



## Deep Analytics

What is it and what makes it possible?

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- IT modernization and paradigm-shifting
- Implemented enterprise and inter-agency programs: Analytics/Data Management, SOA, BPM/BPR, Case Management, Portals
- Program Management & organizational capability development

# Challenge

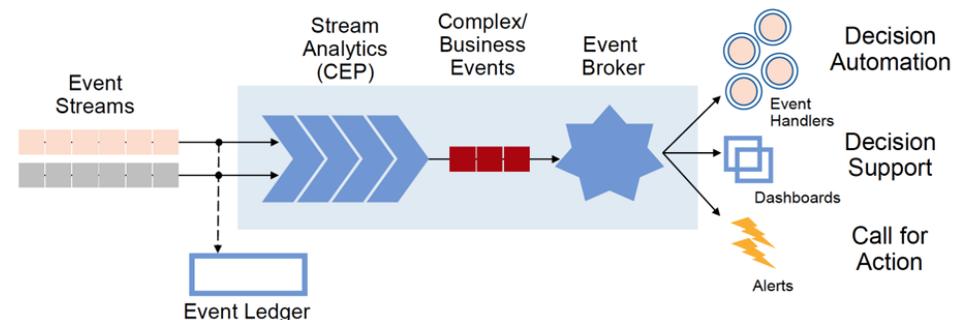
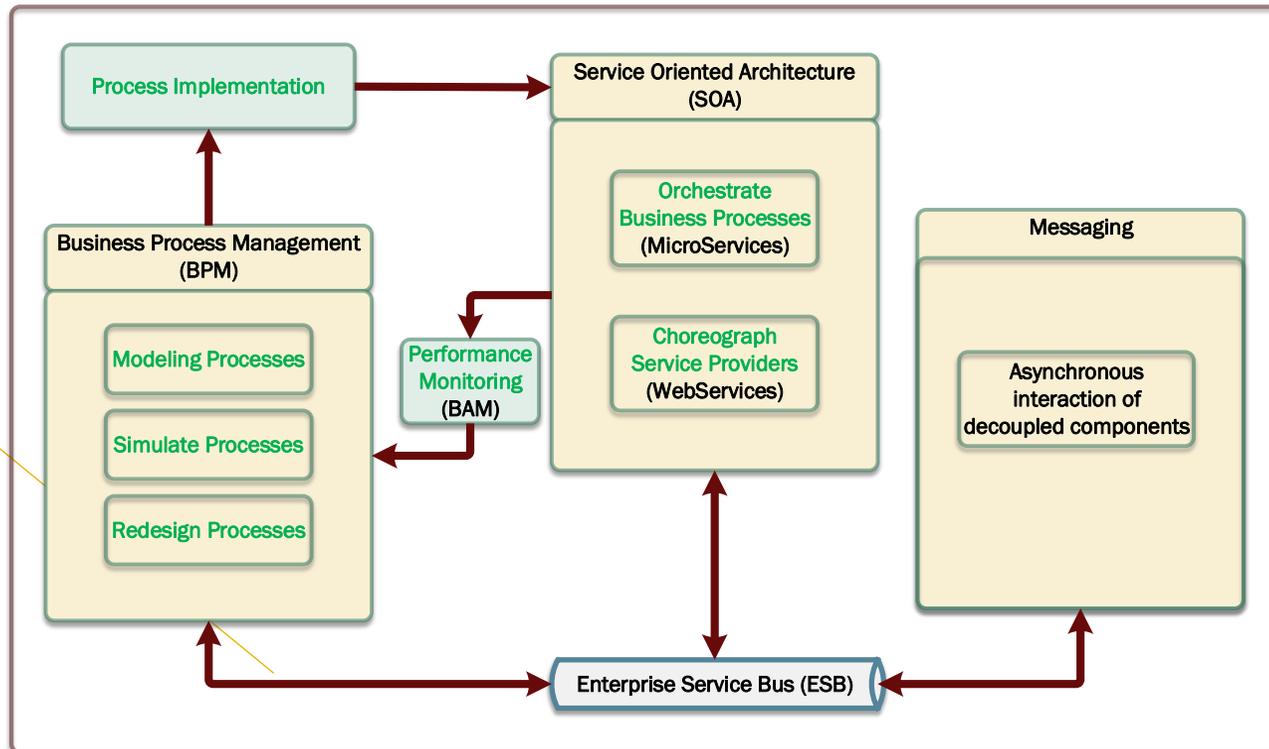
- Effective business operations depend on quality decision-making
- Quality decision-making depends on INFORMATION that is:
  - Accurate
  - Context-tailored
  - Timely retrieved by - or delivered to appropriate SME
    - “Timely retrieved by...”: no consistent reliability. Scenario serviced by traditional, “destinational” analytics solutions)
    - “Timely delivered to...”: consistent reliability. Scenario serviced by “Deep Analytics”

