SOA Maturity Assessment using OSIMM

Presented by:

Andras R. Szakal

IBM Distinguished Engineer

VP & CTO, IBM US Federal SWG

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What You Will Learn

- The Open Group SOA Maturity Model (OSIMM)
- Customizing the OSIMM Maturity Framework
- How to conduct a SOA Maturity Assessment using OSIMM

(How to use OSIMM to facilitate an organizations approach to implementing SOA and obtaining stakeholder support)

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SOA Tutorials

The Impact of SOA on Business

Assessing Your Service Integration Maturity

SOA Governance

Architecting SOA

Developing an SOA with TOGAF

Implementing SOA

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Agenda

- ❑ **OSIMM Overview**

- ❑ DDB SOA Maturity Assessment using OSIMM

- ❑ Discussion

- ❑ Conclusions

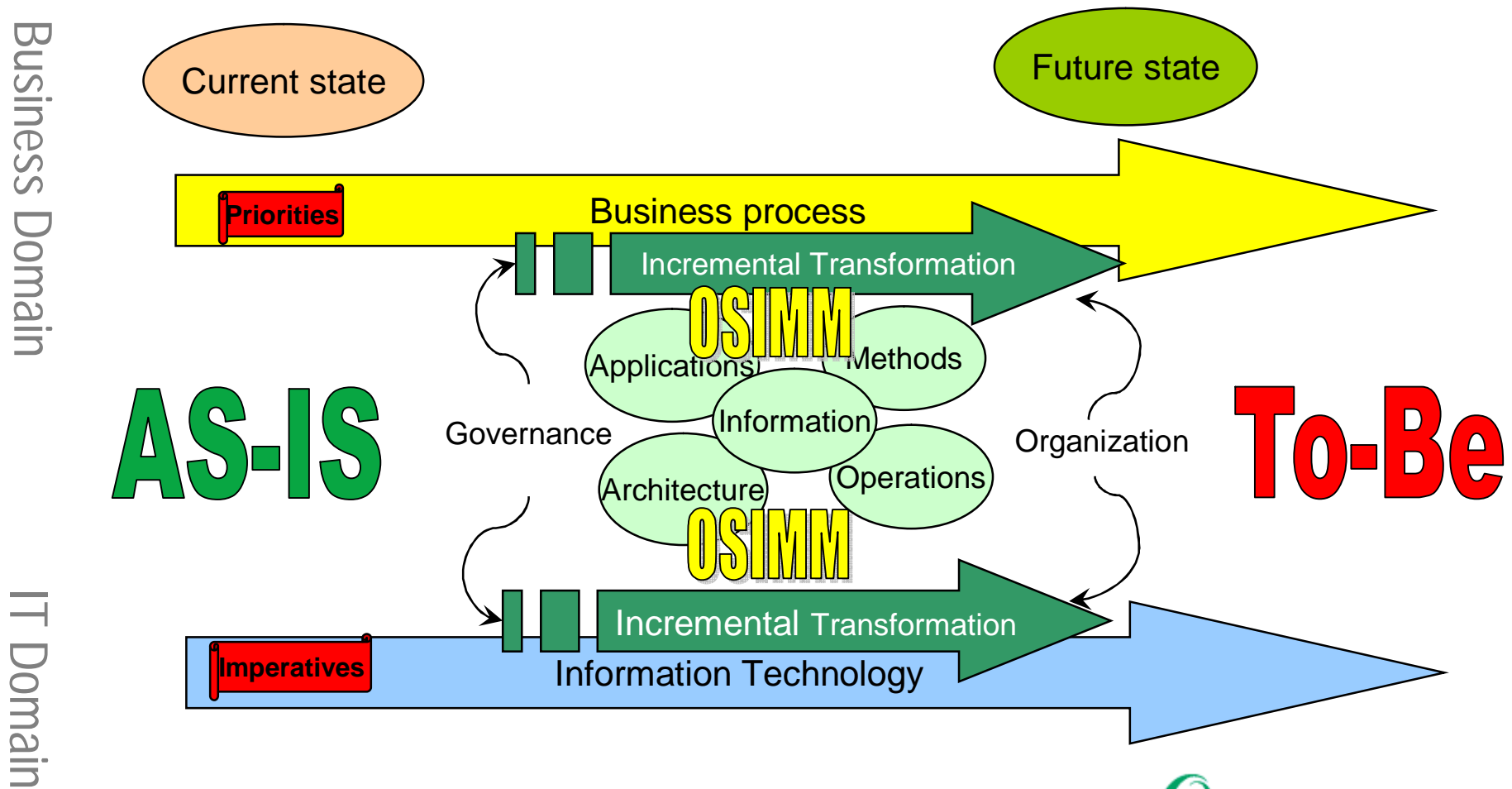*Illustrated through the application of SOA using the DDB Case Study*

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What is OSIMM?
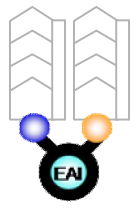
- Service integration maturity **model**

- An extensible maturity **framework**

- A **process** for maturity assessment

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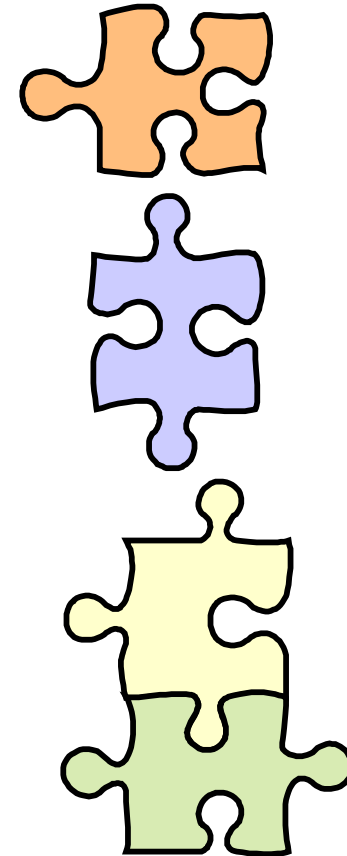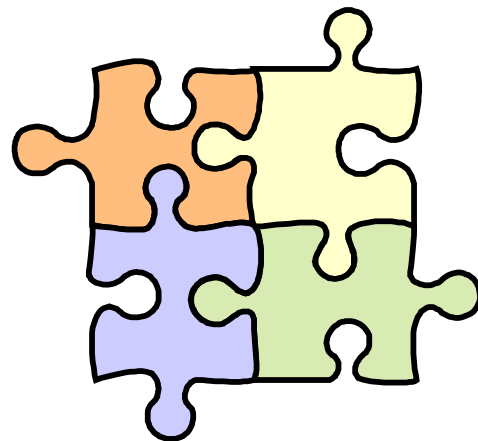
OSIMM helps define a roadmap for incremental IT transformation linked to business transformation

OSIMM Maturity Matrix

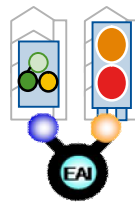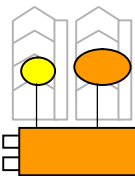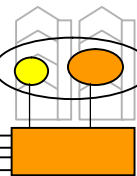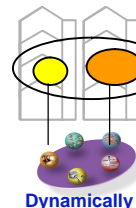|	Service Foundation Levels						
	Silo	**Integrated**	**Componentized**	**Services**	**Composite Services**	**Virtualized Services**	**Dynamically Re-Configurable Services**
Business View	Isolated Business Line Driven	Business Process Integration	Componentized Business Functions	Business provides & consumes services	Composed Business Services	Outsourced Services BPM & BAM	Business capabilities via context aware services
Governance & Organization	Ad hoc LOB IT Strategy and Governance	Object Oriented Modeling	Common Governance Processes	Emerging SOA governance	SOA and IT Governance Alignment	SOA and IT Infrastructure Governance alignment	Governance via Policy
Methods	Structured Analysis & Design	Object Oriented Modeling	Component Based Development	Service Oriented Modeling	Service Oriented Modeling	Service Oriented Modeling for Infrastructure	Business Process Modeling
Applications	Modules	Objects	Components	Services	Applications comprised of composite services	Process Integration via Service	Dynamic Application Assembly
Architecture	Monolithic Architecture	Layered Architecture	Component Architecture	Emerging SOA	SOA	Grid Enabled SOA	Dynamically Re-Configurable Architecture
Information	Application Specific Data Solution	LOB Specific (Data subject areas established)	Canonical Models.	Information as a Service	Enterprise Business Data Dictionary & Repository	Virtualized Data Services	Semantic Data Vocabularies
Infrastructure & Management	LOB Platform Specific	Enterprise Standards	Common Reusable Infrastructure	Project Based SOA Environment	Common SOA Environment	Virtual SOA Environment: Sense and Respond	Context-aware Event-based: Sense & Respond
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7

