

The CSVLOD Model of Enterprise Architecture and Its Value for the EA Discipline

Svyatoslav Kotusev

Enterprise Architecture Researcher

(kotusev@kotusev.com)

Visit <http://kotusev.com>

What Is Enterprise Architecture?

What components constitute enterprise architecture?

Two conceptualizations of enterprise architecture currently dominate in the EA discourse:

- Enterprise architecture as business architecture, data architecture, application architecture and technology architecture
- Enterprise architecture as the current state, future state and transition roadmap

EA as Four Architectures

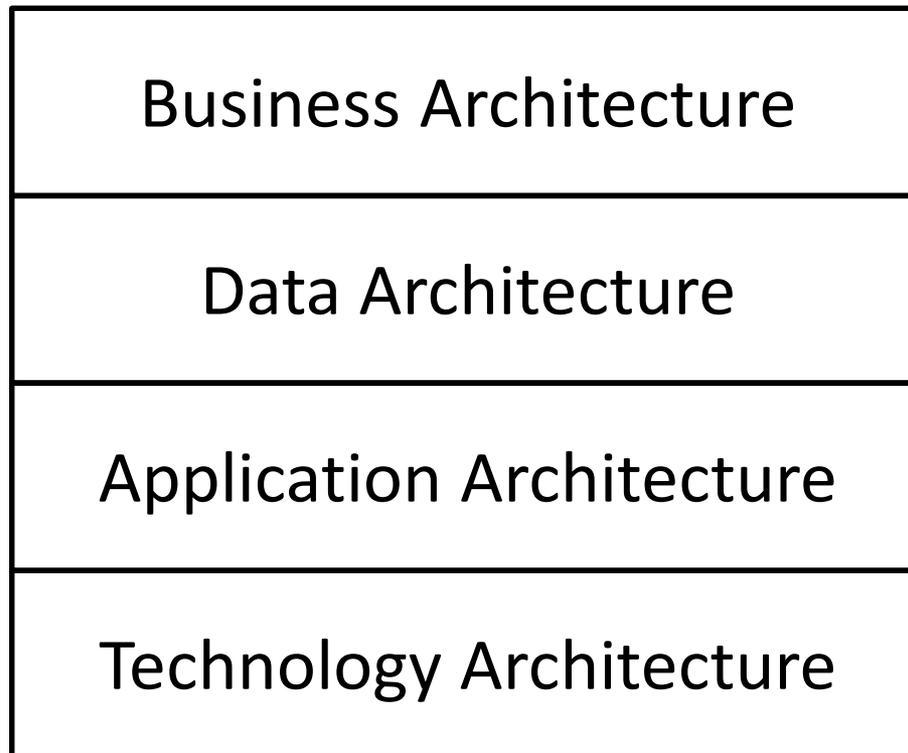
Enterprise architecture consists of four components:

- Business (or organization) architecture
- Data (or information) architecture
- Application (or system) architecture
- Technology (or infrastructure) architecture

Four “layers” of enterprise architecture, or BDAT stack

EA as Four Architectures

Enterprise Architecture



Associated Problems

Problems with understanding enterprise architecture as four separate architectures:

- No clear-cut architectures, e.g. EA artifacts can describe many layers simultaneously
- Low explanatory power, e.g. what are the usage scenarios or stakeholders of data architecture?
- Largely self-serving, e.g. same as classifying EA artifacts into black-and-white and colored
- Other domains can be also described in EA artifacts

Overall Adequacy

Thinking about enterprise architecture as four separate architectures is inadequate

Thinking about enterprise architecture in this way resembles thinking about cars as a mix of metal, plastic, glass and rubber, i.e. true but useless

EA as Two States and Roadmap

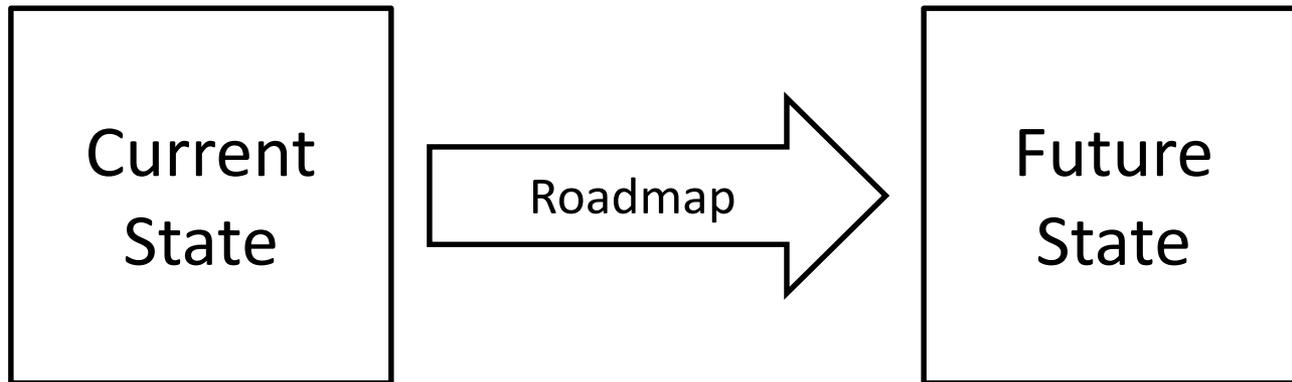
Enterprise architecture consists of three components:

- Current (baseline, as-is, existing, etc.) state
- Future (target, to-be, desired, etc.) state
- Roadmap (or transition plan)

Two states, gap analysis, getting from “here” to “there”

EA as Two States and Roadmap

Enterprise Architecture



Associated Problems

Problems with understanding enterprise architecture as the current state, future state and roadmap:

- In most cases the long-term future state for the whole enterprise is not (and even cannot be) defined
- There may be many future states for different scopes (business department, change program, etc.) and planning horizons (e.g. 1, 2, 3 and 5 years)
- Simplistic model, does not reflect full complexity
- Organizations cannot be engineered mechanistically

Overall Adequacy

Thinking about enterprise architecture as the current state, future state and roadmap is inadequate

Thinking about enterprise architecture in this way is a misleading simplification of the organizational reality

Current Situation with EA

Current situation in the EA discipline:

- Both popular conceptualizations of enterprise architecture are inadequate
- No alternative evidence-based conceptualizations exists
- It is not clear what components constitute enterprise architecture
- For many years the phenomenon of enterprise architecture has no meaningful explanation

Introducing the CSVLOD Model

The CSVLOD model is a novel conceptualization of enterprise architecture from scratch that:

- Emerged from research, not from marketing
- Supported by evidence from real organizations
- Reflects genuine industry EA best practices
- Accurately describes empirical realities of EA
- Fills the critical gap in the EA discipline

CSVLOD Taxonomy for Artifacts

	Rules	Structures	Changes
Business-Focused	<p>Considerations</p> <p>Global conceptual rules and fundamental considerations important for business and relevant for IT</p>	<p>Visions</p> <p>High-level conceptual descriptions of an organization from the business perspective</p>	<p>Outlines</p> <p>High-level descriptions of separate IT initiatives understandable to business leaders</p>
IT-Focused	<p>Standards</p> <p>Global technical rules, standards, patterns and best practices relevant for IT systems</p>	<p>Landscapes</p> <p>High-level technical descriptions of the organizational IT landscape</p>	<p>Designs</p> <p>Detailed technical and functional descriptions of separate IT projects actionable for project teams</p>

Considerations EA Artifacts

Considerations are Business-Focused Rules

Principles

<p>Principle 1: Standardized Business Processes</p> <p>Statement:</p> <p>Rationale:</p> <p>Implications:</p>
<p>Principle 2: Single Customer View</p> <p>Statement:</p> <p>Rationale:</p> <p>Implications:</p>
<p>Principle 3: Business Continuity</p> <p>Statement:</p> <p>Rationale:</p> <p>Implications:</p>