# Deep Analytics

- Contextual/context-tailored
- Embedded in business transactions
- Relies on condition/event-oriented listening and JIT transaction-rendering mechanisms
- Requires everything in a system to be readily calculable, trackable and traceable
- Calls for a number of architectural considerations to be applied to system design and implementation

# Service & Event-orientation

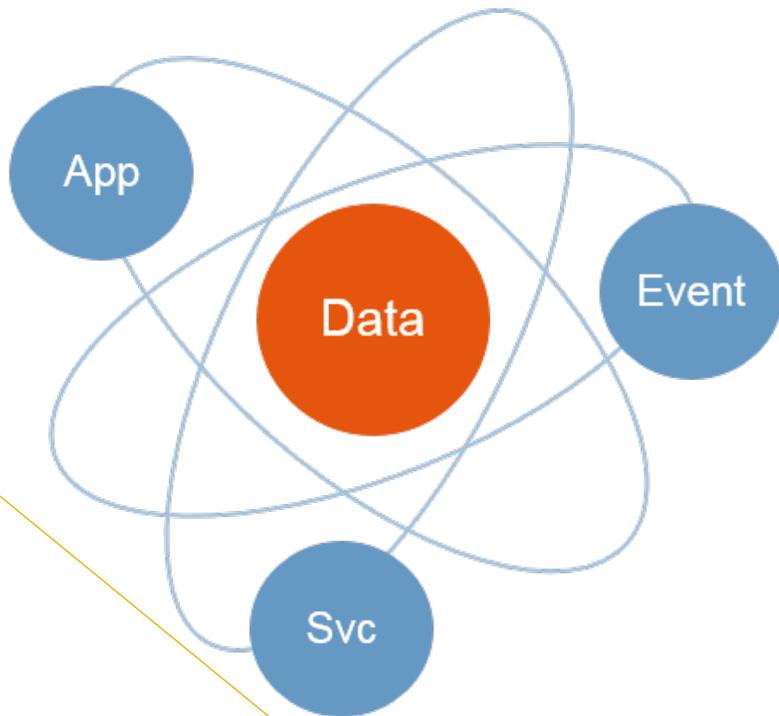
- Hybrid solution: ESB and Microservices complement each other
- Merging ESB and Microservices architectures facilitates the usage of a shared transport layer, a library of code artifacts that can easily be service-enabled as well as reuse of enterprise common services
- Supports both request-driven and event-driven architecture models
- Workflow/BPM capabilities
- Shiftable centrality: human, document, workflow