Example of Level 5 Architecture Domain Attributes

Using the RA to help define maturity

Fundamental Attributes

- Services Registry and Repository
- Business Processes are composite
- ESB is common
- Use of BPM / BPEL to define business services
- Common Security Services
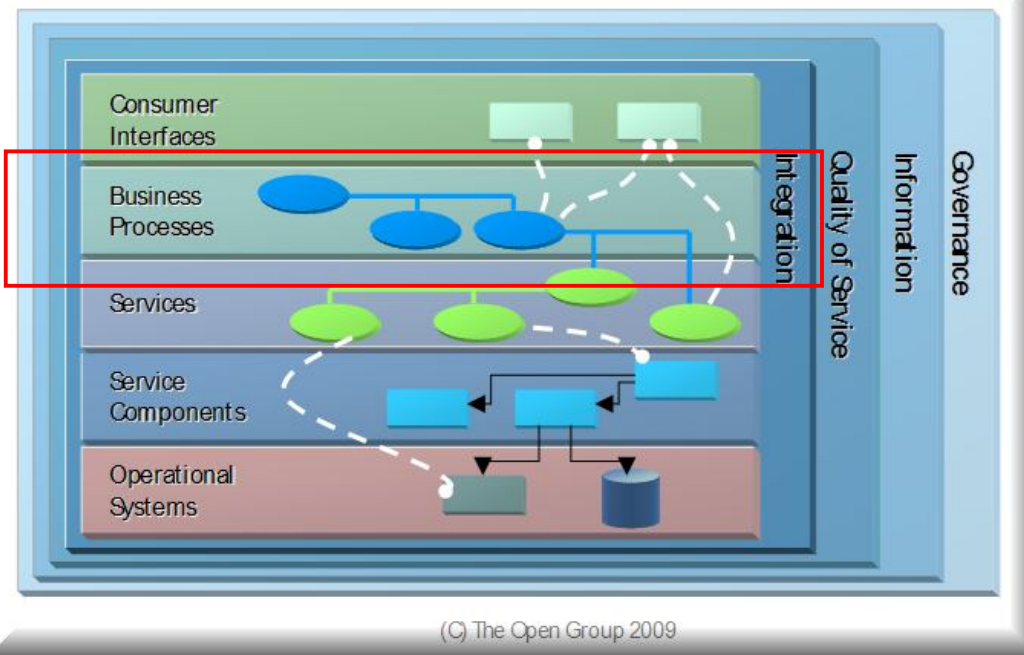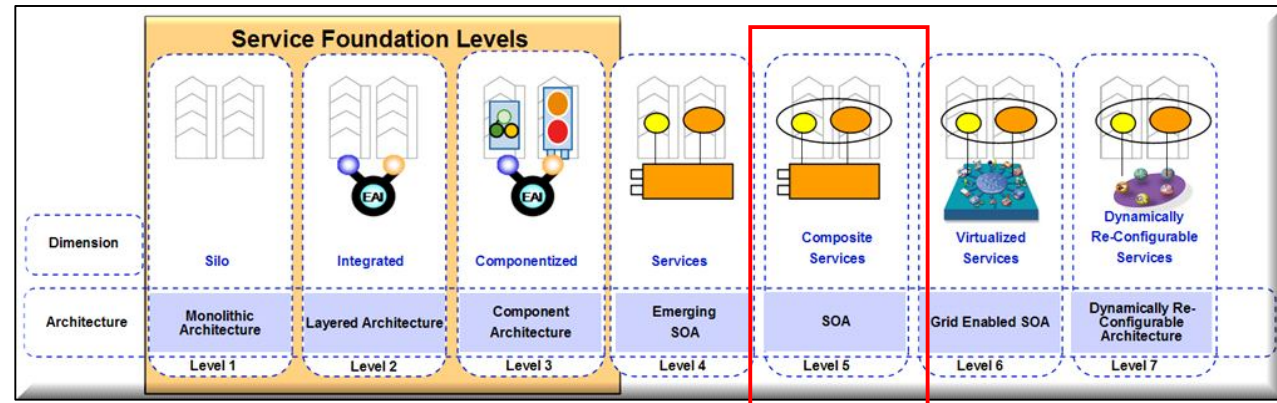
Evolving Attributes

- Use of Master Data Management is evolving
- Operational virtualization is evolving
- SOA Process Monitoring and Management provides insight into usage and service status
- Evolving integrated Identity Management and integrated Security Policy Management

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Agenda

- ❑ OSIMM Overview
- ❑ DDB Case Study
- ❑ DDB OSIMM Assessment
- ❑ Discussion
- ❑ Conclusions

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Summary of The DDB Group

History

- Formed in 1882
- Success due to:
- Quality of products
- Patented Processes
- Global growth by acquisit... similar companies
- Semi-autonomous operatio...

...ss Challenge

- ...ner
- ...ding
- ...e overhead
- ...roduction processes
- ...t production processes

- •DDB must participate in manufacturing global value chain partnerships:
  - Stay competitive
  - Grow business in emerging markets
- •Embrace industry standards

Current Status

- Produces hi-tech drill bits, cutters, routers, grinders and millers
- Customers are manufactures, users and spares wholesalers
- Preferred supplier to major machine tool manufacturers
- Products only manufactured against verified orders
- Rationalized order and production management
- Rationalized financial control

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DDB Group (Migration step 1)

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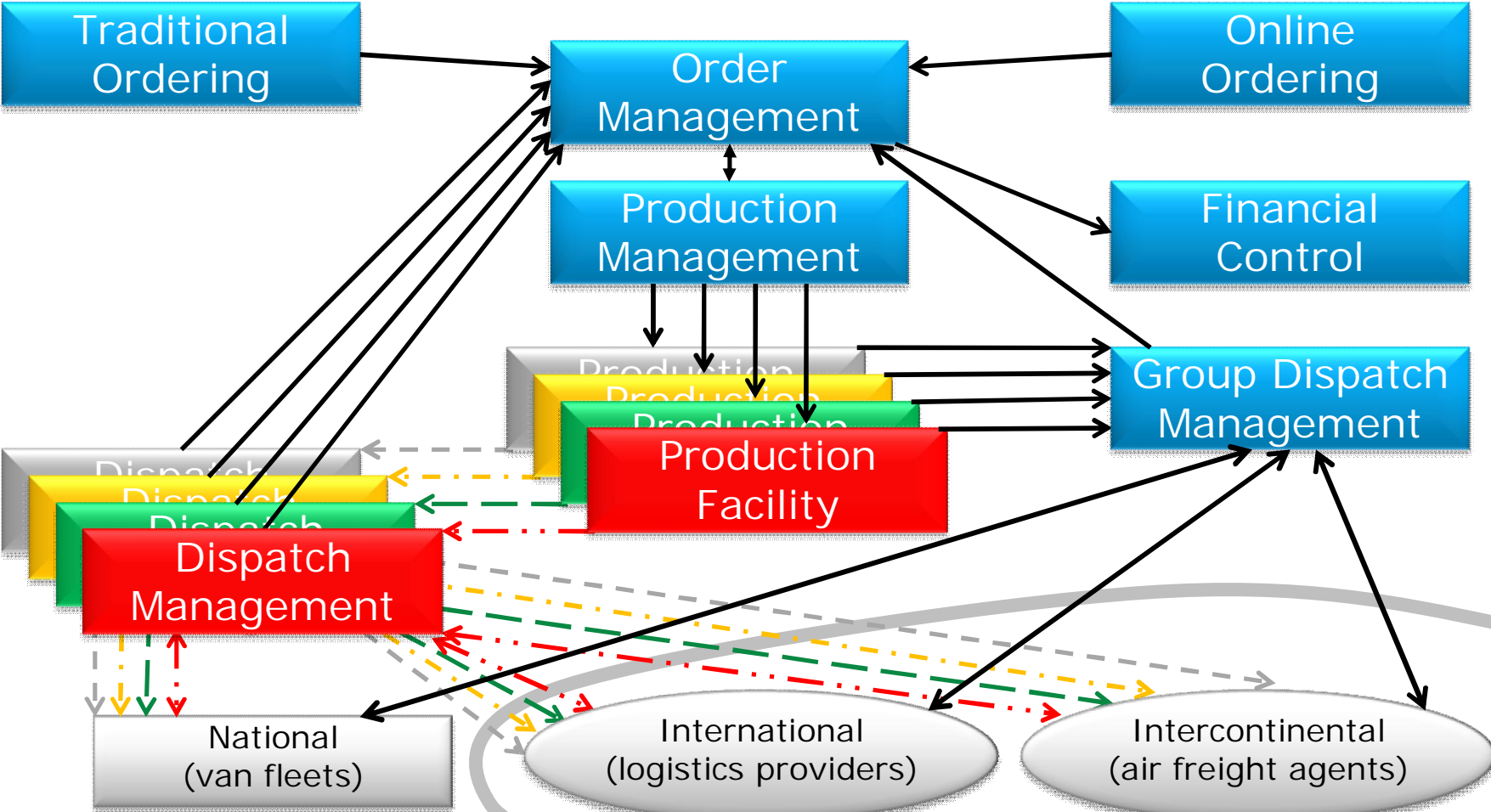
MIMOSA & OSA-EAI

