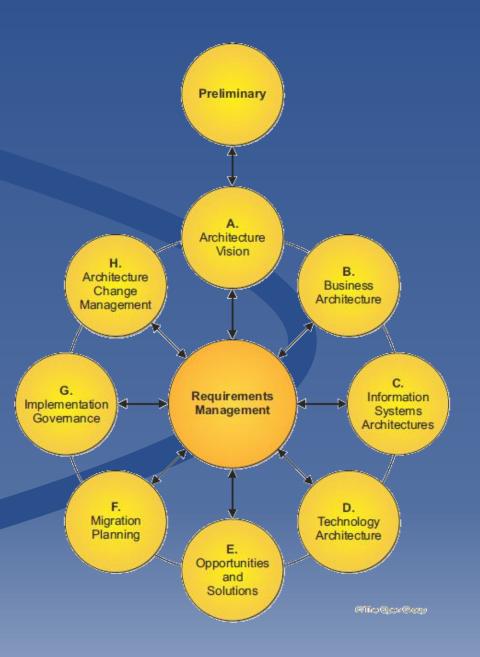
# TOGAF 10

## Summary & Lecture Notes

D. Vanderbist 18/05/2020



# Introduction & Core Concepts

## Introduction

TOGAF = The Open Group Architecture Framework

TAFIM = Technical Architecture Framework for Information Management (1995) by DoD DoD = Department of Defense

EA = Enterprise Architecture

Enterprise = a collection with a common goal/purpose

- EA applied to entire Enterprise or parts of it
- EA :
  - To optimize processes
    - Integrated environment
    - Responsive to change
    - Supporting the business strategy
  - To Balance:
    - Business transformation
    - Operational efficiency
  - Having an integrated strategy
  - Having Explainability:
    - Data privacy requires process to be documented and understood by untrained users



# Introduction

### EA Benefits:

- Strategic decisions taking
- Effective and efficient business operations
- Effective and efficient digital transformation
- Better ROI
- Better Procurement

### EA Drivers:

- Business Driver
- Technology Driver
- M&A
- Technical debt

### EA Stakeholders:

- Requirements
  - Identify
  - Trace & Address
  - Trade-off Balance

### EA Framework:

- Architectural Framework = Foundational Framework to create other architectures from
  - Processes
  - Standardization: reduce risk = standard process & approval
  - Best practices
  - Adaptable = specific uses cases
- Bounderless Information Flow = access to integrated information to support business process requirements
- Through the change process
  - support decisions process
  - Not after the change = only documentation



# Standard

TOGAF library:

- Fundamental Content
- Serries Guides

Foundation:

- ADM = Architecture Development Method
- ABB = Architecture Building Blocks
- SBB = Solution Building Blocks

Series Guides:

- O-AA: Open Agile Architecture
- DPBOK: Digital Practioner BOK
- IT4IT
- Archimate
- MSA: Micro Services Architecture



TOGAF:

- EA Framework
- Acceptance, production, use, maintenance of EA
- Iterative Process Model
- Best Practices
- Reusable Assets

ISO Architecture Definition:

- Concepts & Principles = part of a system
- System in environment = context
- Elements / Relationships of the system
- Design principles
- Evolution

TOGAF Architecture Definition

- Structure: Components & Interrelationships
- Principles & Guidelines
- Governance: Design & Evolution over Time



### Business Architecture:

- Organization
- Strategy
- Governance
- Processes

### Data Architecture:

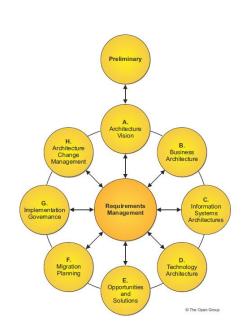
- Logic al
- Physical

### Application Architecture:

- Blueprint
- Link with Processes

Technology Architecture:

• SW/HW capabilities to supper business/data/application architecture



### ADM Phases:

- Preliminary: preparation and initial activities
- A: Architecture Vision: scope, stakeholders and approval (buy-in)
- B: Business Architecture
- C: Information Systems Architecture
- D: Technology Architecture
- E: Opportunities & Solutions: initial implementation planning
- F: Migration Planning: Baseline to Target
- G: Implementation Governance: Oversight over the implementation
- H: Architecture Change Management: manage change
- Requirements Management



## EA Services:

- Customer centric
  - Enterprise Support
  - Design Support
  - Development Support
  - Requirements Elicitation
- Internal Centric:
  - Architecture Planning
  - Architecture Practice Development

## EA Results:

- Deliverables = contractually specified work product , formally reviewed, approved and singed-off by stakeholders
- Artifact = work product that describes an aspect of the architecture
- Building block = re-usable component, combined to deliver architecture and solutions
  - ABB (contained in SBB's)
  - SBB
- Work products:
  - Catalogs
  - Matrices
  - Diagrams



### Abstraction:

Divide problem area in smaller problems areas that are easier to model => easier to solve

- Angle = view
- Level of detail

- Contextual:
  - To understand the environment and context
- Conceptual: understand the problem
  - What = requirements
  - What is necessary to resolve requirements
- Logical:
  - How: business, data, application, technology services
  - Logical component = { services }
- Physical:
  - Physical components to implement logical components



Principles:

- General guidelines/rules
- Enduring: seldom changed
- Enterprise principles:
- Decision making
- Hierarchical: Enterprise -> Subsidiary principles

Architecture principles:

- Architectural work related
- Linked to business objectives & key architecture drivers

Interoperability:

- The ability to share information and services
- Business interoperability: process sharing
- Information interoperability: information sharing
- Technical interoperability: resource sharing

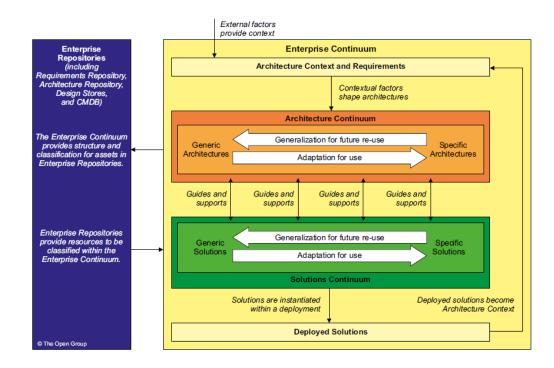
EAI:

- Presentation: same look & feel
- Information: same data
- Application: same components & apps
- Infrastructure: same infrastructure



Enterprise Continuum:

- Leverage/Specialize generic solutions to support individual organization
- Foundation Architecture = generic
- Organization Architecture = specific
   Blocks:
- Enterprise Repository
- Architecture Context & Requirements
- Architecture Continuum
- Solutions Continuum
- Deployed Solutions



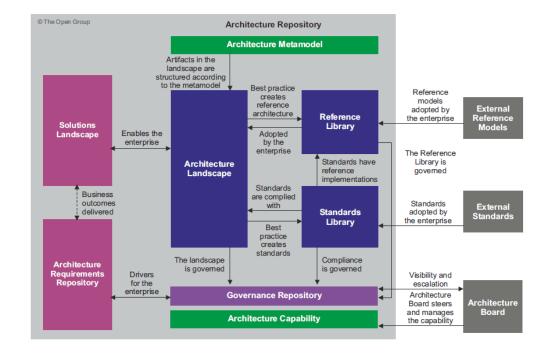


### Architecture Repository:

### Store output created by the ADM

- Architecture Metamodel:
  - information on the AF applied to local context
- Architecture Capability:
  - Governance of the Architecture Repository
- Architecture Landscape:
  - Assets deployed in the enterprise at a certain moment in time
- Library:
  - Standards
  - Reference = templates
- Governance Repository:
  - Governance activities across the enterprise
- Architecture Requirements Repository:
  - All requirements agreed by the Architecture Board
- Solutions landscape:
  - Building blocks deploy in the enterprise
  - SBB part of the landscape



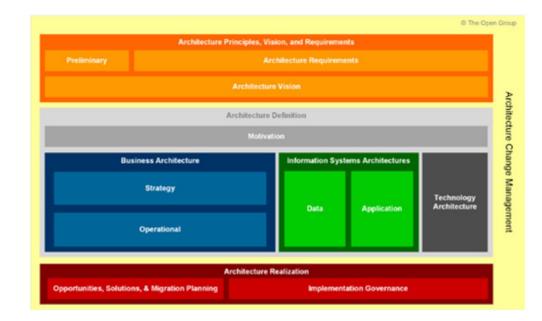


## Lifecycle:

- Inputs
- Outputs
- Steps

## Content Framework

- Application Repository: stores Artifacts and Works Products
- Content Framework: describes Artifacts and Building blocks = categorization
- Mapping of Architectural FW on Repository



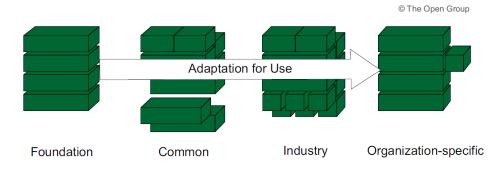
- Principles, Vision & Requirements
  - Preliminary (P)
  - Vision (A)
  - Requirements (R)
- Architectural Definition:
  - Business Architecture: Strat & Operation (B)
  - Information Systems Architecture: Data & Application (C)
  - Technology Architecture (D)
- Architecture Realization
  - Opportunities, Solutions & Migration Planning (E, F)
  - Implementation Governance (G)
- Architecture Change Management (H)