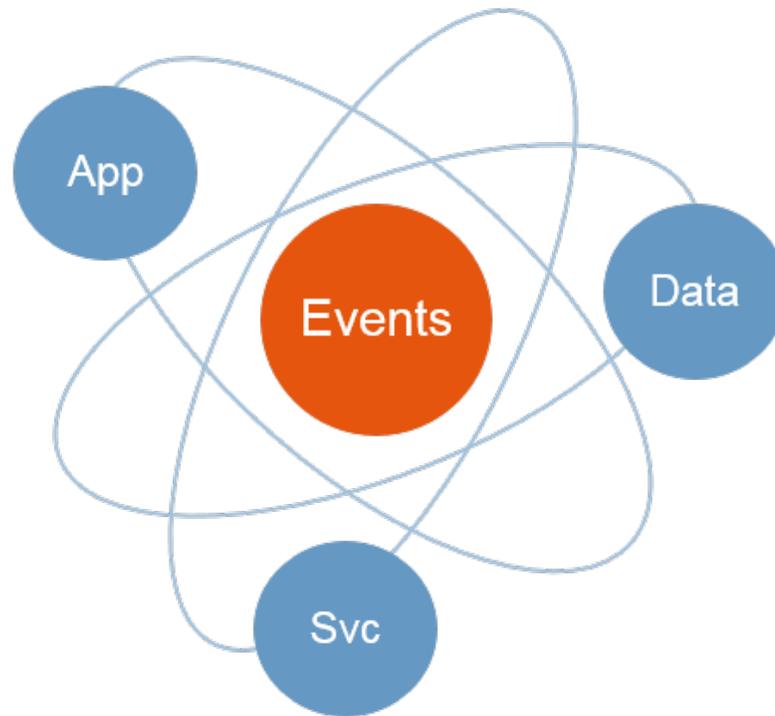
# Microservices – pragmatic SOA

		<b>Manageable</b>			
<b>Independent</b>					<b>Small</b>
	<b>Secure</b>		<b>Reusable</b>		
				<b>Atomic</b>	
		<b>Decoupled</b>			
	<b>Integrated</b>				<b>Standard</b>
<b>Testable</b>				<b>Scalable</b>	
			<b>Simple</b>		

# Data-centricity vs Event-centricity



**The source of truth is the data store.  
First priority: Preserve data**



**The source of truth is the log of events.  
First priority: React to events**

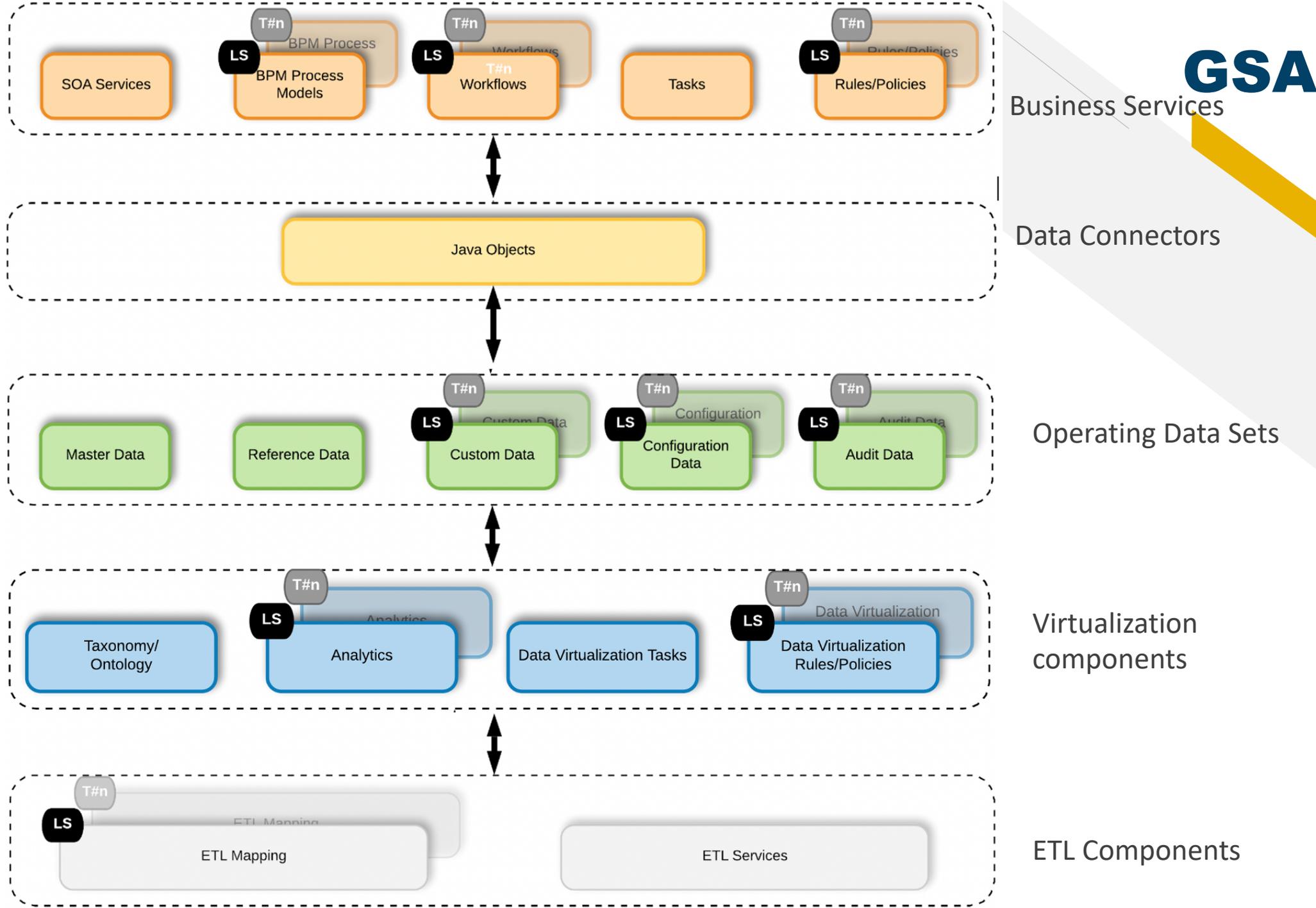
“To advance digital business from leading-edge projects to maturity, organizations will need to achieve consistent competence in event processing, decision management, contextualization and machine learning.”