MIMOSA support is required for:
- Manufacturing Process
- Supply Chain Processes
    - Order fulfillment
    - Customer Support
- New Product Development

Integrates Real-Time Control and Business Information Systems for the Enterprise which are critically dependent on assets

The **Open System Architecture for Enterprise Application Integration** (OSA-EAI) architecture is a specification published by the **Machinery Information Management Open Systems Alliance** (MIMOSA) organization. MIMOSA publishes XML-based specifications for Enterprise Application Integration (EAI) and Condition-based Maintenance (CBM), including detailed models for assets and equipment.

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MESA – Manufacturing Industry SOA Reference Architecture

Reference Implementation of SOA based manufacturing architecture using MMOSA and other manufacturing standards – based on early IBM SOA RA Models.

MESA SOA RA paper by Capgemini and IBM

Manufacturing Process Integration Architecture

Device to Plant Floor to Enterprise
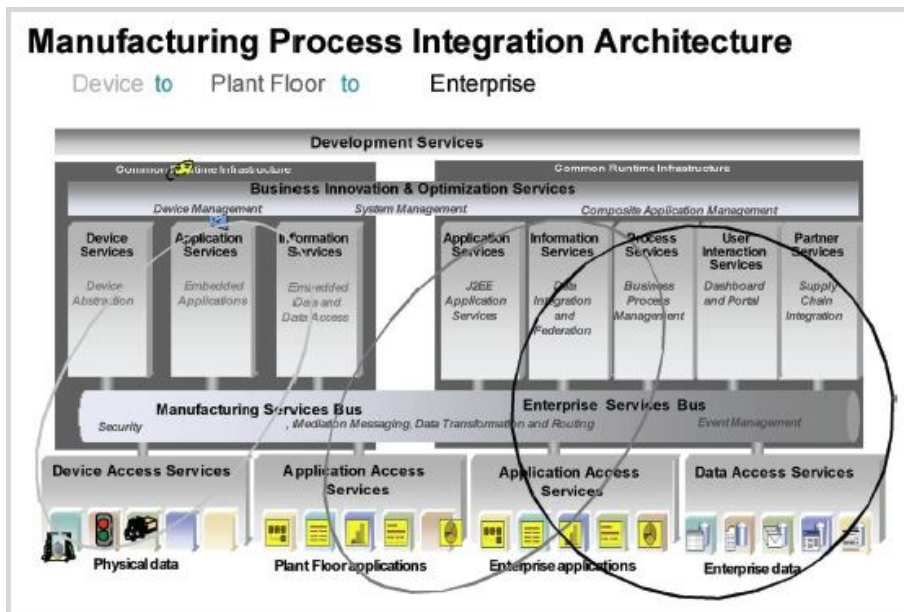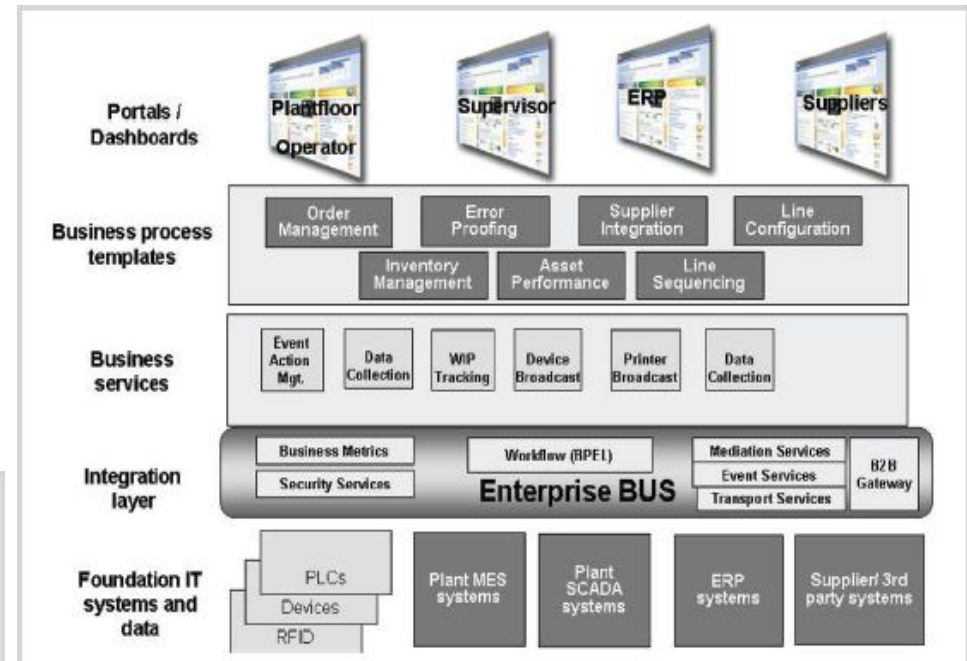
Logical Architecture

MESA SOA RA paper by Capgemini and IBM

ftp://ftp.software.ibm.com/software/applications/plm/resources/MESA_SOAinManufacturingGuidebook.pdf

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DDB SOA Strategic Direction

❑ Group Dispatch Management Solution

❑ Business processes, services, and infrastructure that will make up that solution

❑ The infrastructure should form a SOA platform that could also support services for other solutions, such as order management and production management

❑ Industry moving to support Open Industry Standards

❑ MIMOSA support is necessary to realize business objectives – industry interoperability

❑ Follow MESA Industry Reference Architecture Model as best practice

❑ Must support integration into the manufacturing tooling global value chain

- MESA provided DDB with a SOA based architectural vision
- MESA provides a basis for helping to measure LOB SOA Maturity using OSIMM

