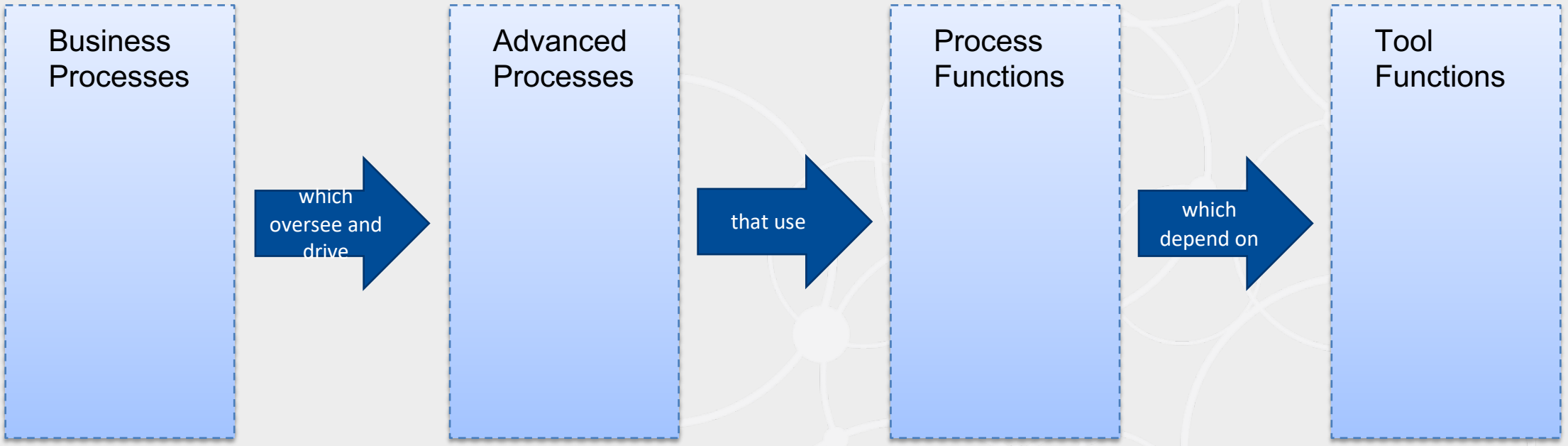
ISA95 Model



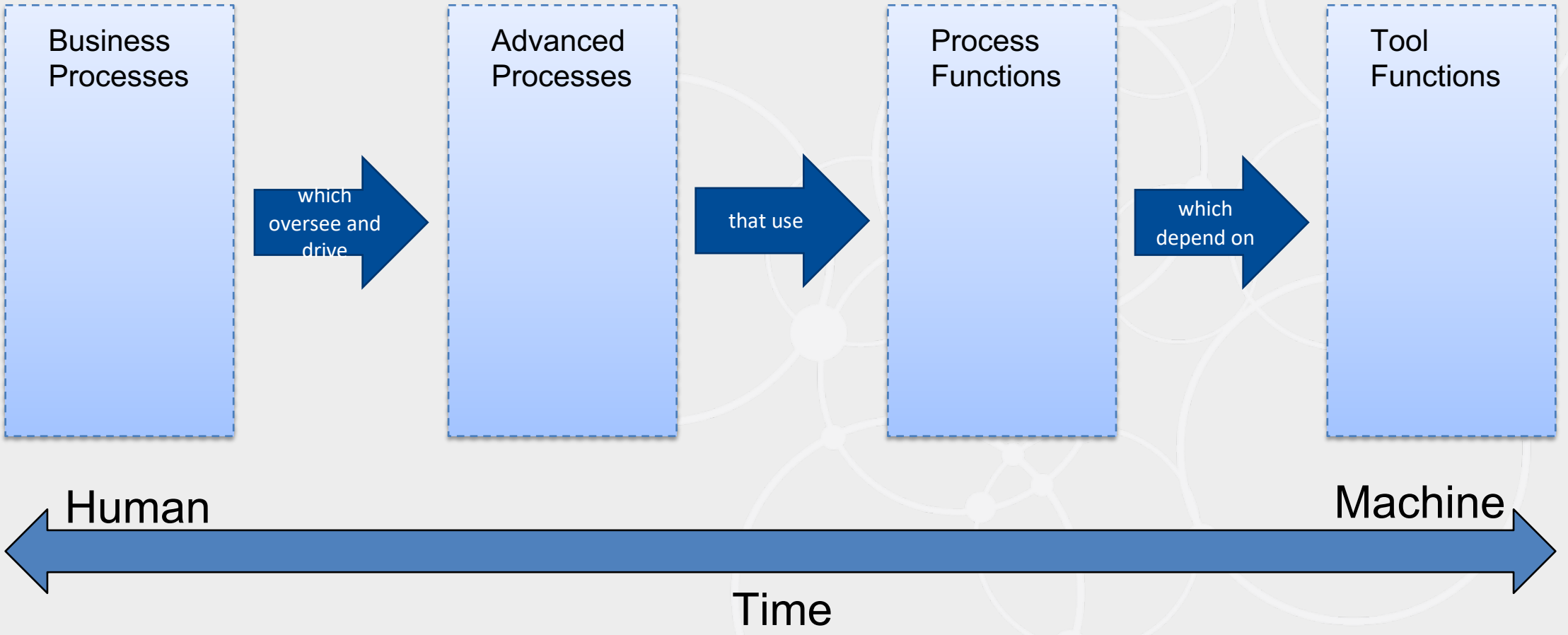
IIC Layered Databus Architecture



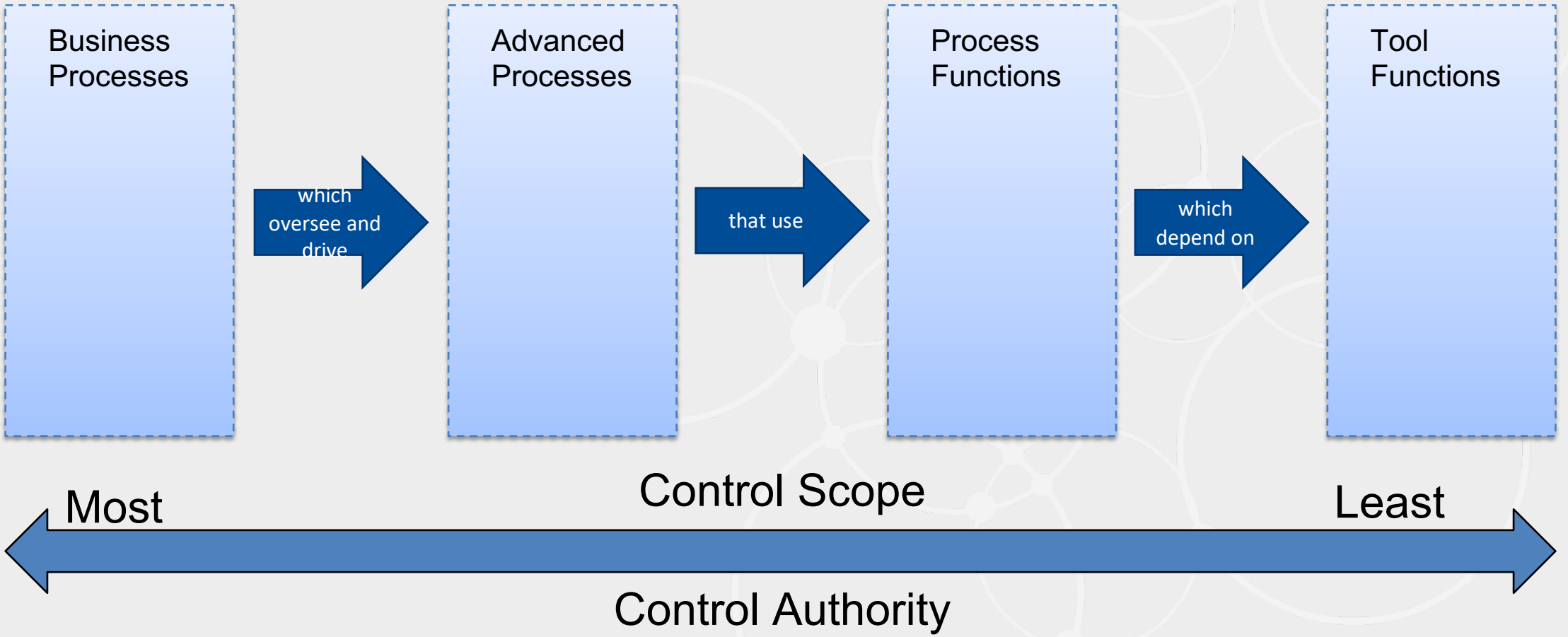