- Both event-driven and event-sourced architectures are valuable for analytics and could be mutually complementing.
- Adaptive analytics

# Common Building Blocks (CBB)

- Common Building Block (CBB) is defined as “Common Building Block (CBB)” is high-level component abstraction encompassing a meaningful, definable area of major business functionality.
- CBBs represent pre-orchestrated combination of workflows, service calls, entry forms, security controls and rules related to a process/state.
- Use of the CBBs ensures centralized security control and minimizes tenant-level security risks.
- Use of CBBs supports physical and logical data segmentation at the application level, platform level, and across CBB to ensure data is not mixed with any other databases while allowing for enterprise and tenant / program reporting.
- Each CBB is developed as the highest-level reusable component with the ability to dynamically adjust itself to an unstructured process.

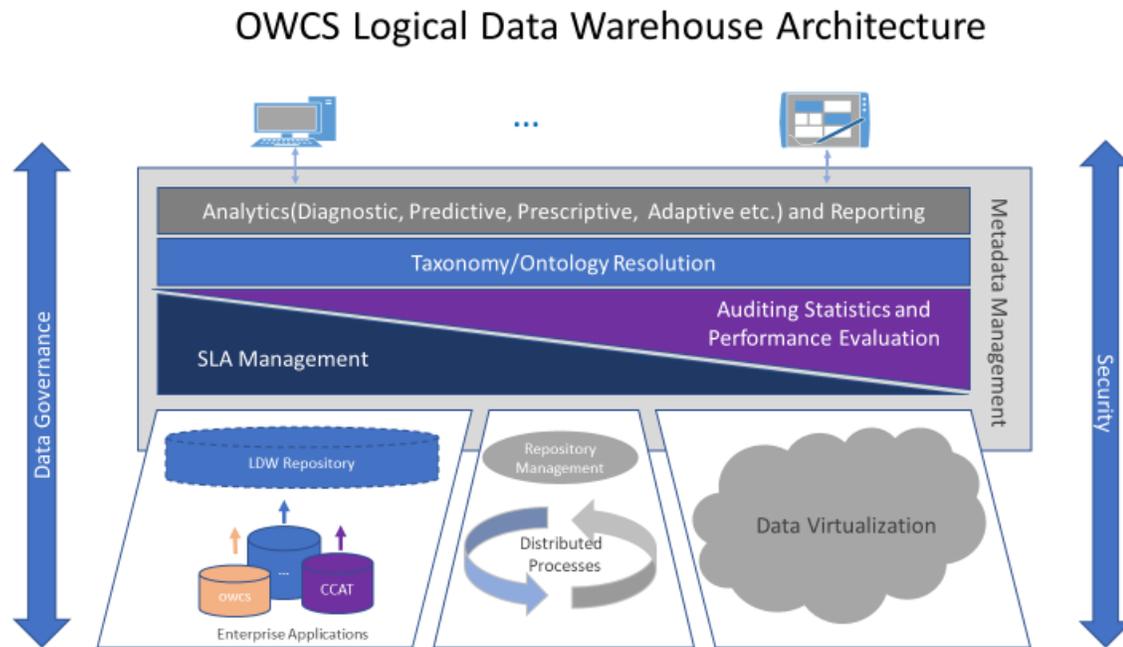
# Common Building Block (CBB)



# Plug-and-Play Modularity

- Ability replace one module in a model with another, without having to specify how the module's inputs/outputs interact with the rest of the model.
- Achieved by proper SOA, Microservices, and API Management design.
- All tiers should be designed based on common standards and be independent from the underlying technology, thus allowing to replace a technology while keeping each tier cohesive.
- Open standards
- Open source – first, when possible