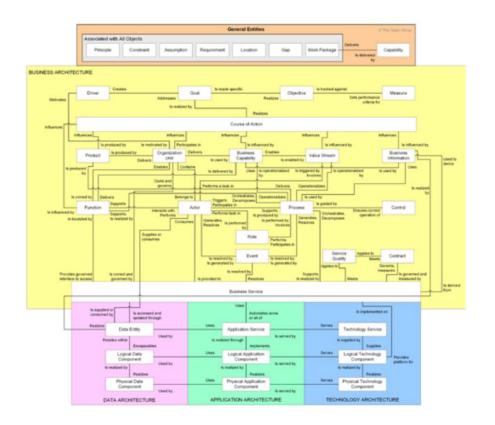


## TOGAF does prescribes:

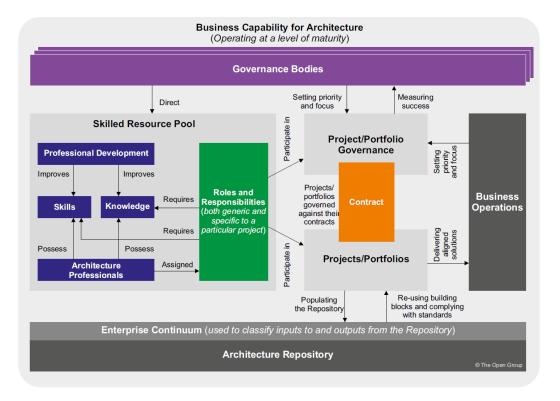
- Modelling notation:
  - Archimate
  - BPMN
  - UML

### Metamodel:









### Business Capabilities for Architecture:

- Governance Bodies
- Resource Pool:
  - Roles & Responsibilities
- Project/Portfolio Management
- Business Operations
- Enterprise Continuum
  - Repository

Architecture Capability:

- Run EA like any other business
- Governance = X-management -> financial management
- Benefits:
  - Transparency
  - Risk & Opportunity Management
  - Re-use



## TOGAF:

- On its own = generic deliverables
- In combination = specific deliverables of another FW
  - ITIL
  - CMMI
  - COBIT
  - PRINCE
  - PMBOK
  - MSP

### +

• TOGAF LIB:

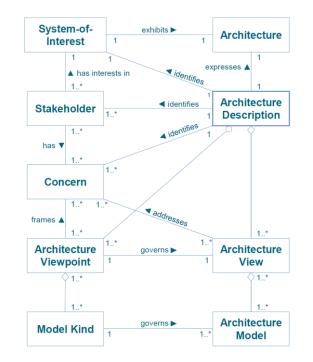
• ADM

IT4IT



## Viewpoints

- Extensions of the Architecture Content Metamodel
- Communicate with Stakeholders
- Focus on Stakeholder concerns



## Agility

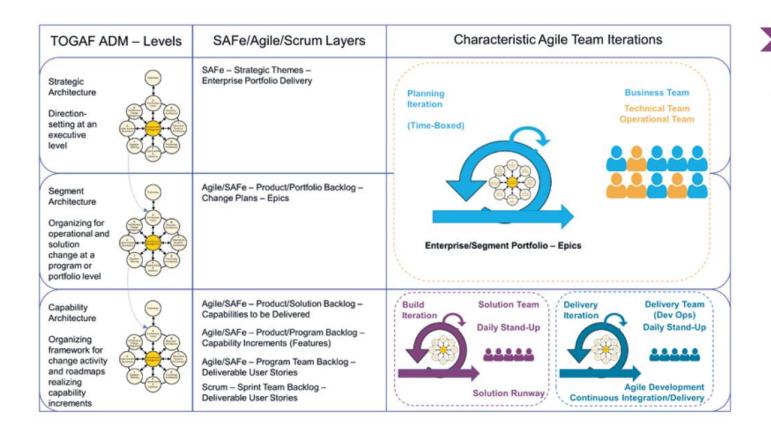
- React better to change
  - > Agile Software Concept of Agility
  - = Support continuous change
- Multiple Architectural Initiatives
  - Partitions = WBS of Architecture Initiatives
  - Levels = Levels of granularity

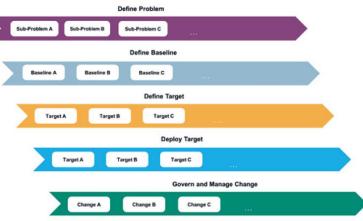
Risk Management:

- Operational Risk Taxonomy
- Operational Risk Analysis
  - Initial Risk Level
  - Residual Risk Level



# TOGAF – Agile Mapping







# Definitions

VDE

- Abstraction: summarized or generalized descriptions
- Actor: initiates or interacts with activities
- Application Architecture: interaction of application to provide key business capabilities
- Application Component: modular & replaceable
- Application platform: collection of technology components
- Application services: discrete behavior of an application
- Architecture: properties of a systems & structure of components
- Architecture domain: architectural area to be considered = business, data, application or technology

- Architecture Level: level of granularity
- Architecture Model: architecture applied to a concrete use case
- Architecture View: representation of a system from the perspective of a related set of concerns
- Architecture Viewpoint: a specification of conventions for a particular kind of Architecture View
- Baseline: specification that was formally reviewed and greed upon
- Business Model: a model describing how an enterprise creates, delivers and captures value
- Capability: an ability of an organization, person or system

# Definitions

- Capability Increment: a discrete portion of a capability that delivers a specific value, when all increments are completed the capability is realized
- Concern: in interest in a system from one or more stakeholders
- EA Service: an EA capability that delivers an EA functionality
- GAP: a statement of difference between two states
- Logical: implementation independent
- Objective: an SMART organizational aim
- Requirement: a statement of need

- Roadmap: an abstract plan for a business or technology change
- Service Oriented Architecture: SOA, on architecture that supports service orientation
- Strategic Architecture: a formal summarized description of an architecture for operational and change activities
- Target Architecture: future state of the architecture
- Transition Architecture: a formal description of one state of the architecture at a point in time
- Value Stream: end-to-end collection of activities that create an overall result

# Architecture Development Model (ADM)

# Introduction

### Enterprise Continuum

- Enterprise Repository
- Architecture Context & Requirements
- Architecture Continuum
- Solutions Continuum
- Deployed Solutions
- ... uses the Architecture Repository
- Reference Architecture
- Models
- Patterns = industry standards/models

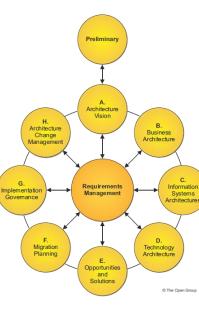
for max reuse and uses

- Architectural Source Material
- EA Governance process determines how it gets into the repository

### ADM cycles:

- From specific to Specific Architecture for the snapshot of the ADM cycle
- ADM Iterations:
  - Whole process
  - Between phases
  - In Phases
- Phases:
  - Each phase consist of detailed steps
  - Continuous requirements management in // of all phases
  - Output of one phase may-be modified by another phase
- Iteration:
  - Breadth
  - Depth
  - Time Period
  - Domain = Architectural Asset
- Version Management:
  - Version numbers
  - Documents: draft => accepted
- Foundation Architecture: Overall Enterprise Concerns





# Introduction

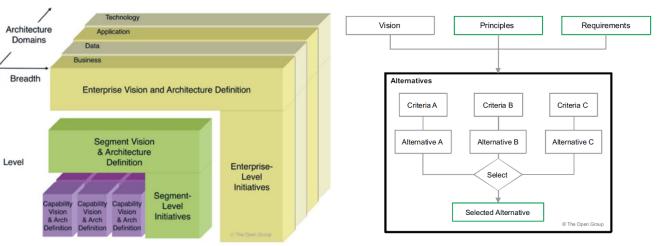
- Different:
  - Geographies
  - Economic Sector
- Adapt
- Integrate with other FW's
- Order of phases
- Governance:
  - Done by Architecture Board
  - Repository
    - Reference Data: EA Continuum
    - Status: Process Status
    - Audit Info: Actions / Decisions
- Scoping:
  - Scope to avoid duplicate/conflicting activities
  - Breadth:
    - Integration FW: stand-alone architecture project + publish-subscribe model
    - a federation of EA's
  - Depth:
    - Level of granularity; avoid unnecessary details
    - Sufficient detail for its purpose
  - Time Period:
    - As-Is = baseline
    - Transitive = incremental
    - Target = evolutive
  - Architecture Domains: business, data, application, technology

Architecture Domains:

- Purpose of the change: select domains that are affected
  - Business
  - Data
  - Application
  - Technology
- Risk: lack of consistency

### Alternative architectures:

• Trade-off Analysis





# Architecture Alternative Trade-Offs

### Alternative Architecture:

- Trade-off Analysis = compare alternatives
- Target Architecture = selected alternative