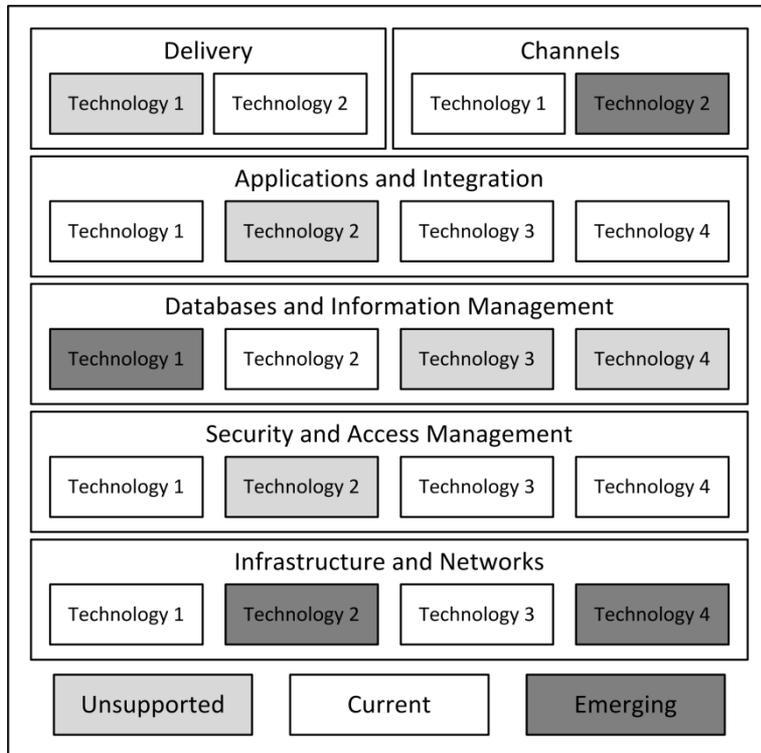
Policies

External	National Privacy Policies	Policy 1: Personal Data Must Be Stored Onshore Description:
		Policy 2: Destroy Personal Data When Not Needed Description:
	Sarbanes-Oxley Policies	Policy 3: Log All Accesses to Accounting Systems Description:
		Policy 4: Retain Audit Trails and Emails for 5 Years Description:
Internal	Data Security Policies	Policy 5: No Sensitive Data on Mobile Devices Description:
		Policy 6: Store Credit Cards in Encrypted Formats Description:
	Data Exchange Policies	Policy 7: Do Not Share Key Data with Third Parties Description:
		Policy 8: Share Client Data with Trusted Partners Description:
	Cloud Hosting Policies	Policy 9: Use Only the PCI DSS Compliant Cloud Description:
		Policy 10: Do Not Store Health Data in the Cloud Description:

Standards EA Artifacts

Standards are IT-Focused Rules

Technology Reference Models



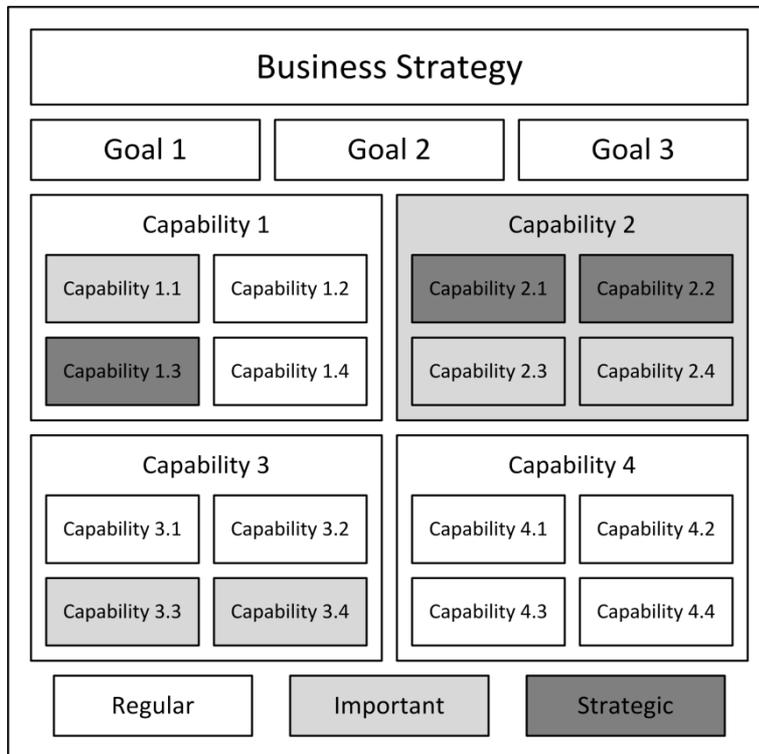
Guidelines

Server Deployment Standards	Guideline 1: Run Applications as OS Services Description:
	Guideline 2: Store Deployment Packages in VCS Description:
Network Protocol Standards	Guideline 3: Avoid Using UDP Multicast Description:
	Guideline 4: Prefer REST Over SOAP Description:
Data Encryption Standards	Guideline 5: Use 256-Bit Encryption Keys Description:
	Guideline 6: Store MD5 Hashes of Passwords Description:
Interface Design Guidelines	Guideline 7: Use Web-Safe Colours Description:
	Guideline 8: Place Menu in the Top Right Corner Description:
Secure Coding Guidelines	Guideline 9: Initialize Variables to Safe Defaults Description:
	Guideline 10: Validate All Incoming Data Description:

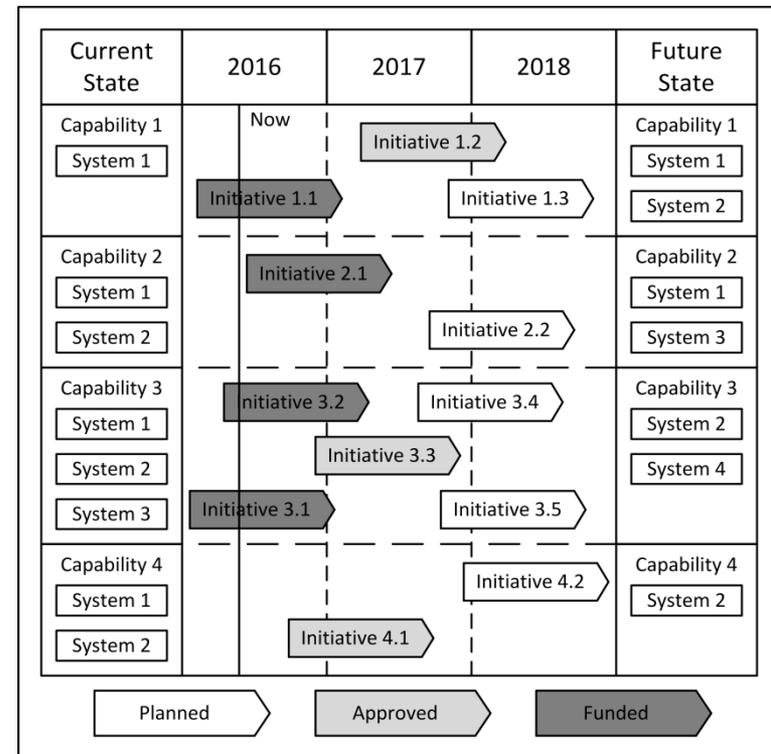
Visions EA Artifacts

Visions are Business-Focused Structures

Business Capability Models



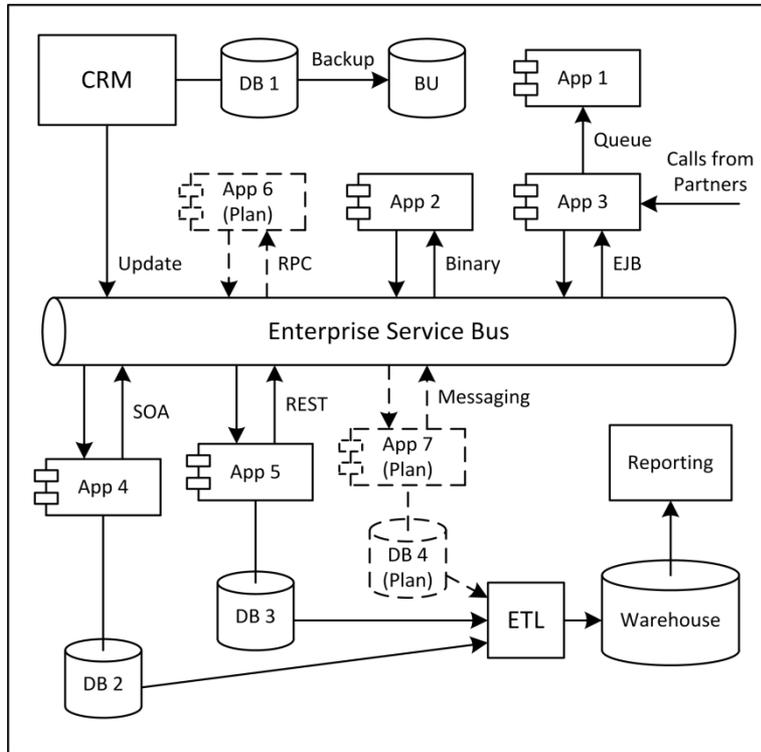
Roadmaps



Landscapes EA Artifacts

Landscapes are IT-Focused Structures

Landscape Diagrams



Inventories

Asset	Purpose	Owners	Cost	Problems
Application 1
Application 2
Application 3
Application 4
System 1
System 2
System 3
System 4
System 5
Database 1
Database 2
Database 3
Database 4

Decommission

Reuse

Invest

Outlines EA Artifacts

Outlines are Business-Focused Changes

Solution Overviews

<ol style="list-style-type: none"> 1. Overview and Goals 2. Scope and Stakeholders 3. Essential Requirements 4. Business Benefits 5. Capability Impact <ul style="list-style-type: none"> • Order Fulfilment (High) • Order Management (Low) • Customer Analytics (Low) 6. Involved Partners <ul style="list-style-type: none"> • IBM • Accenture 7. Estimations Time: 6-8 months Cost: \$1.2-1.5 million 	<p>8. Business Process Changes</p> <p>Process 1 Now (10 days in total):</p> <pre> graph LR S1((Step 1)) --> S2((Step 2)) S2 --> S3((Step 3)) S1 --- D1[3 days] S2 --- D2[5 days] S3 --- D3[2 days] </pre> <p>Process 1 Will Be (5 days in total):</p> <pre> graph LR S1((Step 1)) --> S2((Step 2)) S1 --- D1[2 days] S2 --- D2[3 days] </pre> <p>9. Architectural Overview</p> <pre> graph TD C1[Client 1] --> P1[Process 1] subgraph P1 [Process 1] S1((Step 1)) --> S2((Step 2)) end S1 --- A1[App 1] S2 --- A2[App 2] A1 --- DB1[(DB 1)] A2 --- DB2[(DB 2)] </pre> <p>10. Key Risks</p>
---	---