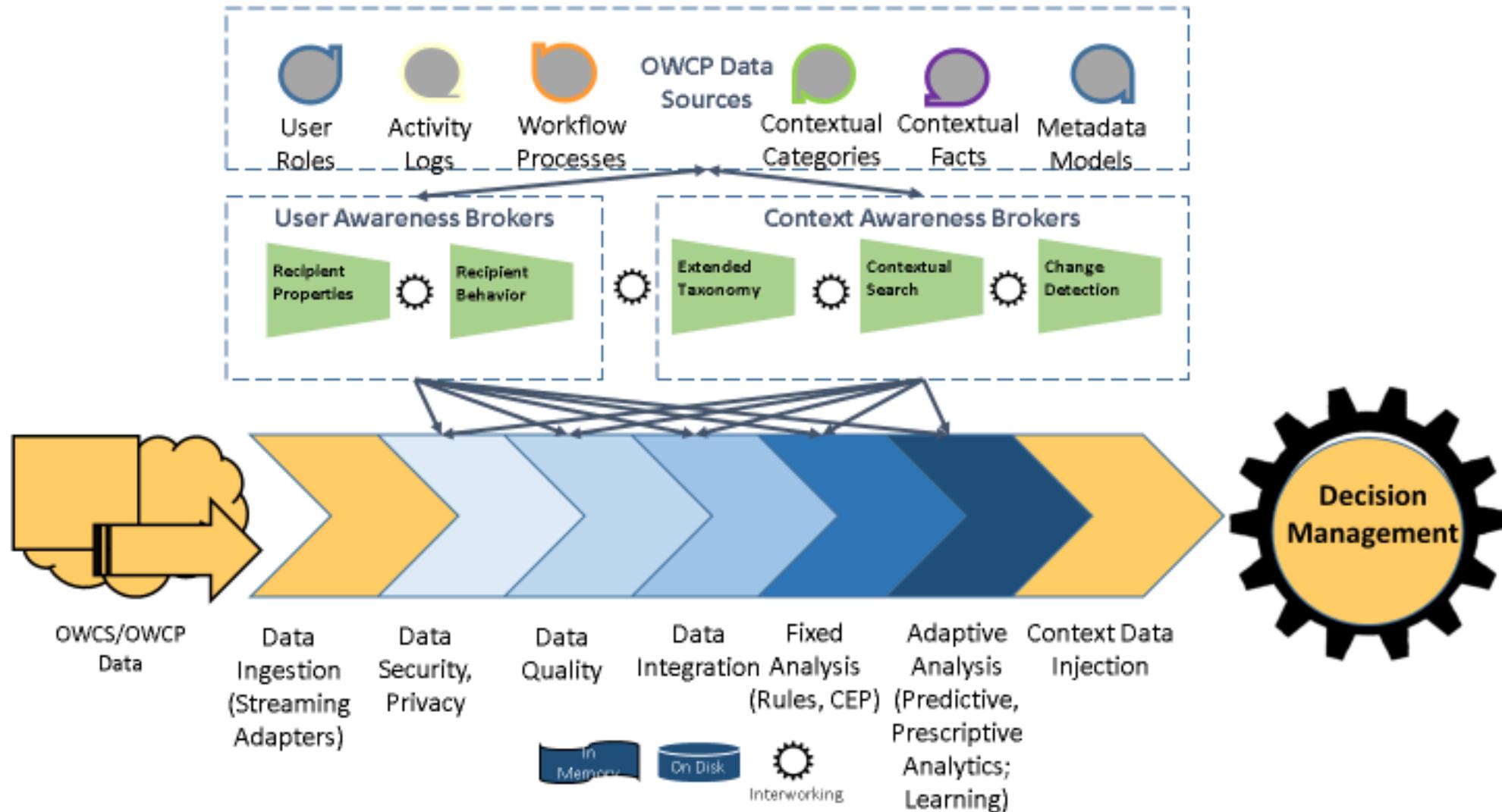
# Logical Data Warehouse (LDW)