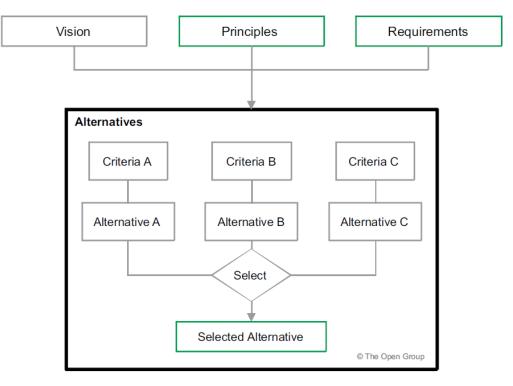
#### Criteria:

- Flexible
- Time
- Costs
- ROI
- Adherence
- Delivery Methods

### Steps:

- 1. Define Criteria
- 2. Describe Alternative
- 3. Gap analysis: Baseline <-> Alternative
- 4. Impact Alternative:
  - Existing Architectures = EA in other states
  - Planned Implementation Projects = other EA projects
  - Enterprise Risk

### Choose Alternative



#### Alternatives:

- Hidden Values
- Hidden Costs

# Preliminary Phase

### New EA:

- FW's
- Principles

### Objectives:

- EA Capabilities: Determine & Establish
- Can be revisited during Architecture Vision phase Inputs:
- TOGAF + other Libraries
- Non-Arch:
  - Board Strategy
  - Business plans
  - Governance FW's
  - Legal FW's
- Arch:



Existing Architecture FW

### Output:

- EA governance model
- EA trailered FW

### Adapt ADM to organizational context =

- Organizational Specific FW
- Interoperability between EA FW's and Business FW's Steps:
- 1. Scope the Enterprise Organization
- 2. Decide Governance and Support FW's
- 3. Define EA Team
- 4. Architectural Principles
- 5. Adapt TOGAF
- 6. Plan for Tools & Techniques

# Preliminary Phase

1. Scope the Enterprise Organization:

- Organizational Context: core units involved
- Define Enterprise:
  - Enterprise Scope
  - Stakeholders
  - Sponsors
- Organizational Context:
  - Culture
  - Stakeholders
  - Processes
  - Budgets
  - Plans
  - Skills & Capabilities
  - Baseline Architecture Landscape
- Business Requirements behind the Architecture Work

#### 2. Decide Governance and FW's:

- Governance:
  - How things added to repository
  - Process
  - Decisions
- Interoperability between EA and FW's used by the Business
  - Architecture Touchpoints
- FW's:
  - Business Capability Framework = business value
    - Portfolio/Program/Project Management = change
    - Operations Management = activities
    - Solution Development Management : systems
  - Architecture Development
- Relating FW's:
  - Business Planning initial direction
  - EA structured direction
- Capability Maturity Model:

•

Solution

Development

Methods

© The Open Group

Architecture Development

Method

Operations

Management

Methods

Portfolio, Program,

and Project

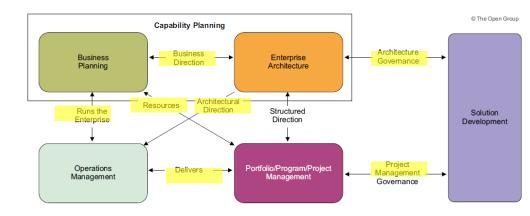
Management Methods

Business

Capability

Management







# Preliminary Phase

- 3. Define EA Team:
- Roles & Responsibilities
- Portfolio Management
- 4. Architectural Principles:
- Organizational Context => Business Principles
- Business Principles
- Architecture Principles

## 5. Adapt TOGAF:

- Tailoring:
  - Terminology
  - Content
  - Process
- 6. Plan for Tools & Techniques:
- Tools:
  - Level of formality
  - Level of maturity
- Single tool vs N-tools:
  - one license / one size fits all vs.
  - N licenses / best of breads



Principle:

- Rules/Guidelines
- Enduring
- Supportive to fulfill a mission Enterprise Principles:
- Basis for decision making
- Harmonize the way

Architecture Principles:

- Govern Architecture Process
- Develop/Maintain/Use Architecture
- Use of IT Resource & Assents

### Components:

- Name
  - Essence
  - No ambiguity
- Statement:
  - Fundamental Rule
- Rational:
  - Business benefit in business terminology
  - Relationships with other principles
- Implications:
  - Requirements on IT / Business
    - Cost/Benefit
    - Resources
    - Activities



### Influenced:

- Internally = strategy & plan
- External Constraints
- Current Systems & Technology
- Emerging Technology

### Qualities:

- Robust
- Stable
- Complete
- Consistent

### Types:

- Business Principles
- Data Principles
- Application Principles
- Technology Principles



### Applying:

- Decisions
- Evaluation Criteria
- Functional Requirements
- Portfolio
- Business Value
- Key: Tasks/Resources/Cots
- Assessment

Competing Principles:

- Choose
- Document Decision & Rationale

### Business Principles:

- Primacy of Principles
- Maximize Enterprise Benefit
- Information Management is Everybody's Business
- Business Continuity
  - Reliability
  - Recoverability = test recovery procedure
- Common Use of Application
  - No duplication: data consistency & resource waste
- Service Orientation
- Compliance with Law
- IT Responsibility
- Protection of IP

### Data Principles:

- Data is an asset
  - Decision making requires accurate/timely data
  - Data ownership => Data stewardship
    - Responsible for the day-to-day quality
      - Accessible
      - Usable
      - Safe
      - Trusted
- Dats is shared
  - Service sharing
    - One location & Service Integration
  - Data sharing
    - Multiple locations & Data Duplication
- Data is easily accessible
  - Data CRUD
- Data Trustee

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- Accuracy of the Data
- Currency of the Data
- Common Vocabulary and Data Definitions
- Data Security



Application Principles:

- Technology Independence
- Ease-Of-Use

Technology Principles:

- Requirements-Based Change:
  - IT change is an opportunity
  - Business change is a requirements
- Responsive Change Management
- Control Technical Diversity
- Interoperability
  - Data
  - Applications
  - Technology



# A: Architecture Vision

Objectives:

- Create Vision = high-level aspirations
- Approve Vision

Inputs:

- Non-Arch:
  - Business principles, goals, drivers

Output:

• Approved State of Architecture Work (SAW)

Steps:

- 1. Architecture Project = create project = container
- 2. Stakeholder Identification = concerns & requirements
- 3. Business goals, drives, constraints
- 4. Capabilities evaluation & readiness
- 5. Define Scope
- 6. Architecture Principles
- 7. Define Architecture Vision
  - 1. Target Architecture Value
  - 2. Change Management = risk & activities
  - 3. SAW = Statement of Architecture Work



## A: Architecture Vision

- 1. Architecture Project = create project = container
  - 1 ADM cycle = 1 project following the enterprise project management FW
- 2. Stakeholder Identification = concerns & requirements
  - Stakeholder Map: power / interest
  - Stakeholders:

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- Corporate Functions = CxO's
- End-Users
- Project organization
- Systems Operations
- External: Suppliers / Regulatory Bodies
- Who?
  - Has Concerns
  - Not interest in architecture
  - Decisions Maker:
    - Timing
    - Trade-offs
    - Status
    - Budget
    - Compliance
    - Confidence
- Identify:
  - Candidate components
  - Scope boundaries
  - Concerns



- Communicate
- Viewpoints
- Views

- 3. Business goals, drives, constraints
- 4. Capabilities evaluation & readiness

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- Enterprise Capabilities = business capabilities
  - Business architecture
- EA = architecture capabilities
  - ADM execution
    - Skills = people
    - Processes
    - Tools = technology
- Baseline & Target Capabilities
- Value Chain Diagrams
- Readiness: quantify the readiness to change
- 5. Define Scope = what is in/out the Architecture effort
  - Breadth
  - Depth
  - Domain
  - Time
  - Assets
  - Partitioning

# A: Architecture Vision

- 6. Architecture Principles
  - Business Principles
  - Architecture Principles
- 7. Define Architecture Vision
  - Develop Vision = will guide other phases
    - Policy Development
    - Strategic Decisions
  - High-level view:
    - Baseline & target
  - Business Model
    - How to drive value
      - Business capabilities
      - Values Streams
      - Organizational Maps
    - Opportunities of emerging technologies & vision
  - Business scenario's => business requirements
    - Problem
    - Environment
    - Objectives
    - Actions: human & computer
    - Roles & responsibilities
    - Refine

- 1. Target Architecture Value
  - Business case
    - Value
    - KPI's
    - Risks
- 2. Change Management = risk & activities
  - Risk levels:
    - Catastrophic
    - Critical
    - Marginal
    - Negligible
  - Risk:
    - Risk mitigation
    - Initial risk => Residual risk
- 3. SAW = Statement of Architecture Work
  - SAW = WBS
  - Define performance metrics for ADM cycle

# Stake Holder Management

Stakeholders:

- Shape Architecture
- Win Resources
- Give Bette Understanding
- Anticipate Reactions
- Resolve Confliction Objectives
   Approach:
- Stakeholder
- Concern
- View
- Viewpoint