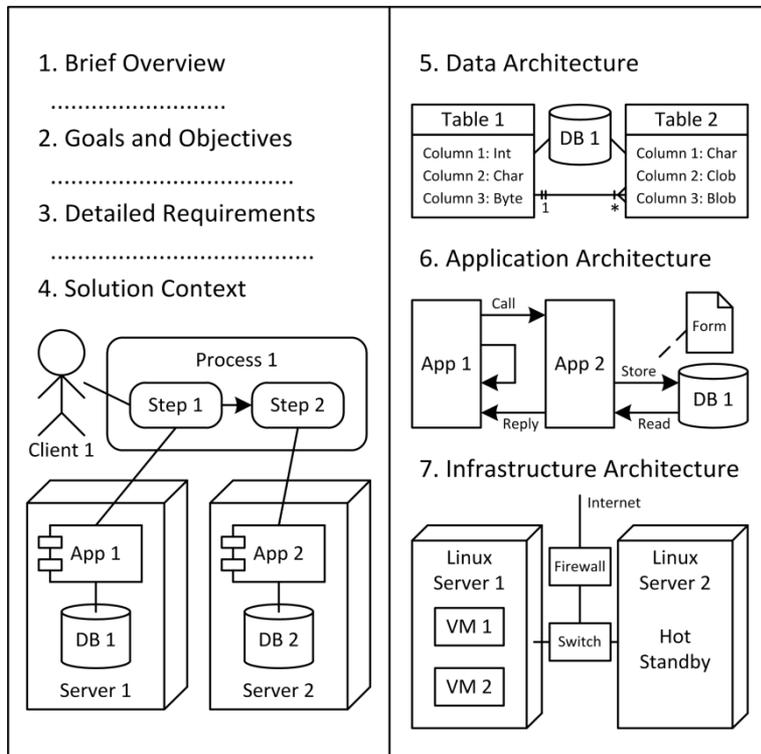
Options Assessments

Option	Score
<p>Solution 1:</p> <pre> graph LR U[Users] --> P[Process] P --> OS[Old System] P --> NS[New System] </pre> <p>Time: 8-13 months Cost: \$2.0-3.5 million Advantages: Disadvantages: Risks:</p>	<p>Functionality: 5 Feasibility: 2 Alignment: 4 Total Score: 11</p>
<p>Solution 2:</p> <pre> graph LR U[Users] --> P[Process] P --> OS[Old System] P --> ES[Extra System] </pre> <p>Time: 4-7 months Cost: \$1.0-1.7 million Advantages: Disadvantages: Risks:</p>	<p>Functionality: 3 Feasibility: 3 Alignment: 1 Total Score: 7</p>
<p>Solution 3:</p> <pre> graph LR U[Users] --> P[Process] P --> ES[Enhanced System] </pre> <p>Time: 3-5 months Cost: \$0.7-1.3 million Advantages: Disadvantages: Risks:</p>	<p>Functionality: 2 Feasibility: 5 Alignment: 2 Total Score: 9</p>