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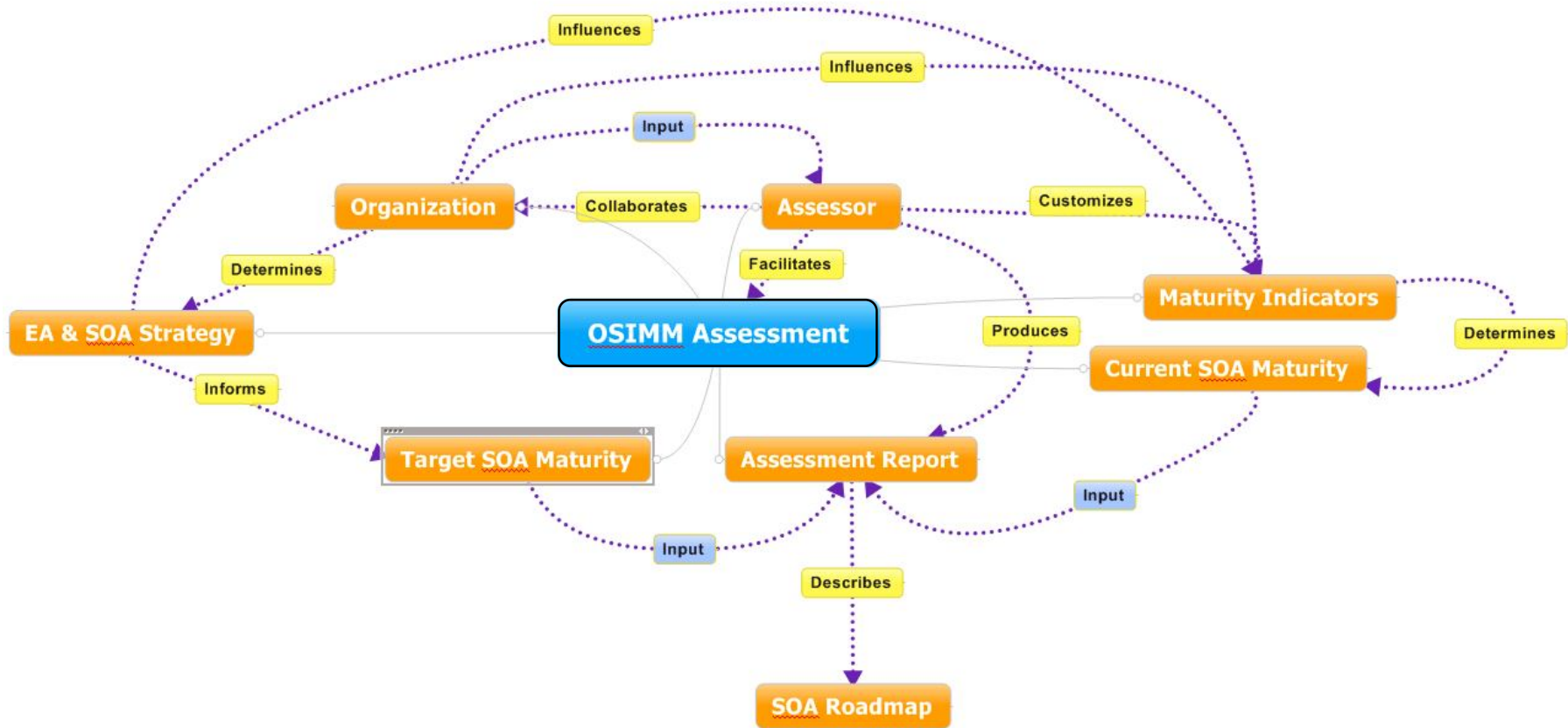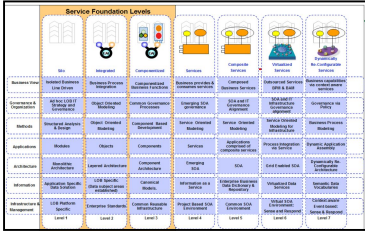*Making standards work*®

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OSIMM Assessment MindMap

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Maturity Indicators and Attributes

A SOA maturity assessment of the OSIMM Business Dimension is conducted by identifying the *formal definition and documentation of the organization's business drivers and processes.*

Maturity Indicators for the Business Dimension

Maturity Level Cell Name	Maturity Indicator	Maturity Attributes	Maturity Weighting	Assessment Question Mapping
Componentized (Level 3) *Componentized Business*	Formal definition and documentation of the organization's business drivers and processes.	**Cross-organizational** Some formal Enterprise Architecture constructs exists	30	15, 16
		Organizations business drivers are documented as cross organizational business objectives.		1, 2, 9, 17, 18, 19
Services (Level 4) *Componentized Business Provides and Consumes Services*	Formal definition and documentation of the organization's business drivers and processes.	**Enterprise-wide** Formal use of Enterprise Architecture	40	3, 15, 16
		Organizations business drivers are documented as elements of the Enterprise Mission and Business Architecture		1, 2, 3, 8, 9, 10, 11, 17, 18, 19
	Formal definition and	**Integrated Enterprise-**		

Maturity Indicator:

- A Service capability of the business or IT organization.

- Associated with a specific service maturity dimension at a specific level of maturity.

- Focus of the assessment

Maturity Attribute:

- An observed characteristic of a maturity indicator.

- Maturity attributes are **observed** capabilities of the target assessment organization.

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Assessment Questions

3.2 Business Dimension - Assessment Questions

The following assessment questions help elicit information on how an organization formally defines and documents their business drivers and processes. By gathering information using these assessment questions an assessor can map a maturity indicator to the associated maturity attributes thereby determining the business dimension maturity level.

1. What are the major business drivers for this initiative?

2. What is the business vision and goals and how are these related to what IT is currently doing?

3. Is your current Business Process Architecture formally defined, documented and governed?

4. Is your Business Process Architecture complete & up to date?

5. How are metrics for return on investment measured in Business Process Management?

6. How agile are your current business processes?

Maturity Indicators for the Business Dimension				
Maturity Level *Cell Name*	**Maturity Indicator**	**Maturity Attributes**	**Maturity Weighting**	**Assessment Question Mapping**
Siloed (Level 1) *Isolated Business Line Driven*	Formal definition and documentation of the organization's business drivers and processes.	**Low or Nonexistent** Business Processes are not formally defined and documented. Limited to how specific applications must behave, IT specific	10	2, 3

Assessment Questions

- Questions that are used to gather information about an organizations service practices.

- Used to map to maturity attributes for each maturity indicator.

- Results in a maturity scoring

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Assessment Questions – Method Dimension

5.2 Method Dimension - Assessment Questions

By gathering information using these assessment questions an assessor can map a maturity indicator to the associated maturity attributes thereby determining the Method dimension maturity level.

1. What are the current application or systems requirements elicitations and requirements management practices?
2. What design methodologies and best practices are you currently adopting?
3. Do you practice any SOA design techniques?
4. What design tools are in practice today?
5. What is the current practice for service development and management?
6. What is your current project management framework?
7. How is IT project management organized?
8. What are your organization's current QA processes?
9. Do you have an active community that works to evolve your SOA methods
10. Has your organization developed a repository for best practices and asset r...

Maturity Indicators for the Method Dimension

Maturity Level Cell Name	Maturity Indicator	Maturity Attributes	Maturity Weighting	Assessment Question Mapping
Composite Services (Level 5) Service Oriented Modeling	Formal use of an SOA architectural design, construction and deployment methodology for the implementation of services.	**Integrated Enterprise-wide** A formal and recognized methodology for the creation, development, deployment and management is in practice. A recognized community is empowered to manage, train and update the enterprise SOA methods and practices.	50	1, 2, 3, 5 7, 9
Virtualized Services (Level 6) Service Oriented Modeling for Infrastructure	Formal use of an SOA architectural design, construction and deployment methodology for the implementation of services.	**Integrated across the Enterprise and externally between business partners** Formal methods are used to create and manage both internal and external (partner) based services. Best practice guidance has been developed to facilitate consistent adoption of SOA and virtualization	60	1, 2, 3 4, 9, 10

Observed Attributes

Loading the OSIMM Framework

❑ Important to customize the OSIMM framework to reflect overall services strategy

❑ Add Maturity Indicators to focus on
  ▪ Alignment of EA Vision
  ▪ Industry Standards
    ▪ **MIMOSA and MESA use**
  ▪ Internal Enterprise Standards / Techniques
  ▪ SOA Standards
  ▪ Enabling service location transparency (enables outsourcing)

❑ Assessment questions are intended to identify the SOA Maturity Attributes of the assessed organization.