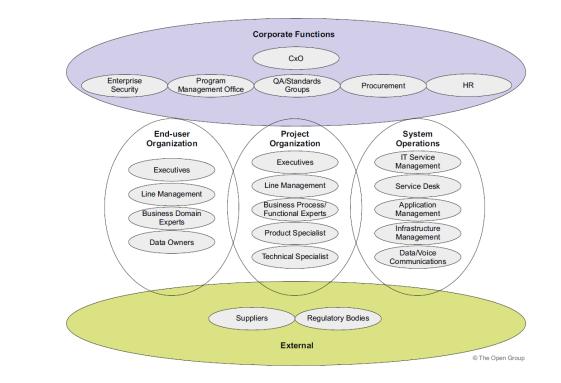


Stakeholder Management Process:

- 1. Identify Stakeholders
- 2. Classify Stakeholders
- 3. Determine Management
- 4. Tailor Deliverables

# Stake Holder Management

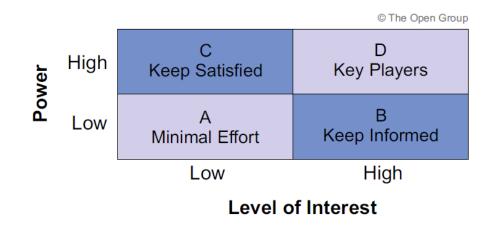
- 1. Identify Stakeholders
  - Who is
    - Affected
    - Has influence over
    - Power over
    - Interest in Success/Failure
  - Who
    - Controls
    - Designs
    - Decides
    - Procures
  - Analysis
    - Corporate Functions
    - End-User Organization
    - Project Organization
    - System Operations
    - External



## Stake Holder Management

- 2. Classify Stakeholder Positions:
  - LMH
  - Ability to disrupt
  - Current / Required Understanding
  - Current / Required Commitment
  - Required Support
- 3. Determine Management
  - Power
  - Interest
  - Influence:
    - Keep Satisfied = CxO's
    - Keep Informed = Supporting Functions
    - Key Players = Experts Process / Data / Technology / Security

Stakeholder Group		Disrupt	Under-	Required Under- standing	Commit-	•	
CIO	John Smith Jeff Brown	H M	M M	H M	L	M M	H M





### Architecture Patterns

### Pattern

- Idea useful in a certain context
- Probably also useful in other contexts

### Building Blocks vs Patterns

- Building Blocks
  - Proven
  - What you use
- Pattern
  - Promise
  - How you use building blocks
    - When
    - Why
    - Trade-offs

EA vs Software Architecture:

- Software Architecture Pattern =
  - high-level design pattern
  - Structural organization
  - Design Pattern = component decomposition
  - Idiom = programming code

### Pattern:

- Name
- Problem
- Context = pre-condition
- Forces/Constraints = how does it affect the outcomes / goals = \*-abilities
- Solution
- Resulting Context = post-condition
- Examples
- Rational = how it solves forces/constants and achieves objectives/goals
- Related Patterns
- Known Issues

## **Business Transformation Readiness**

Readiness Factors:

- 1. Determine
- 2. Present = Maturity Model
- 3. Assess
- 4. Assess Risks

- 1. Determine
  - Examples:
    - Vision
    - Desire
    - Need
    - Business Case
    - Funding
    - Sponsorship & Leadership
    - Governance
    - Accountability
    - Execution Model
    - IT Capacity to Execute
    - Enterprise Capacity to Execute
    - Ability to Implement & Operate
- 2. Present = Maturity Model
- 3. Assess
- 4. Assess Risks

### **Business Transformation Readiness**

- 2. Present = Maturity Model
  - Current Maturity Level
  - Target Maturity Level
  - Maturity Level
    - Description
    - Level: L -> H
      - Not Defined
      - Ad Hoc
      - Repeatable
      - Defined
      - Managed
      - Optimized

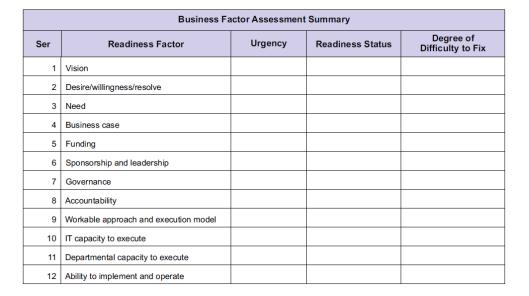
	Business	Transformation Readin	ess Assessment - Matur	ity Model		
Fac	tor 2: Need for Enterprise		Class	Organizational Co	ontext	
Ir	formation Architecture		BTEP Readiness Fac	tor YES		
Definition			nation is a strategic corpo rsally understandable, of r			
		Maturity M	odel Levels			
0 Not defined	1 Ad Hoc	2 Repeatable	3 Defined	4 Managed	5 Optimized	
Information is not recognized as an asset. There is no clear stewardship of data.	Data Management (DM) concepts are intuitively understood and practiced on an <i>ad hoc</i> basis. Stewardship of the data is informal. Data is recognized by certain internal experts and senior management as being of strategic importance to the organization. Focus is primarily on technically managing redundant data at the applications level.	Many parts of the organization value information/data as a strategic asset. Internal DM experts maintain clear lines of responsibility and stewardship of the data, organized along lines of business and at all senior levels. Staff put into practice DM principles and standards in their daily activities.	Data is recognized as a strategic asset in most parts of the organization, and throughout most levels from operations to senior management. Resources are committed to ensuring strong stewardship of data at the lower management and information expert levels.	Data is recognized as a strategic asset in all parts of the organization, and throughout most levels from operations to senior management. Resources are committed to ensuring strong stewardship of data at the senior management and information expert levels.	Optimized Data is treated in all levels throughout the organization as a strategic asset to be exploited and re-used. Data products and services are strongly integrated with the management practice of the organization. All staff are empowered and equipped to take stewardship of information, and are seen as "knowledge workers".	
				Recommended Target State		



## **Business Transformation Readiness**

### 3. Assess

- Vision
  - Target State of Factor
- Rating
  - Importance of Factor
    - Urgency
    - Readiness Status: Low -> High
      - Low
      - Fair
      - Acceptable
      - Good
      - High
    - Difficulty to Fix
- Risks & Actions
  - Action = Implementation/Migration Plan
  - Risk = Risk Mitigation



### Goals

Importance / Accessibility (Obtainability)



### Goal Catalog:

- Name
- Description
- Kind: goals / objective
- Global: enterprise / local
- Type: qualitative / quantitative
- Required level of satisfaction: evaluated / firm
- Unit of measurement
- Target Value
- Current Value
- Problems: obstacles
- Source: origin of goal



### B: Business Architecture

#### Objectives:

- Target Business Architecture
  - Operate: business goals
  - Respond: strategic driver in Architecture Vison
  - Follow: SAW & Stakeholder Concerns
- Roadmap:
  - Gaps
  - Baseline => Target

#### Inputs:

- Non-Arch:
  - Request for Architecture Work
- Arch:
  - EA Organizational Model
  - Architecture FW
  - Architecture Vision

#### Outputs:

- Draft Architecture Definition
- Draft Architecture Requirements Specification

### Business Services/Products



### EA for:

- New Business
- Existing Business

#### Steps:

- 1. Select: model, viewpoints and tools
- 2. Baseline
- 3. Target
- 4. Gap Analysis
- 5. Candidate Roadmap
- 6. Resolve Impacts
- 7. Stakeholder Approval
- 8. Finalize Business Architecture
- 9. Update Architecture Definition document

### B: Business Architecture

- 1. Select: model, viewpoints and tools
  - Select from Architecture Repository
  - Identify appropriate tools & techniques
    - Catalogs
    - Matrices
    - Diagrams
  - Techniques:
    - Business Capability Mapping
    - Information Mapping
    - Organization Mapping = Org. Structure
    - Process Modelling
    - Use-Case Analysis
    - Value Stream Mapping
  - Business Scenarios:
    - Business Requirements => Technical Requirements

- Business Model:
  - Missing Business Capabilities
  - New Values Streams
  - Changes to organizational units
- Business Capabilities Map:
  - Heat map each capability of business
    - Effectiveness
    - Performance
    - Value
- Value Stream:
  - Stages in value streams => Business Capabilities



### B: Business Architecture

- Organizational Mapping:
  - Organizational Units + hierarchical structure + relationships
- Information Maps
  - Domains = Major information Entities
  - Relationships between entities
- Modeling:
  - Activity Models: BPMN
    - BPMN
    - ICOMS =
      - Input
      - Controls
      - Output
      - Mechanism/Resources
  - Use-Case Models
  - Logical Data Model: Class Diagram



## Gap Analysis

### Gap

• Shortfall between Baseline and Target Architecture

### Type of Gaps

- Business Domain Gaps
- Data Domain Gaps
- Application Impacted
- Technology Impacted

### Managing Gaps:

- ABB Matrix
- Baseline vs Target ABB:
  - New Services
- Eliminated Services
  - Included/Matched Services

Target → Architecture Baseline Architecture ↓	Video Conferencing Services	Enhanced Telephony Services	Mailing List Services	Eliminated Services
Broadcast Services				Intentionally eliminated
Video Conferencing Services	Included			
Enhanced Telephony Services		Potential match		
Shared Screen Services				Unintentionally excluded - a gap in Target Architecture
New		Gap: Enhanced services to be developed or produced	Gap: To be developed or produced	© The Open Group