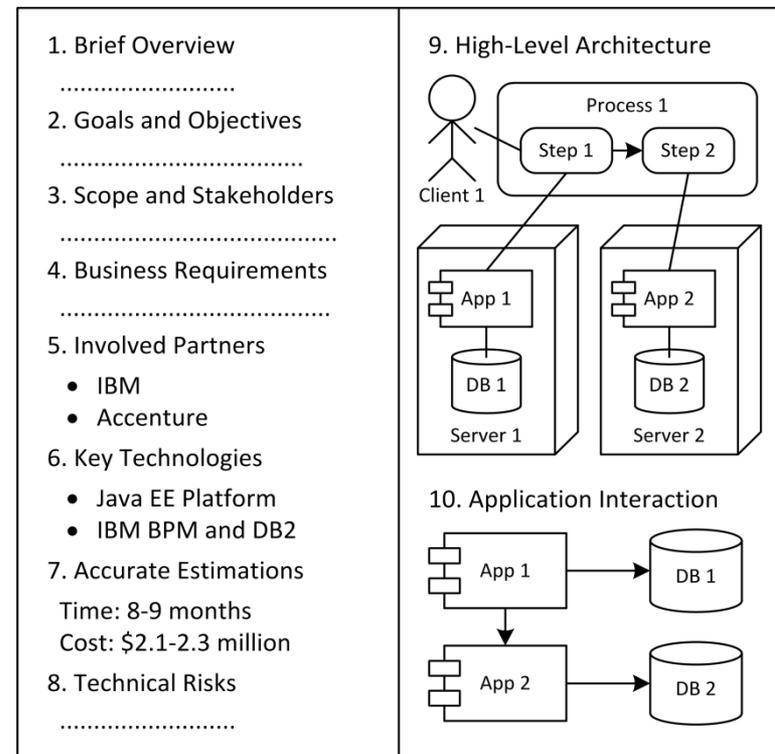
Designs EA Artifacts

Designs are IT-Focused Changes

Solution Designs



Preliminary Solution Designs



Usage of EA Artifacts

	Rules	Structures	Changes
Business-Focused	<p>Considerations</p> <p>Developed collaboratively by senior business leaders and architects and then used to influence all architectural decisions</p>	<p>Visions</p> <p>Developed collaboratively by senior business leaders and architects and then used to guide IT investments, identify, prioritize and launch new IT initiatives</p>	<p>Outlines</p> <p>Developed collaboratively by architects and business leaders and then used to evaluate, approve and fund specific IT initiatives</p>
IT-Focused	<p>Standards</p> <p>Developed collaboratively by architects and technical subject-matter experts and used to shape architectures of all IT initiatives</p>	<p>Landscapes</p> <p>Developed and maintained by architects and used to rationalize the IT landscape, manage the lifecycle of IT assets and plan new IT initiatives</p>	<p>Designs</p> <p>Developed collaboratively by architects, project teams and business representatives and then used by project teams to implement IT projects</p>

Lifecycles of EA Artifacts

	Rules	Structures	Changes
Business-Focused	<p>Considerations</p> <p>Developed once and then updated according to the ongoing changes in the business environment</p>	<p>Visions</p> <p>Developed once and then updated according to the ongoing changes in strategic business priorities</p>	<p>Outlines</p> <p>Developed at the early stages of IT initiatives to support decision-making and then archived</p>
IT-Focused	<p>Standards</p> <p>Developed on an as-necessary basis and updated according to the ongoing technology progress</p>	<p>Landscapes</p> <p>Developed on an as-necessary basis and updated according to the ongoing evolution of the IT landscape</p>	<p>Designs</p> <p>Developed at the later stages of IT initiatives to support implementation and then archived</p>