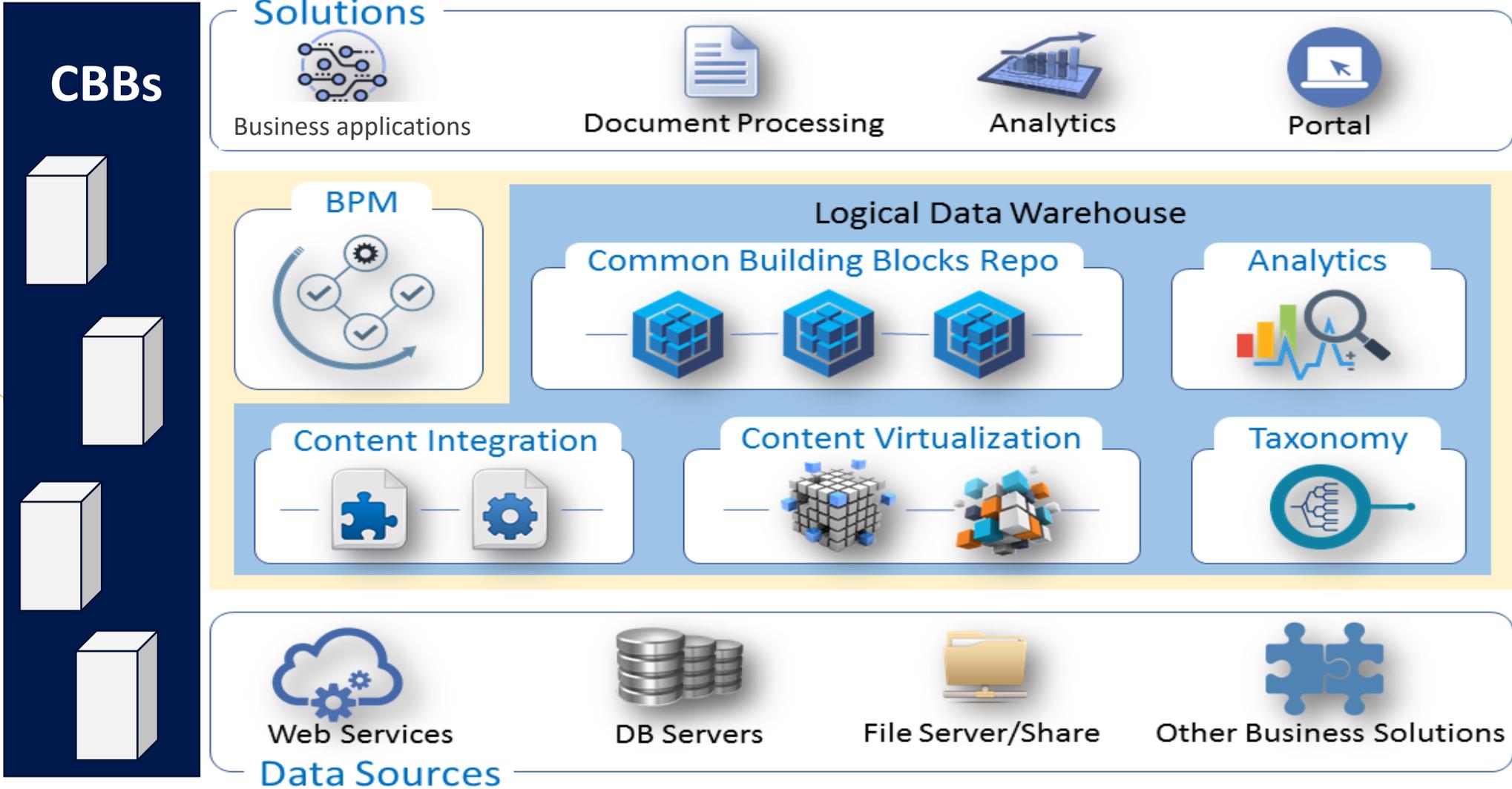
LDW supports the full range of analytics capabilities: Harnesses insights from both operational and strategic environments.

- Caters to heavyweight and lightweight Data Visualization tools.
- Self-Service Analytics including Individual Virtual Analytics Environment(I-VAE) as a sandbox type environment.
- Complex Data Analysis.
- Context-Aware, User-Aware, and Situation-aware Analytics.
- Diagnostic, Predictive, Prescriptive and Adaptive Analytics.
- Ability to leverage CEP data for even deeper insights and decision-making.
- Decision-Deriving Pipeline provides enterprise level of decision-making capabilities.

# Decision Deriving Pipeline



# Major architectural components and capabilities (conceptual & high-level)



# Key takeaways

- Architect for both data-centric and event-centric scenarios
- Express business functions through Common Building Blocks
- Approach ESB and Microservices as the best of both worlds
- Design SOA/SOI in conjunction with BPM
  - Framework must be flexible enough to allow tailoring the “human-document-workflow” ratios to each specific business objective
- Develop (or continue enhancing) a Logical Data Warehouse



# Thank You.



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