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Business Dimension

Extending the model with additional maturity indicators

❑ Business Dimension base model maturity indicator:

- *A SOA maturity assessment of the OSIMM Business Dimension is conducted by* **identifying the formal definition and documentation of the organization's business drivers and processes.**

❑ Base model can be extended by adding:

- **Standards:** Indentify the formal business process definition for implementing MIMOSA business flows
- **Standards:** Identify the business plan for integrating with the overall tooling manufacturing global value chain
- **Outsourcing:** Increasing service maturity to facilitate service location transparency

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Business Dimension
Maturity Level to Indicator / Attribute Mapping

Maturity Indicators for the Business Dimension				
Maturity Level *Cell Name*	**Maturity Indicator**	**Maturity Attributes**	**Maturity Weighting**	**Assessment Question Mapping**
Siloed (Level 1) *Isolated Business Line Driven*	Indentify the formal business process definition for implementing MIMOSA business Flows.	**Low or Nonexistent** No formal understanding of MIMOSA / MESA. No strategic plan for implementing MIMOSA / MESA vision. No formal business flows identified or documented. Enterprise Architecture is not an element of the IT or Enterprise strategy.	10	2, 15 3 1, 9, 17, 18
Integrated (Level 2) *Business Process Integration*	Formal business process definition for implementing MIMOSA business Flows.	**Limited** Limited understanding of MIMOSA / MESA. Limited strategic planning for implementing MIMOSA / MESA vision. No formal business flows identified or documented.	20	15 1, 2, 3, 4, 6, 9, 17, 18, 19
Componentized (Level 3) *Componentized Business*	Formal business process definition for implementing MIMOSA business Flows.	**Cross-organizational** Organizational acceptance of MIMOSA/MESA vision. Strategic planning is in the process of being conducted. Business components are not integrated into value chain. .	30	15, 16 1, 2, 9, 17, 18, 19

Maturity Indicators for the Business Dimension				
Maturity Level *Cell Name*	**Maturity Indicator**	**Maturity Attributes**	**Maturity Weighting**	**Assessment Question Mapping**
Services (Level 4) *Componentized Business Provides and Consumes Services*	Formal business process definition for implementing MIMOSA business Flows.	**Enterprise-wide** Formal acceptance of MIMOSA/MESA based Enterprise Architecture. Business flows are defined using manufacturing industry standards process. Formal use of Enterprise Architecture	40	3, 15, 16 1, 2, 3, 8, 9, 10, 11, 17, 18, 19
Composite Services (Level 5) *Processes Provided and Consumed via Composite Business Services*	Formal business process definition for implementing MIMOSA business Flows.	**Integrated Enterprise-wide** MIMOSA / MESA EA is defined in terms of BPM flows. Organizations business drivers are as elements of the overall global business value chain.	50	3, 4, 5, 6, 10, 11, 15, 16 1, 2, 3, 8, 9, 10, 11, 17, 18, 19
Virtualized Services (Level 6) *Outsourced services, BPM and BAM*	Formal business process definition for implementing MIMOSA business Flows.	**Integrated across the Enterprise and externally between business partners** Well defined Enterprise Architecture that details both internal process flows as well as outsourced processes with and between business partner services in terms of MIMOSA business flows and MESA best practices. Strong use of Business Activity Monitoring (BAM).	60	4, 5 ,6, 7, 9, 11, 12, 13, 14, 15, 19

Architecture Dimension

Extending the model with additional maturity indicators
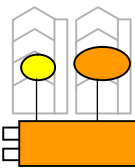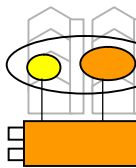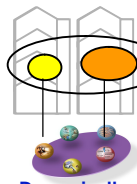
- Architecture Dimension base model maturity indicator:
    - A SOA maturity assessment of the OSIMM Architecture Dimension can be conducted by *identifying those service components that have been designed and are deployed using formal SOA methods, principles, patterns, frameworks or techniques.*

- Base model can be extended by adding:
    - **Standards: Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.**
    - **Outsourcing: Service components are designed to allow substitution of outsourced services**
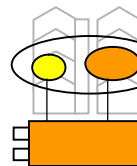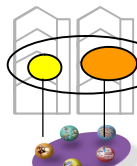
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Architecture Dimension
Maturity Level to Indicator / Attribute Mapping

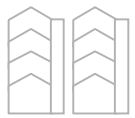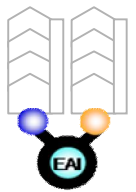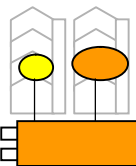| Maturity Indicators for the Architecture Dimension				
Maturity Level Cell Name	Maturity Indicator	Maturity Attributes	Maturity Weighting	Assessment Question Mapping
Siloed (Level 1) *Monolithic Architecture*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Low or Nonexistent** No SOA methods or practices are apparent.	10	1, 7
Integrated (Level 2) *Layered Architecture*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Limited** Limited use of formal SOA methods and practices can be observed. No recognition or use of MESA SOA models or best practices. MIMOSA implementations are limited to integration between applications or systems using point to point EAI.	20	1, 2, 5, 6, 7 4, 8, 9
Componentized (Level 3) *Component Architecture*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Cross-Organizational** Formal SOA methods and practices are employed but most implementations have not implemented MESA industry models. MIMOSA may be limited or only used for interoperability. Utilization of MESA RF and MIMOSA standards are inconsistently applied.	30	4, 5, 6, 7, 8 9, 10, 11

Maturity Indicators for the Architecture Dimension				
Maturity Level Cell Name	Maturity Indicator	Maturity Attributes	Maturity Weighting	Assessment Question Mapping
Services (Level 4) *Emerging SOA*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Enterprise-wide** Formal SOA methods and practices are employed and many implementations have implemented elements of the MESA industry models. MIMOSA standards are not fully service enabled.	40	4, 5, 6, 1, 7, 8, 11
Composite Services (Level 5) *SOA*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Integrated Enterprise-wide** Most systems are using MESA SOA RF based implementations that have implemented MIMOSA standards for internal interoperability.	50	7, 8, 9, 11 2, 10
Virtualized Services (Level 6) *Grid Enabled SOA*	Service components are designed using MESA industry best practices and industry SOA reference architecture models that implement the MIMOSA standards.	**Integrated across the Enterprise and externally between business partners** All systems are using MESA SOA RF based implementations that have implemented MIMOSA standards for internal and business partner interoperability. Many business processes have been integrated into the global value chain.	60	1, 3, 4, 5, 6, 9 2, 8, 10, 11