A Federated Hierarchy



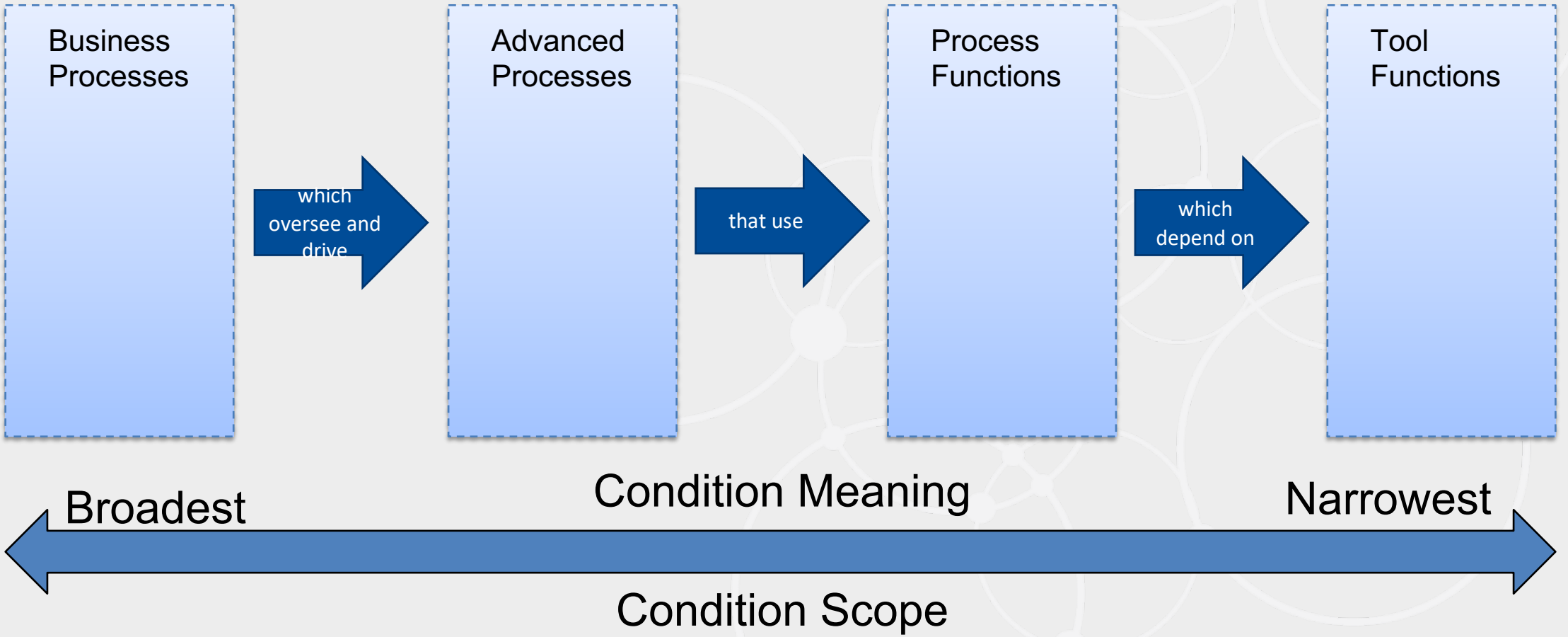
A Federated Hierarchy of Time



A Federated Hierarchy of Control

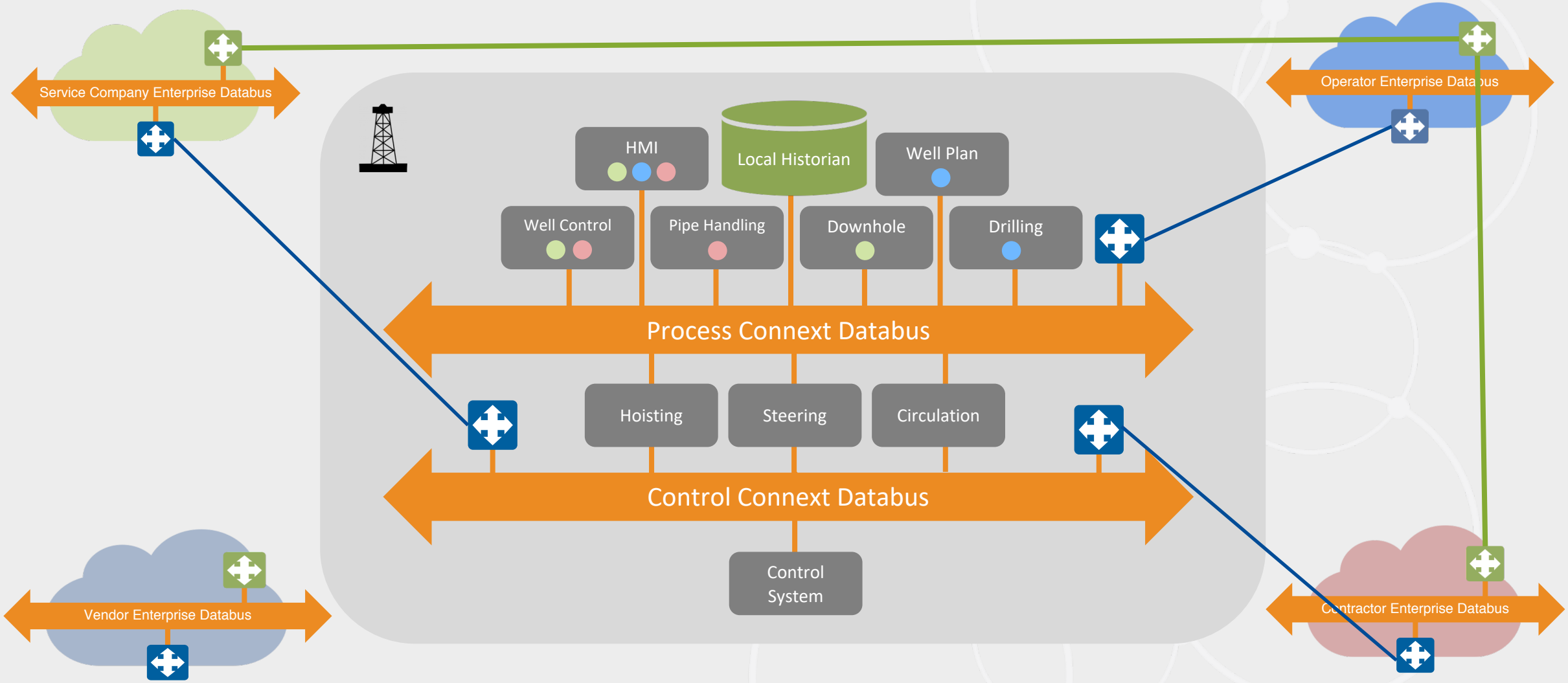


A Federated Hierarchy of Conditions



Federating on a Common Objective

Federating Roles Across the Industry



Conclusion

- Complex architectures are extremely hard to manage! Not only in terms of the architecture process, but in terms of getting buy-in from large numbers of stakeholders.
- RTI Connext

Thank you!

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