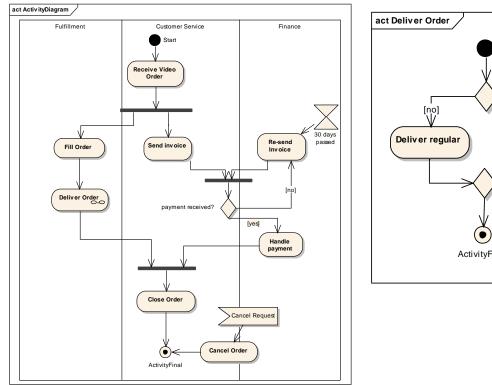
### **Business Services**

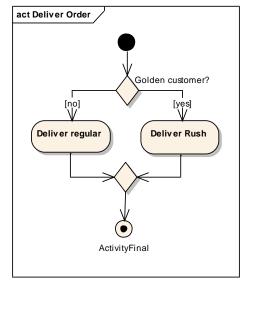
### **Business Service View**

Banking Service	s		Delivery			đ	Process						Risk	
Produ	ct & Marketing		Sales Sales Contact Centre				Operations						Risk & Co	ompliance
Marketing	Market Data		Channels Branch Location Hinemt.	Sales Prospect Campaign Executio	Servicing Servicing Issue		Loans & Deposits	Investment lingmt.	Trade Bankin	1	Payments Payments Execution		Models Financial Inst	Valuation Models
Business Development Brand Mngmt, Advertising Promotional Events Prospect Campaign Mngmt, Prospect Campaign Mngmt, Customer Campaign Mngmt, Customer Campaign Mngmt,	Araket Information Mognit,     Financial Market Analysis     Forests Financial Market Analysis     Financial Market Research     napalign Mognit,     Araket Data Switch Admin     mayalign Design,     Market Data Switch Admin     mayalign Design,     Counterparty Administration     reveys     Public Reference Data Mingnit,		Contact Centre Magnit. Contact Centre Magnit. Branch Network Magnit. Adv. Voice Services Magnit. ATM Network Magnit. Contact Centre Operations Branch Location Operations Adv. Voice Services Operations	Prospect Mogmt. Lead/Opportunity Mogmt. Customer Campaign Executi Customer Offer Sales Planning Product Matching Product Expert Sales Suppor	Case Root Cause Analysis on Card Case Customer Order Payment Order	Case Root Cause Analysis Card Case Customer Order	Current Account Deposit Account Corporate Current Account Corporate Loan Mortgage Savings Account	Planning Inventes, Portfolio Anali	Bank Guarantee nis Credit Mogot. nt. Credit Facility Cash Mogot. & A Services	is Credit Ningnt, t. Credit Facility Cash Ningnt, & Account Services Direct Dabit Nandate		<b>B</b>	Gap Analysis Gredit Risk Models Liquidity Risk Models Economic Capital Business Risk Models Fraud Models Credit/Margin Management Production Risk Models	
Customer Surveys Corporate Communication Product Management			Public Reference Data Mngmt.		ATM Network Operations Product Sales Support Branch Currency Mngmt. Sales Product Branch Currency Distribution		TT I		Cards	Collateral Operational	Operational Ser	rioes	Account Mngmt. Position Keeping Reward Points Account	
Product Design Product Design Deployment Product Training Product Quality Discourt Pricing Conditions	Estensi Agency Information Provider Admin Product Service Agency Contractor /Supplier Agreem Party Party Party Data Megent. Customer Profile	ent	Cress Channels Party Authentication Transaction Authonisation Servicing Development Conduct Dislogue Conduct Dislogue	Customer Megent. Customer Relationship Mage Customer Pred/Service Digblity Customer Agreement Seles Product Agreement Customer Credit Rating Customer Credit Rating Customer Freeneme Data M Customer Precedents	ıt	1	Credit/Charge Card God Argherisation Card Billing & Payments Card Billing & Payments Consumer Services Consumer Arbodict Consumer Venduct Consumer Involucit Consumer Involucit Service Product		Diblarament Open Isem Magn Customer Billing Revard Pohts A Channel Activity Channel Activity	wards & Rec Analysis	Accurat Recivalie Accurat Reconciliation Counterparty Rok Hostion Algent. Fraud Detection Transactive Engles Product Combination		Regulation Complian Guideline Con Regulatory C Compliance F Fraud/AUL & Francial Reg Legal Compli- Internal Addi Regulatory an	ide mpliance impliance leporting esolution orting ance
_	Innevation & Strategie	_			tter prise and En			Buildings, Equipment	Rusiness Command	×	nowledge &			Business Direct
Technology Bervises IT Systems Direction IT She B Guidelens Systems Administration Development Environment Production Release Systems Operations Systems Help Desk Systems Aurance Internal Iletwork Operation	Delivery Program Management Quality Management Cost, Time and Scope Risk/sizue Management Innovation & Initiatives	Financial Stater Financial Contre Financial Compt Enterprise Tax Administration Nariert Risk Not Financial Accou	Business Intolligence & Analytics ents Segment Direction Product Partfolio Banch Portfolio Channel Portfolio Channel Portfolio	Bank Perfolio & Treasury Analysis Corporate Treasury Analysis Asset Securitation Asset & Liability Alegent. Bank Portfolio Analysis Bank Portfolio Ana	Security Assurance Approved Supplier Directory Procurement Company Billing & Payments	Hur Eng Eng Eng Eng Eng Eng Eng Wor Rec Inte	nan Resources Direction ployee Assignment ployee Data Management ployee/Contractor Contract ployee Certification ployee Evaluation ployee Evaluation	and Facilities Property Portfolio Site Operations Site Administration Equipment Administration Equipment Maintenance	& Control Organization Direction Business Unit Financial Analysis Business Unit Financial Operations Business Unit Accounting Business Unit Accounting Business Unit Manageme	Magm Intella Portfo Knowl Dock Aro ot	Magent.     Gordensee     Gordensee	porate A	Relations Illiance/Stakeholder Ielationship	Business Direct Corporate Strateg Corporate Policies Product & Service Business Architect Continuity Plannis

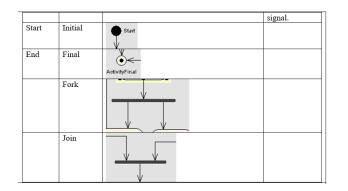


# Activity Diagram



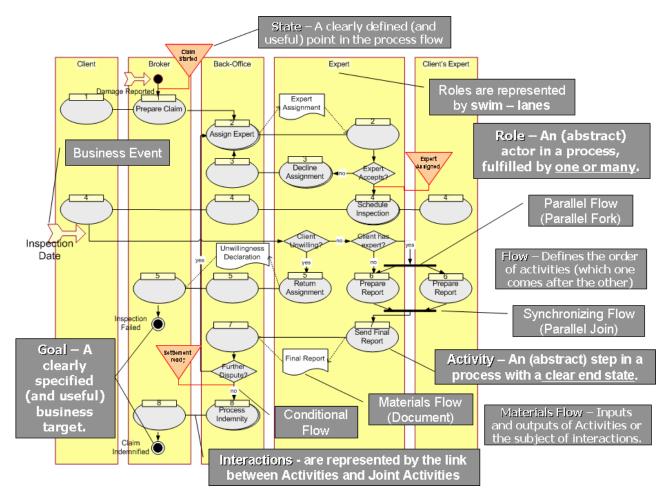


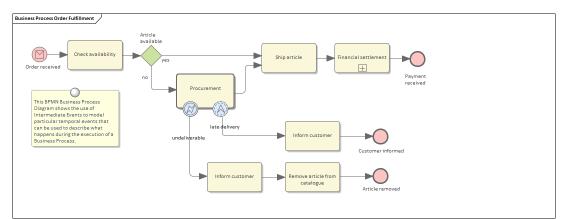
Role	Swimlane	Fulfillment	Customer Service	Т
Activity	Activity	Receive Video Order		
	Structured activity	Deliver Order		Double clicking on this node will bring you to the activity diagram of this structured activity
Decision	Decision node	[no]	customer?	
Trigger	Receive	30 days passed Cance	I Request	You can have trigger based on time or based on receiving a





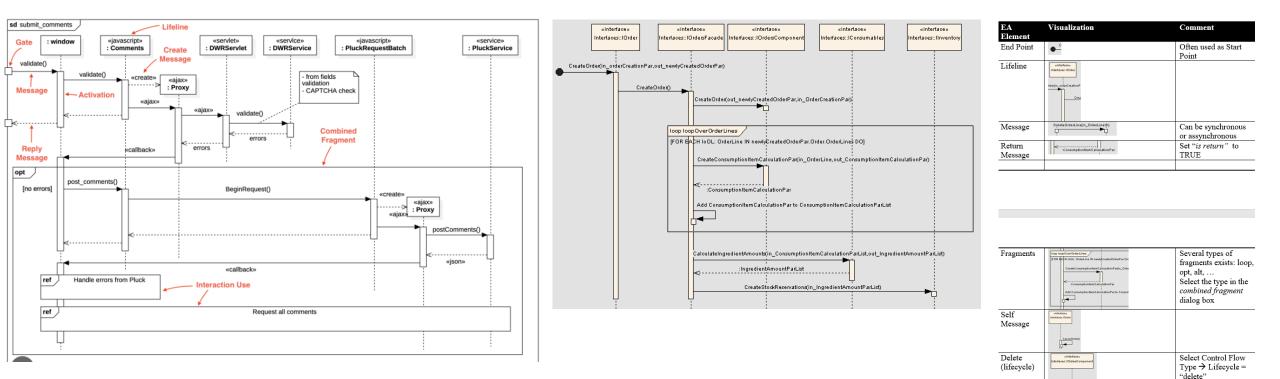
### Process Model







## Sequence Diagram



Select Control Flow Type → Lifecycle =

"new"