DDB SOA Maturity Vision

	Silo	**Integrated**	**Componentized**	**Services**	**Composite Services**	**Virtualized Services**	**Dynamically Re-Configurable Services**
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Information	Application Specific Data Solution	LOB Specific (Data subject areas established)	Canonical Models.	Information as a Service	Enterprise Business Data Dictionary & Repository	Virtualized Data Services	Semantic Data Vocabularies
Infrastructure & Management	LOB Platform Specific	Enterprise Standards	Common Reusable Infrastructure	Project Based SOA Environment	Common SOA Environment	Virtual SOA Environment: Sense and Respond	Context-aware Event-based: Sense & Respond
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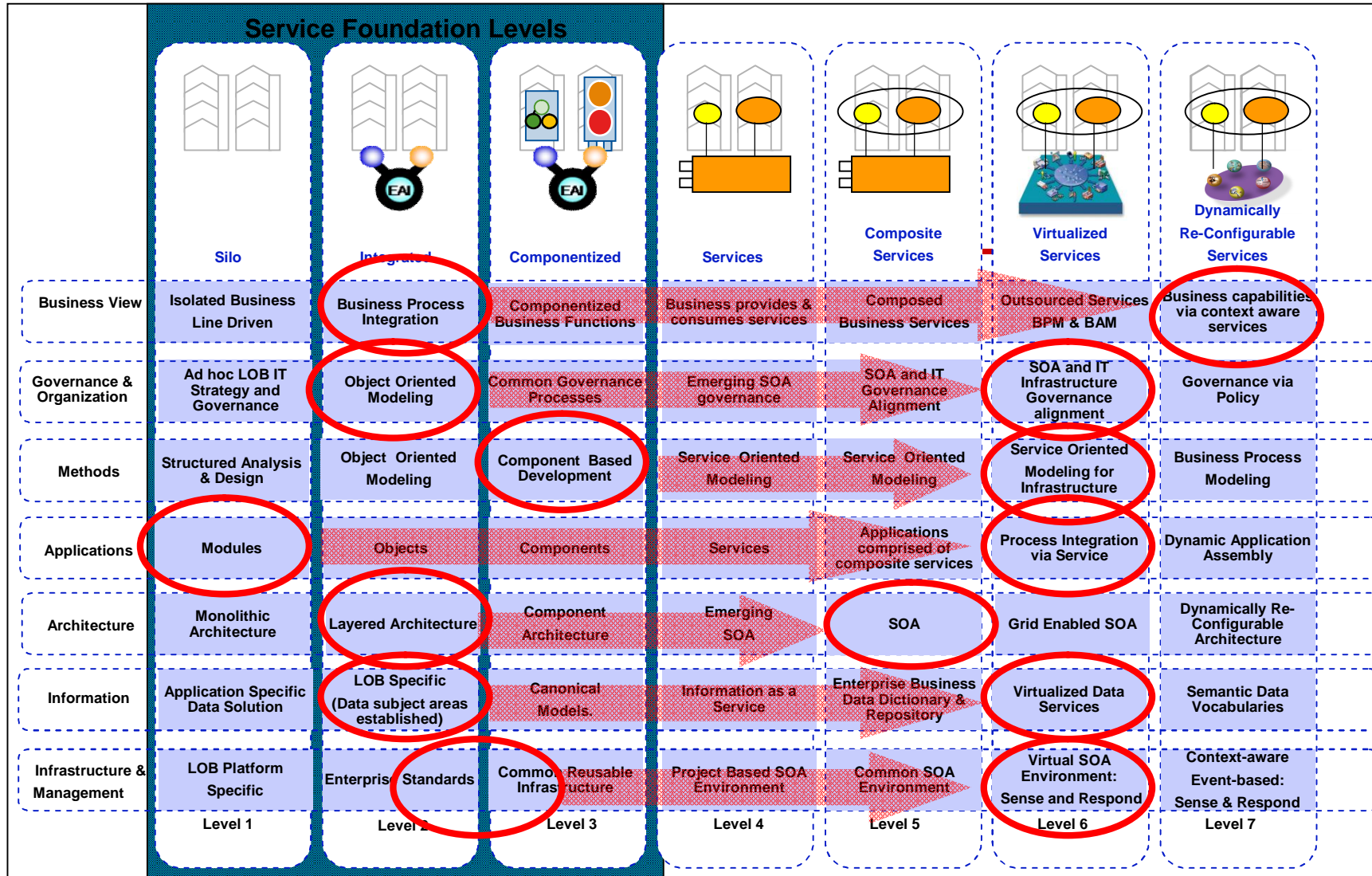**Service Foundation Levels**

DDB OSIMM Assessment Results

Service Foundation Levels

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DDB SOA Maturity Roadmap

Service Foundation Levels

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- Conclusions

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Conclusions

❑ Important to customize the OSIMM framework to reflect overall services strategy

❑ Customize OSIMM to focus on:

 ▪ Industry Standards

 ▪ Internal Enterprise Standards / Techniques
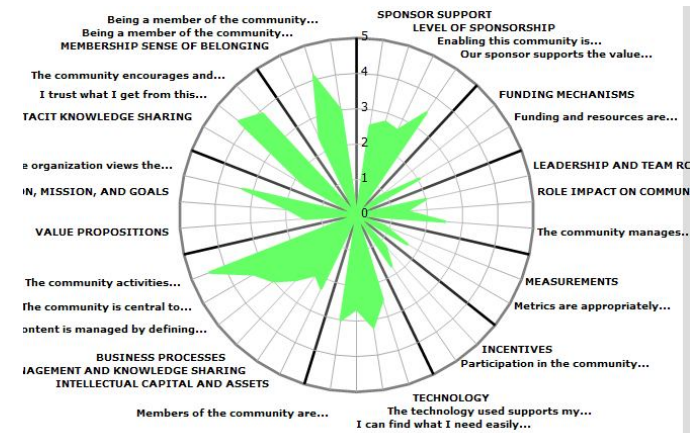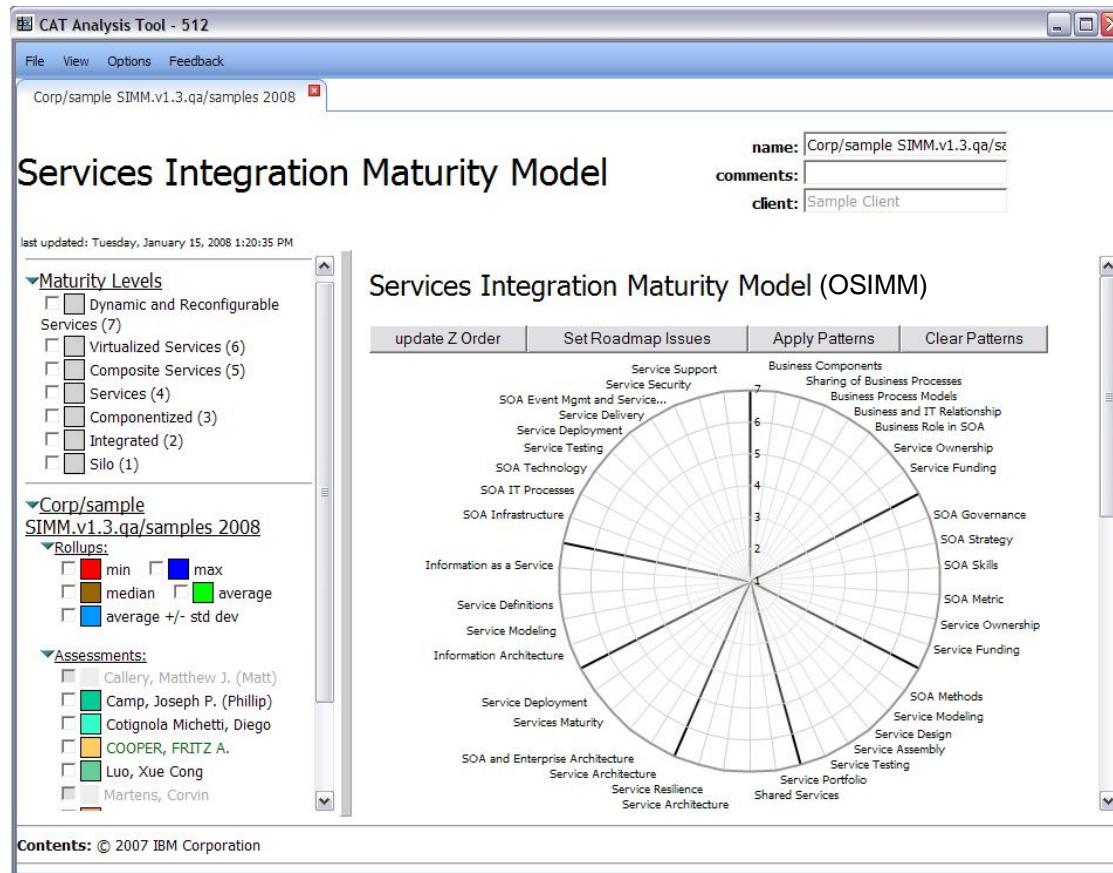
 ▪ SOA Standards

 ▪ Alignment of EA Vision

❑ OSIMM assessments can be used to help refine an organizations services strategy and approach

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Questions please

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Backup Slides

IBM OSIMM Tooling Support

OSIMM Support
within the
IBM SOA Assessment
and Roadmap
(ART) Tool

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Overview of the SOA Reference Architecture