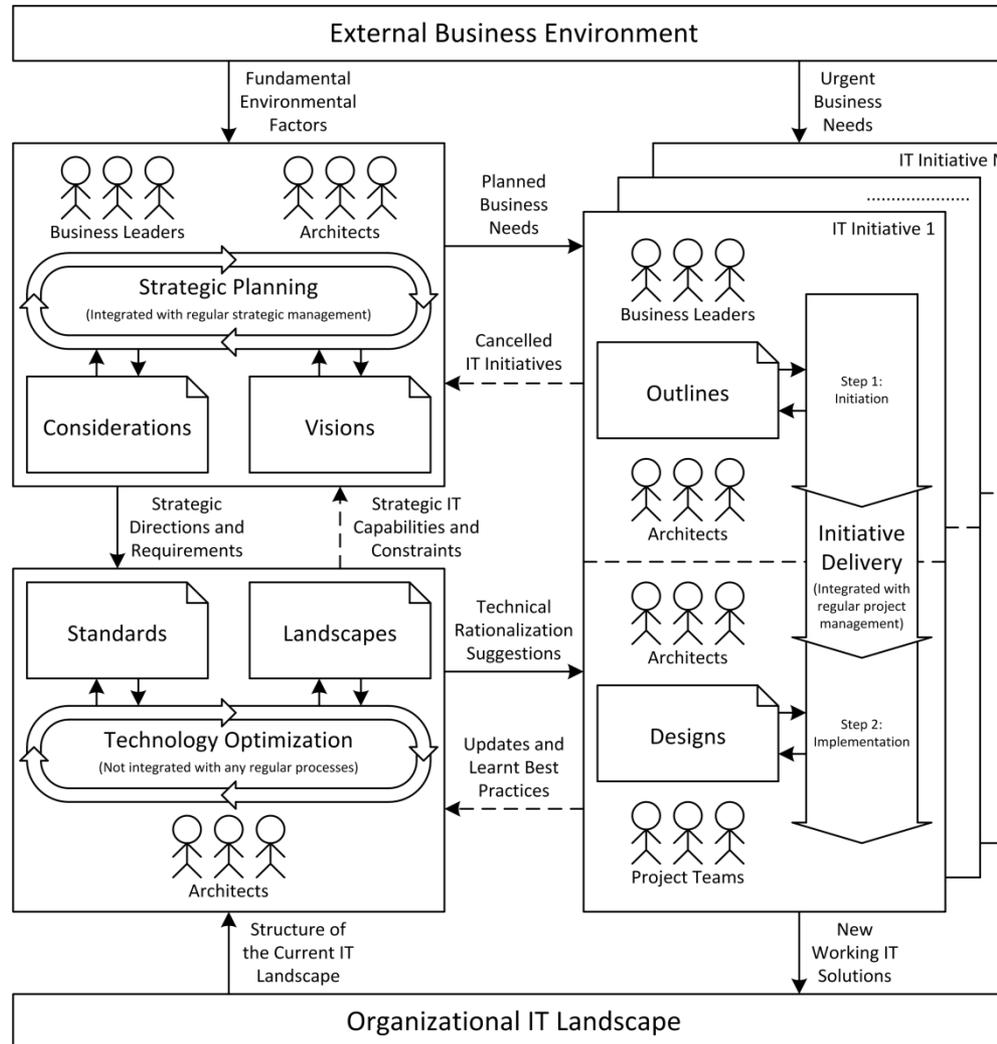
Purpose of EA Artifacts

	Rules	Structures	Changes
Business-Focused	<p>Considerations</p> <p>Help achieve the agreement on basic principles, values, directions and aims</p>	<p>Visions</p> <p>Help achieve the alignment between IT investments and long-term business outcomes</p>	<p>Outlines</p> <p>Help estimate the overall business impact and value of proposed IT initiatives</p>
IT-Focused	<p>Standards</p> <p>Help achieve technical consistency, technological homogeneity and regulatory compliance</p>	<p>Landscapes</p> <p>Help understand, analyze and modify the structure of the IT landscape</p>	<p>Designs</p> <p>Help implement approved IT projects according to business and architectural requirements</p>

Benefits of EA Artifacts

	Rules	Structures	Changes
Business-Focused	<p>Considerations</p> <p>Improved overall consistency between business and IT</p>	<p>Visions</p> <p>Improved strategic effectiveness of IT investments</p>	<p>Outlines</p> <p>Improved efficiency and ROI of IT investments</p>
IT-Focused	<p>Standards</p> <p>Faster initiative delivery, reduced costs, risks and complexity</p>	<p>Landscapes</p> <p>Increased reuse and agility, reduced duplication and legacy</p>	<p>Designs</p> <p>Improved quality of the project delivery</p>

Process View of EA Practice



Software Tools

MS Word

Considerations

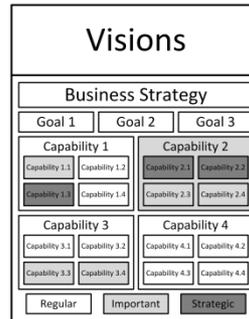
Business processes are standardized across all points of presence

All lines of business work with the shared list of customers

All business operations are maintained despite system failures

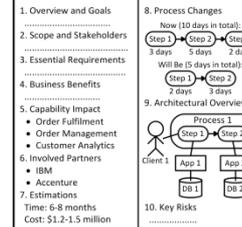
MS Visio

Visions



MS PowerPoint

Outlines



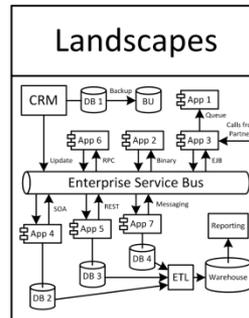
Standards

All applications should be implemented on the Java EE platform

All databases should use the Oracle RDBMS platform

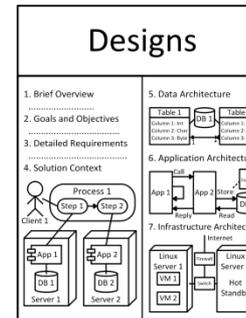
Enterprise Service Bus should be used to integrate all applications