«interface» rfaces::IOrdetsComp

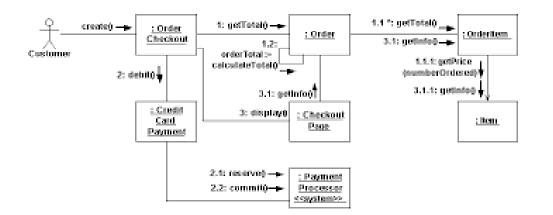
eriD)

«interface» Interfaces:IOrder

Create

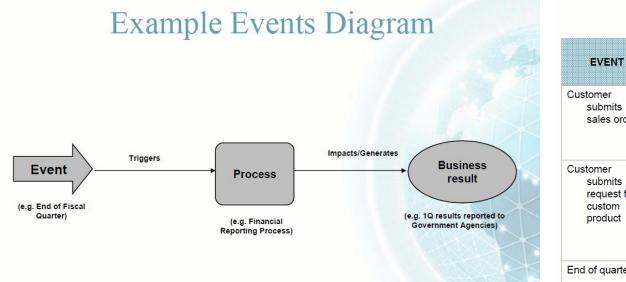
(lifecycle)

## Collaboration Diagram





## Event Diagram

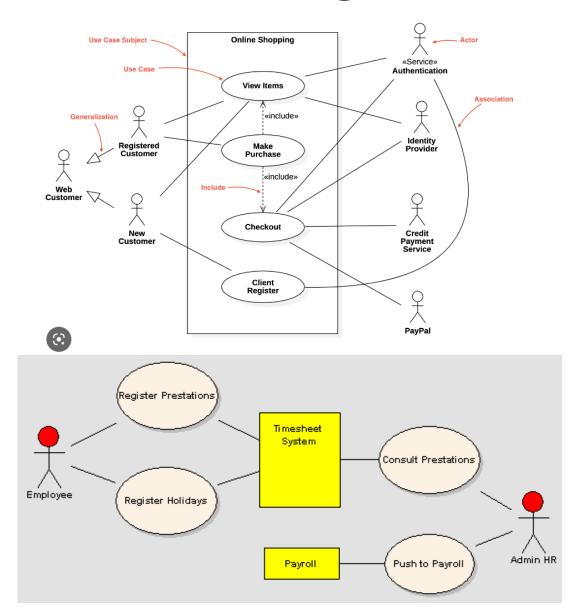


### Example Events Matrix

EVENT	PROCESS TRIGGERED	BUSINESS RESULT(S)
Customer submits sales order	Sales order processing Create & save sales order Generate acknowledgement Confirm receipt of customer order Begin order fulfillment activities	<ul> <li>Sales order captured in order book</li> </ul>
Customer submits request for custom product	Custom product configuration Capture requirements from customer Define custom specifications Price custom configuration Negotiate with customer Secure approval from customer regarding configuration and price	<ul> <li>Custom product configured</li> <li>Customer contract signed</li> </ul>
End of quarter	Financial reporting process	<ul> <li>Financial report generated</li> </ul>



## Use Case Diagram



Use case	-Push to Payroll	
Actor	Admin HR	
Part	Timesheet System	
Associate	Register Holidays Employee	
Include	Register ProjectHours «include» Register Prestations «include» Register Benchhours	Not advisable to use in AE projects
Boundary	Use Case1 Use Case2	To group certain elements together

### ACTOR/Role RACI

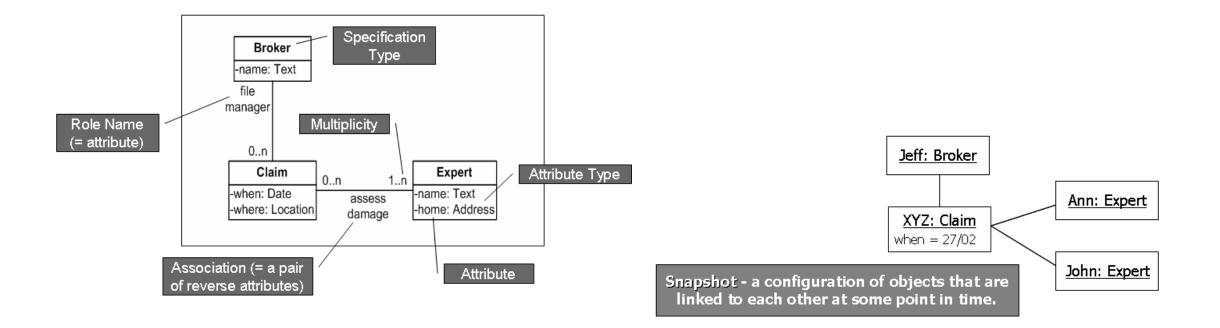
### Actor/role Matrix

• This matrix show which actors perform which roles, supporting definition of security and skills requirements.

	Offi CIO A	ce of ctors		ering ( Actor		Bu	siness Actors		St		and A Actors		cture	Implen	tructure nentation			
R = Responsible for carrying out the role A = Accountable for actors carrying out the role C = Consulted in carrying out the role I= Informed in carrying out the role Strategy Lifecycle Roles	cio	Enterprise Architect	Enterprise Design Authority	Technical Design Authority	IT Management Forum	Business Unit Head	Business Unit Service Owner	Business Unit Application Architect	Head of Strategy and Architecture	Infrastructure Strategist	Infrastructure Solution Architect	Architecture Configuration Mgr	Enterprise Infrastructure Architect	Head of Implementation	Infrastructure Designer	IT Operations	Project Manager	External Vendors / Suppliers
Architecture Refresh		R			с	с	R	С	с	С			R			С		C
Architecture Refresh Architecture Roadmap		C	A	-	R	c	C	U I	c	R		-	R	C		C	-	C
Benefits Assessment						- C	- C	-	-		R	_	R	L L		c	A	L.
Change Management		c		- i-	A	- i -		1	R		1		R	R		c	-	
Framework Refresh		c	с	c	ĉ	c		c	A			-	R	C		c		-
Project Lifecycle Roles		Ŭ	0	Ŭ	Ŭ	Ŭ	<u> </u>	Ŭ	~	<u> </u>				0				
Solution Architecture Vision				Α	1	1	с	С	1	1	R		С			С	R	
Logical Solution Architecture				A	- i	i	С	С	1	i	R	- i	C		С	C	R	
Physical Solution Architecture				Α	1	1	С	С	1		R	1	С		R	С	R	
Design Governance				Α		1	С	C			R	1	С		R	С	С	
Architecture Configuration Management				С					1	1	R	R	R				Α	



# Information Model – Logical Data Model





# C: Information Systems Architecture

Objectives:

- Target Information Systems Architecture in line with
  - Architecture Vision
  - Business Architecture
- Contains:
  - Data Architecture
  - Application Architecture
- Roadmap

- Packaged Solutions
  - Like CRM/ERP
  - Often combine data & application architecture and technology architecture



## C: Information Systems Architecture – Data Architecture

Objectives:

- Target Data Architecture in line with
  - Architecture Vision
  - Business Architecture
- Roadmap

Inputs:

- Arch:
  - Data Principles
  - Data Architecture Requirements Specifications
  - Business Architecture Components
  - Architecture Roadmap

### Outputs:

VDR

- Draft Architecture Definition
- Draft Architecture Requirements Specification

Steps:

- 1. Select: model, viewpoints and tools
- 2. Baseline
- 3. Target
- 4. Gap Analysis
- 5. Candidate Roadmap
- 6. Resolve Impacts
- 7. Stakeholder Approval
- 8. Finalize Business Architecture
- 9. Update Architecture Definition document

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## C: Information Systems Architecture – Data Architecture

- 1. Select: model, viewpoints and tools
  - Data:
    - Time Dimension = real-time, event driven
    - Location Dimension = business process
  - Data Type:
    - Enterprise Level Data
    - Local-Level Data = personal DB's & Spreadsheets
  - Modelling:
    - ER-Diagram
    - Class Diagram
  - Data Architecture:
    - Creation
    - Distribution
    - Migration
    - Security
    - Archiving ... of Data
    - Date Entity => Logical Data Component => Physicial Data Component
      - Data Entities = ER
      - Logical Data = ER + Attributes
      - Physical Data = Table definition model