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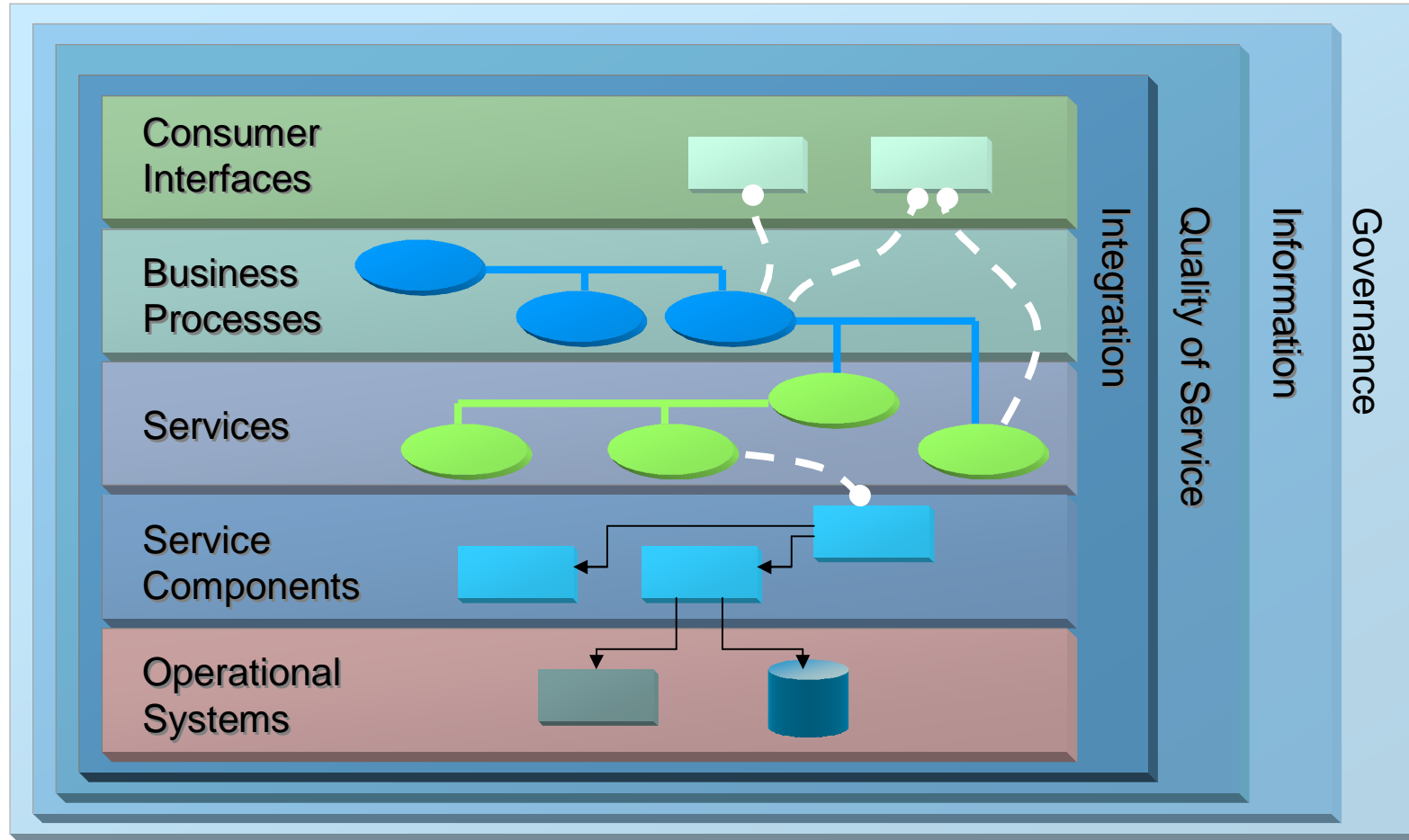
Architectural Building Blocks for Services Layer

#	Capability Category	ABB Name	Supported Capabilities
1.1	**Service Definition**	Service	1
		Governance Layer: Service Repository	1
1.2	**Service Runtime Enablement**	Service Container	2 - 5
1.3		Service Interaction Manager	6
		Governance Layer: Service Registry	3
		QoS Layer: Status Manager	7
1.4	**Policy Management**	Governance Layer: Policy Manager	8 - 9
1.5		QoS Layer: Policy Enforcer	10 - 11
1.6	**Access Control**	QoS Layer: Access Controller	12 - 13
1.8	**Service Clustering**	Cluster Manager	14 - 15

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Service Invocation Components and Flow
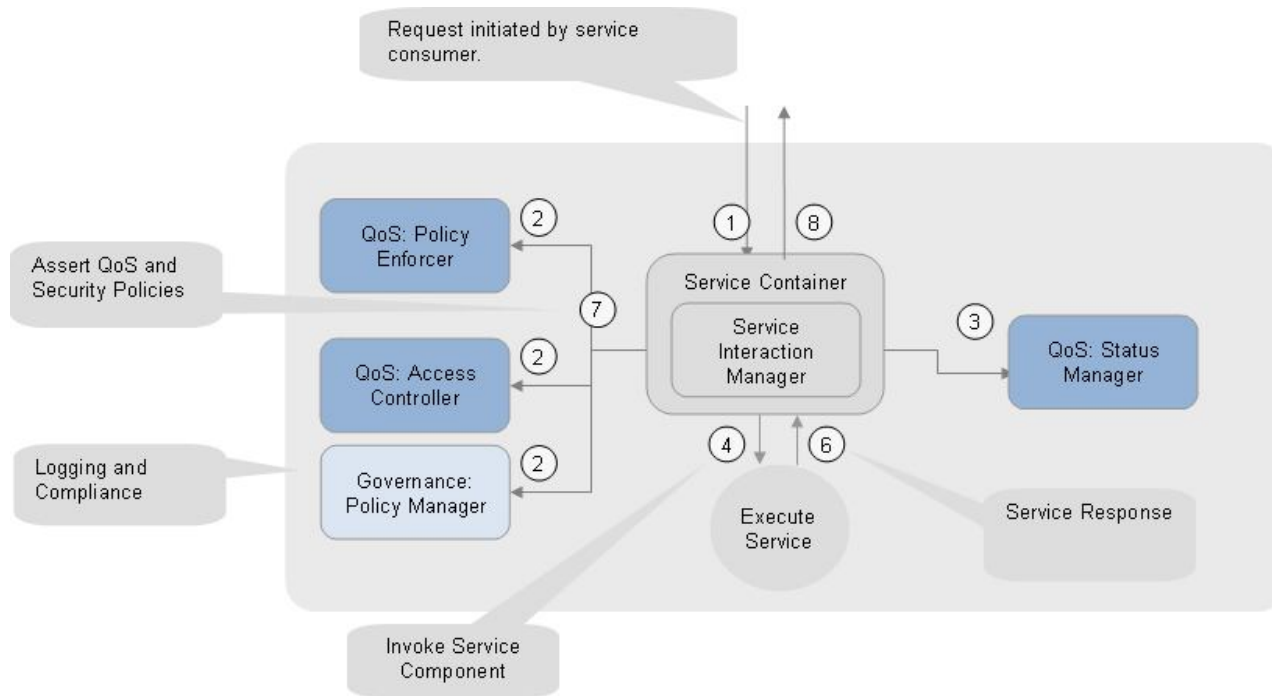

SOA Reference Architecture will allow us to ensure that essential elements of SOA are part of our OSIMM Assessment

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Standards

|			
ISO 15926			integration of data to support the lifecycle activities and processes for production facilities
ISA 88			enables batch process industries to produce with configurable recipe with selectable chain of equipment
ISA 95			integration of enterprise and control systems
MIMOSA	Machinery Information Management Open Systems Alliance		practical interoperability of on-board and ground condition monitoring and health assessment systems with enterprise-level maintenance, reliability, and operational logistics applications.
OpenO&M	Open Operations and Management		provide a harmonized set of standards for the exchange of Operations & Maintenance (O&M) data and associated context
POSC Caesar	Petrotechnical Open Software Corporation/CAESAR Offshore Project		development of open specifications to be used as standards for enabling the interoperability of data, software and related matters to reduce life cycle costs and development time of oil and gas facilities
OPC	Open Process Control		defines a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate interoperability
Energistics WITSML	Wellsite Information Transfer Standard ML		seamless flow of well data between operators and service companies to speed and enhance decision making
Energistics PRODML	Production ML		low cost, low risk, and highly innovative environment for the configuration and running of advanced optimization processes
W3C Semantic Web (RDF)	Resource Description Framework		language for representing information about resources in the World Wide Web
W3C Semantic Web (OWL)	Web Ontology Language		represent the meaning of terms in vocabularies and the relationships between those terms
W3C Semantic Web (SPARQL)	SPARQL Protocol and RDF Query Language		RDF query language