Landscapes



MS Excel, CMDB

Designs



MS Word

Specialized EA Tools

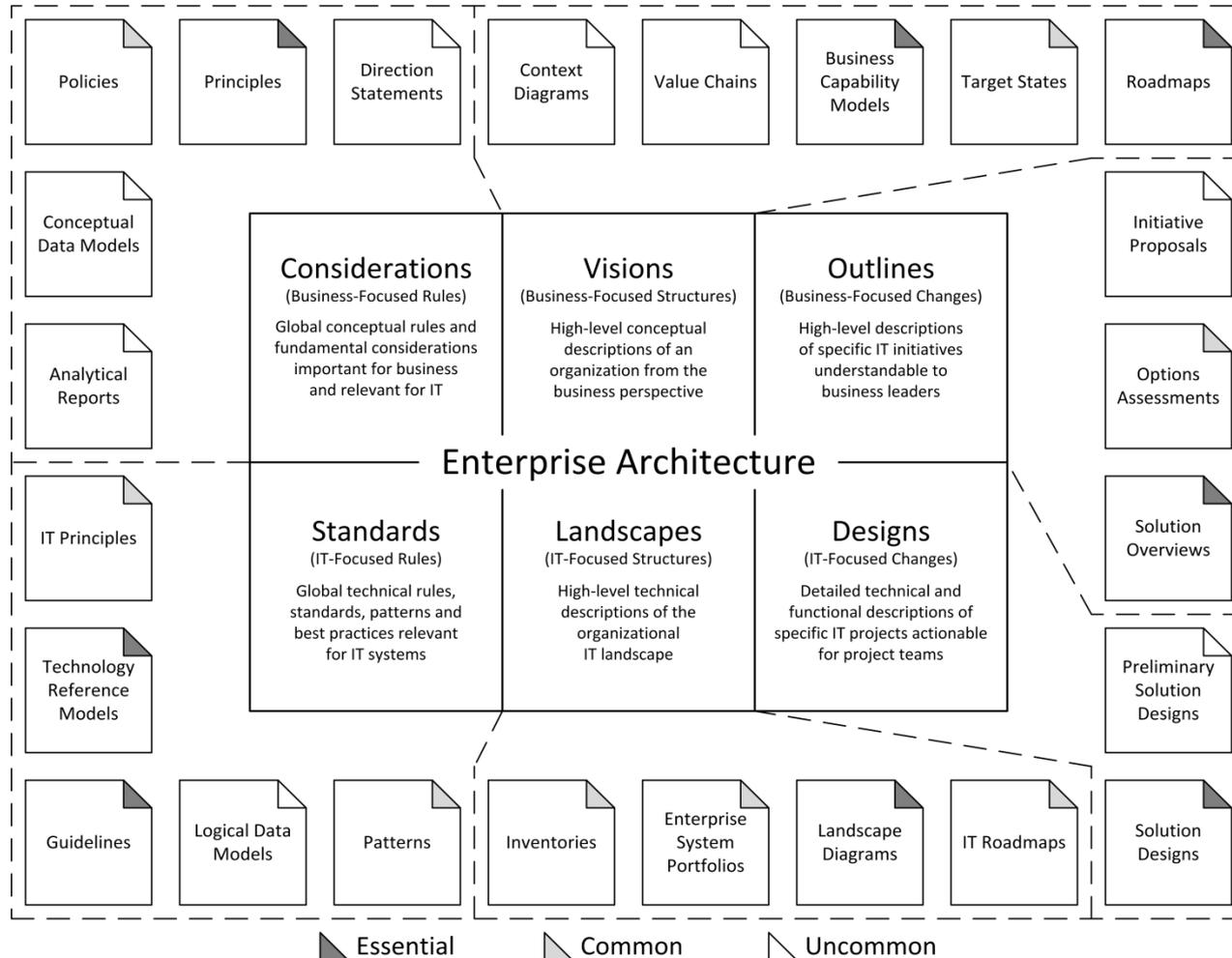
Benefits of the CSVLOD Model

The CSVLOD model of enterprise architecture has two major advantages over existing models:

- The CSVLOD model is realistic, evidence-based and reflects actual EA artifacts and related best practices
- The CSVLOD model is highly explanatory and describes many critical properties of EA artifacts including their contents, formats, stakeholders, usage, lifecycles, purposes and benefits
- The CSVLOD model helps understand how EA works

Enterprise Architecture on a Page

(Schematic view only, visit <http://eaonapage.com> for the full version)



Conclusions

Popular conceptualizations of enterprise architecture as four architecture layers, current states, future states and roadmaps are inadequate for understanding enterprise architecture

The CSVLOD model is the first research-based model of enterprise architecture which provides a more accurate, realistic and explanatory view than any other existing models

Questions?

Svyatoslav Kotusev

Enterprise Architecture Researcher

(kotusev@kotusev.com)

Visit <http://kotusev.com>