- Data Structure:
  - Data in Rest
  - Data in Motion = Transit
  - Data in Use
  - Open Data
- Data Migration:
  - ETL
  - ELT
- 9. Update Architecture Definition document
  - Business Data Model
  - Logical Data Model
  - Data Management Process Model
  - Data Entity/Business Function Matrix
    - Which BU owns/stores data
  - Data Interoperability Requirements



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# C: Information Systems Architecture – Application Architecture

Objectives:

- Target Data Architecture in line with
  - Architecture Vision
  - Business Architecture
- Roadmap

Inputs:

- Arch:
  - Application Principles
  - Data Architecture Requirements Specifications
  - Business and Data Architecture Components

Outputs:

- Draft Architecture Definition
- Draft Architecture Requirements Specification

Steps:

- 1. Select: model, viewpoints and tools
- 2. Baseline
- 3. Target
- 4. Gap Analysis
- 5. Candidate Roadmap
- 6. Resolve Impacts
- 7. Stakeholder Approval
- 8. Finalize Business Architecture
- 9. Update Architecture Definition document



## C: Information Systems Architecture – Data Architecture

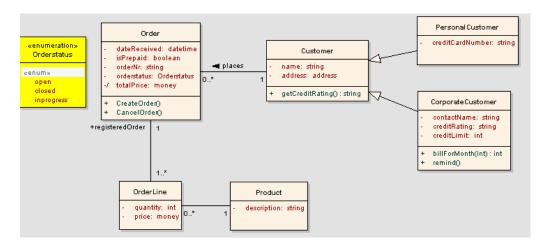
- 1. Select: model, viewpoints and tools
  - MDA = Model Driven Architecture
    - Platform independent description of business logic
  - Application Portfolio => Applications => Application Components
    - Logical Applications
    - Physical Applications
  - Logical Application Component -> Physical Application Component => Application Service
    - Generic Business Models
    - Application Models
  - Requirements:
    - Mapping Business Services => Application
    - User & Organizational dependencies on Applications
  - COTS:
    - Configuration
    - Modules
    - Application Services
  - Custom:

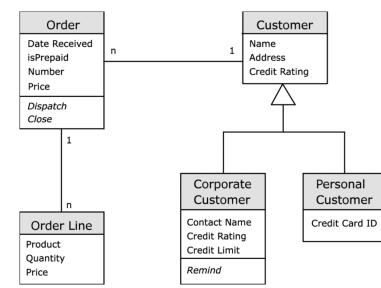


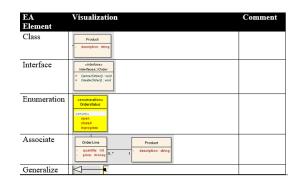
- Modules
- Sub-Systems

- 2. Baseline
  - Application Portfolio Catalog
- 9. Update Architecture Definition document
  - Business Data Model
  - Logical Data Model
  - Data Management Process Model
  - Data Entity/Business Function Matrix
    - Which BU owns/stores data
  - Data Interoperability Requirements

## Class Diagram







Association class	Employee ddddde ddrifen ddddde ddrifen ddedde ddrifen eddat ddrifen eddat ddrifen ddedde ddrifen eddat ddrifen tadate ddrifen ddat ddrifen tadate ddrifen ddat ddrifen tadate ddri	
Compose		
Aggregate		
Attribute Operation	Customer     - Address       - Address:     - Address       + get/constrainting): ming     - Address	Not always drawn on class level
Object	Jan Courtemer Adfores = Azalealaan 30, Zeeteel name = Jan	When you paste a class to a diagram as an instance of that class



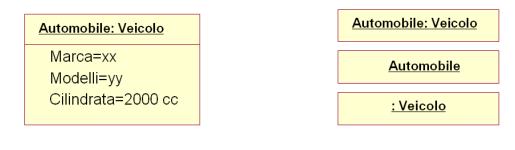


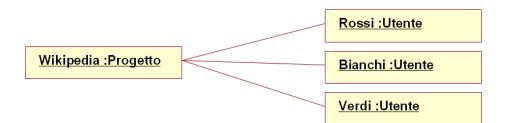
62

Jan :Customer

## Object Diagram

### **Object Diagram**





address = Azalealaan 30, Zoersel orderNr = BE457879AZ name = Jan isPrepaid = no dateReceived = 15/11/2007 line2 :OrderLine line3 :OrderLine line1 :OrderLine quantity = 3 quantity = 1 price = 2 price = 12 price = 41 quantity = 4 product3 :Product product1 :Product product2 :Product description = chair description = table description = table-leg

:Order totalPrice = 89

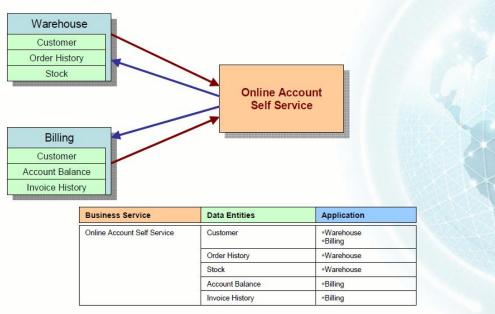
orderstatus = inprogress

EA Element	Visualization	Comment
Object	<u>Jan :Customer</u> address = Azalealaan 30, Zoersel name = Jan	
Association	Line3 :OrderLine quantity = 1 price = 41 product3 :Product description = table	No multiplicity is shown here →comes from the clas diagram



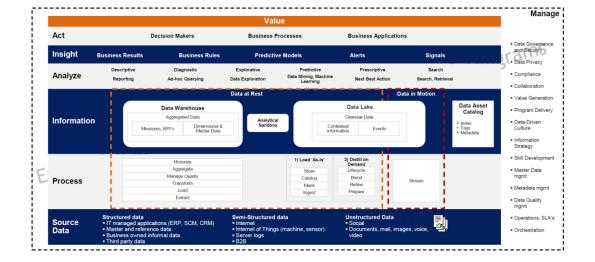
### Data Dissemination Diagram

### Example Data Dissemination Diagram





## Information Requirements





# Interoperability Requirements

### Interoperability

- Ability to share:
  - Information = data
  - Services

### Types:

- Business Interoperability = process
- Information Interoperability = information
- Technical Interoperability = services
- EAI
- Presentation = look & feel
- Information = share information
- Application = functionality / workflow
- Technical = methods / services

### Operation Model:

- Standardization = data
- Integration = processes



### Degree:

- 1. Unstructured Data Exchange
- 2. Structured Data Exchange
- 3. Seamless Sharing of Dara
- 4. Seamless Sharing of Information
- A. Formal Message
- B. Common Data
- C. Complete Data
- D. Real-Time Information

SBB vs COTS:

- COTS have own embedded business processes:
- changing embedded processes: work > benefit

## Interoperability Requirements

Phase B: Inter-stakeholder Information Interoperability Requirements
(Using degrees of information interoperability)

Stakeholders		А	B	С	D	E	F	G
А			2	3	2	3	3	3
	В	2		3	2	3	2	2
С		3	3	$\backslash$	2	2	2	3
	D	2	2	æ		3	3	3
	Е	4	4	2	3		3	3
	F	4	4	2	3	3		2
	G	2	2	3	3	3	3	
	<b>\</b>							

Phase C: Inter-system Interoperability Requirements								
	System A	System B	System C	System D	System E	System F	System G	
System A		2A	3D	2B	ЗA	ЗA	3B	
System B	2E		3F	2C	ЗA	2B	2C	
System C	3E	3F		2B	2A	2A	3B	
System D	2B	2B	2B		ЗA	ЗA	3B	
System E	4A	4B	2B	ЗA		3B	3B	
System F	4A	4A	2B	3B	ЗA		2D	
System G	2B	2B	ЗA	ЗA	3B	3B		

Stakeholder Requires from Stakeholder



## D: Technology Architecture

#### Objectives:

- Target Data Architecture in line with
  - Architecture Vision
  - Business Architecture
  - Data Architecture
  - Application Architecture
- Roadmap

#### Inputs:

- Arch:
  - Technology Principles
  - Data Architecture Requirements Specifications
  - Business, Data and Application Architecture Components

#### Outputs:

- Technology Components linked with Information Systems
- Technology Stack
- Environments & Locations
- Processing Load & Distribution
- Physical: network, HW, SW
- Draft Architecture Definition



#### Steps:

- 1. Select: model, viewpoints and tools
- 2. Baseline
- 3. Target
- 4. Gap Analysis
- 5. Candidate Roadmap
- 6. Resolve Impacts
- 7. Stakeholder Approval
- 8. Finalize Business Architecture
- 9. Update Architecture Definition document

## D: Technology Architecture

- 1. Select: model, viewpoints and tools
  - Technology Services Taxonomy
  - Physical inventory of deployed technology
    - Sizing & Costs
    - Capacity Planning
    - Governance
  - Configuration of components
  - Abilities:
    - Performance
    - Maintainability
    - Location & Latency
    - Availability
  - Emerging Technologies: drivers for change
  - Product Selection Process
    - Extend Product list: find existing products meeting requirements
  - Technology Stack Diagram
    - HW
    - OS
    - Infrastructure
    - Packaged Applications