Assessment Process
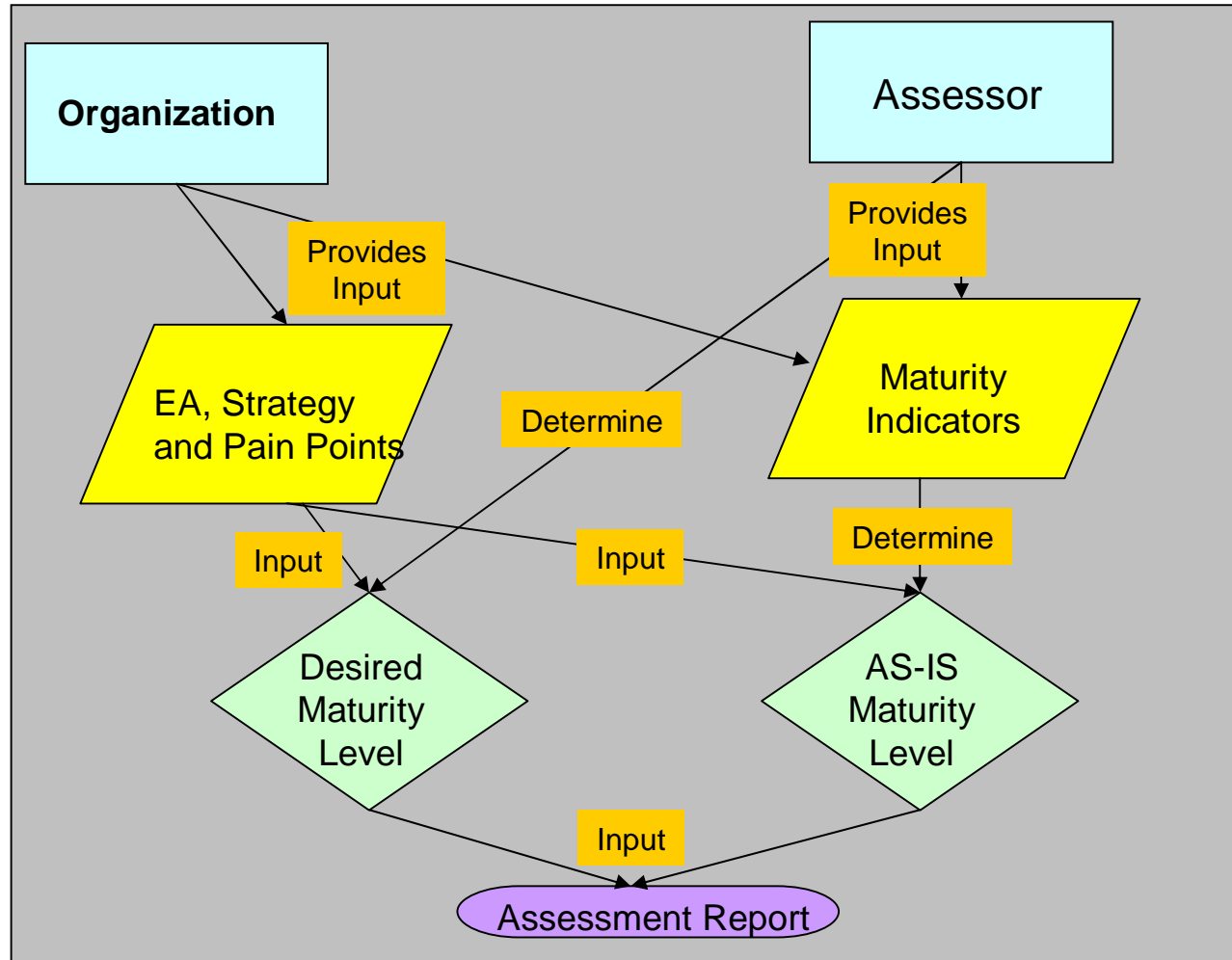
TOGAF and Zachman
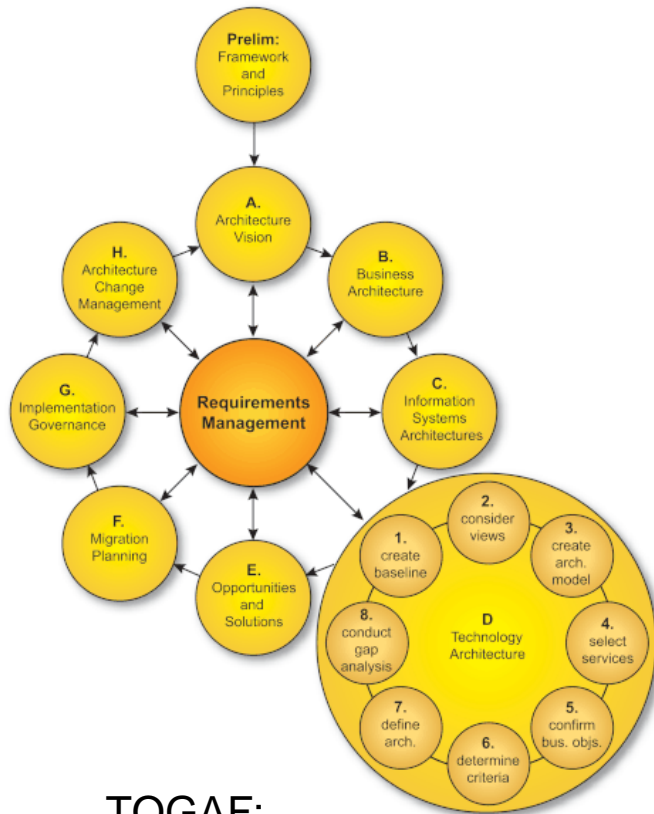
TOGAF:

- EA Life-cycle Process
- Service Taxonomy
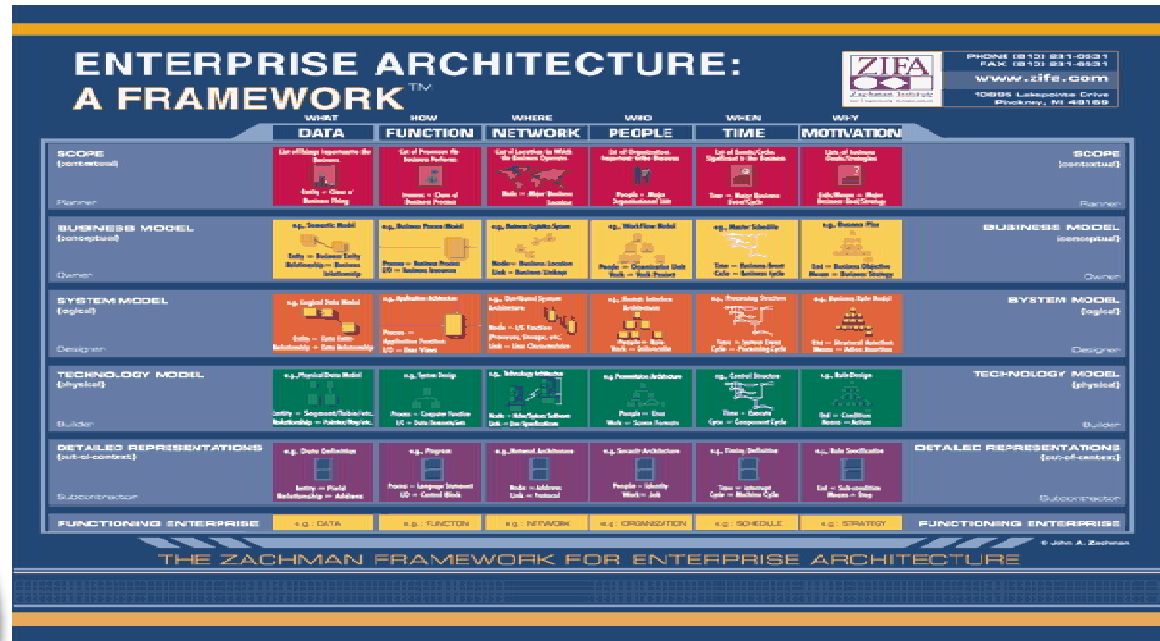
Zachman:

- EA Model Perspectives
- EA Taxonomy

"ADM and the Zachman Framework" (http://www.opengroup.org/architecture/togaf8-doc/arch/chap39.html) provides a mapping of the TOGAF Architecture Development Method (ADM) to the Zachman Framework.

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