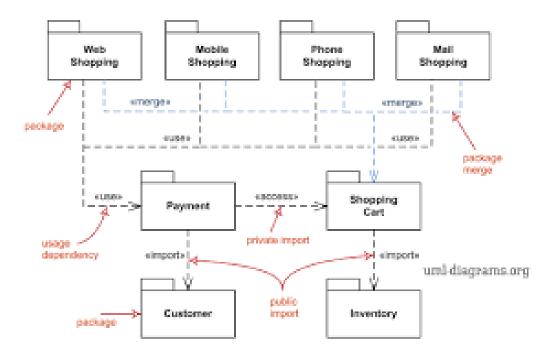
- Technology Service => Logical Technology Component => Physical Technology Component
  - Logical diagram: HW & SW
  - Physical diagram: communication infrastructure
- Repository:
  - Common Systems Architecture
- 2. Baseline

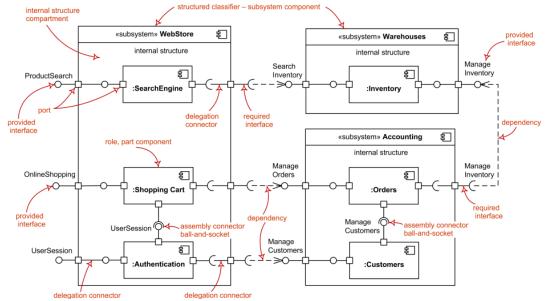
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- Technology Portfolio Catalog
- Technology Reference Model = TRM
- 3. Target
  - Architectural Building Blocks = ABB's
- 9. Update Architecture Definition document
  - Business Data Model
  - Logical Data Model
  - Data Management Process Model
  - Data Entity/Business Function Matrix
    - Which BU owns/stores data
  - Data Interoperability Requirements

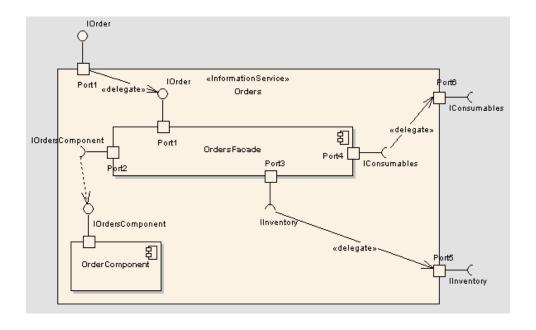
## Package Diagram







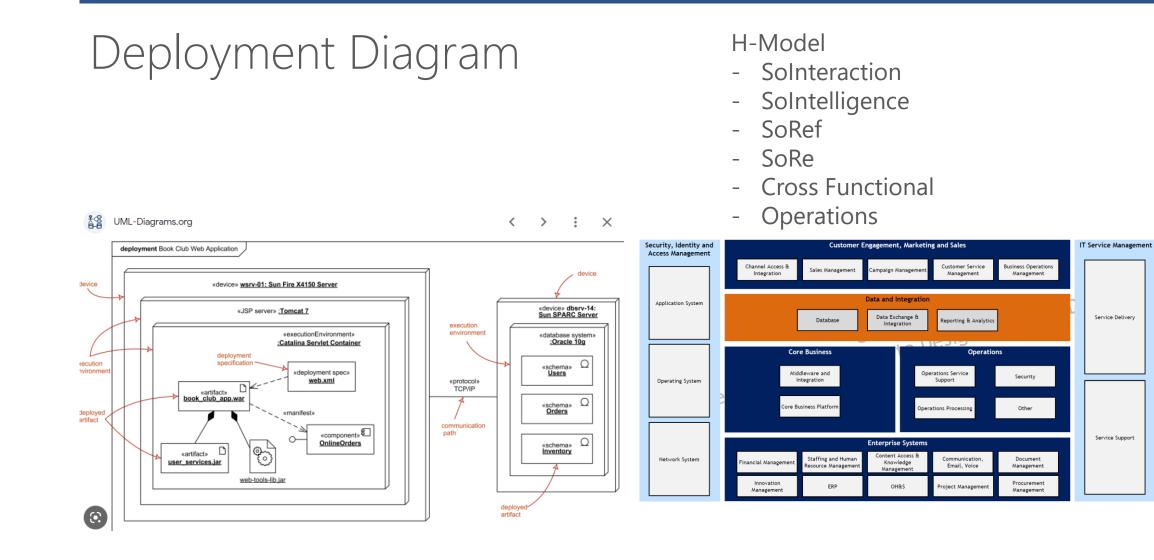
# Package Diagram



Part	«Information Service» Orders	
Port		See Note!
Interface		
Provided Interface	IOrder	See Note!
Required Interface	IConsumables	See Note!
Connector	< <dependency>&gt;</dependency>	Dependency = from required interface to provided interface

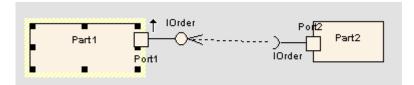
	< <delegate>&gt; («delegate» (Consumables)</delegate>	Delegate = from required (provided) interface to required (provided) interface
Component	Order Component	From the component toolbox

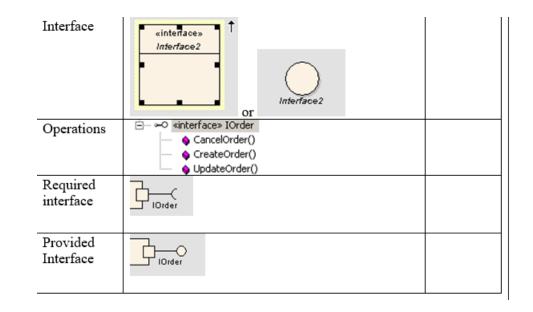






# Interface Diagram







## E: Opportunities & Solutions

### Objectives:

- Initial version of complete Architecture Roadmap
  - Combine Gap Analysis
    - Business (B)
    - Data/Apps (C)
    - Technology (D)
  - Incremental Approach
- Target Architecture
  - Select Solution Building Blocks
  - Using Architecture Building Blocks

### Inputs:

- Arch:
  - Architecture Vision
  - Draft Architecture Requirements Specification
  - Candidate Architecture Roadmap

### Outputs:

- Implementation Portfolio
- Work Package Portfolio
- Transition Architectures
- Implementation & Migration Strategy



### Steps:

- 1. Corporate Change Attributes
- 2. Business Constraints
- 3. Consolidate Gap Analysis
- 4. Consolidate Requirements
- 5. Consolidate Interoperability Requirements
- 6. Dependencies
- 7. Risk & Readiness
- 8. Migration and Implementation Strategy
- 9. Major Work Packages
- 10. Transition Architecture
- 11. Roadmap

## E: Opportunities & Solutions

- 1. Corporate Change Attributes
  - Implementation Factor Catalog: how to migration => in line with corporate culture
  - Repository of implementation & migration decisions
- 2. Business Constraints
- 3. Consolidate Gap Analysis
  - SBB to address the gaps and associated ABB
- 4. Consolidate Requirements
- 5. Consolidate Interoperability Requirements
  - Interoperability
    - SBB
    - COTS
    - 3<sup>rd</sup> Party
  - Transform & Translate between SBB's
- 6. Dependencies
- 7. Risk & Readiness



- 8. Migration and Implementation Strategy
  - Implementation Strategy
    - Greenfield
    - Revolutionary
    - Evolutionary
  - Implementation Methodology:
    - Quick Win
    - Achievable Targets
    - Value Chain Method
- 9. Major Work Packages
  - Gaps Solution Dependency Matrix
  - Current System Classification
    - Mainstream = part of the current system
    - Contain = soon to be replaced
    - Replace = to be replaced in the planning horizon
    - Transition
- 10. Transition Architecture
  - Baseline Architecture => Target Architecture N transition Architectures
- 11. Roadmap
  - Work Packages = set of actions
  - Planning = time frame

## F: Migration Planning

### Objectives:

- From
  - Implementation & Migration Strategy
  - Roadmap
- To
- Integration & Migration Plan
- Stakeholders understand Work Packages
  - Costs
  - Benefits = Value

### Inputs:

- Arch:
  - Business Planning
  - Portfolio/Program/Project Management
  - Change Requests for ongoing Projects/Programs

### Outputs:

VDB

- Project Charter
- Final Architecture Definition
- Final Architecture Requirements Specification

### Final Roadmap

4. Project Planning: priority & risk

Management FW Interactions

Business Value of Work Packages

Estimate Resources/Timings/Vehicle

- 5. Confirm Roadmap
- 6. Complete Plan

Steps:

1.

2.

3.

7. Complete ADM cycle & lessons Learned



## F: Migration Planning

### Steps:

- 1. Management FW Interactions
  - Coordination => Enterprise Continuum
    - Business Planning
    - EA
    - Product/Portfolio Management
    - Operations Management
- 2. Business Value of Work Packages
  - Criteria
    - Performance
    - ROI
    - Business Value
    - Critical Success Factors (CSF's)
    - Measure of Effectiveness (MOE)
    - Strategic Fit
  - Work Packages => Implementation Projects
- 3. Estimate Resources/Timings/Vehicle
  - Costs:



- Capital = create a capability
- Operations = operate a capability
- Maintenance = sustain a capability

- 4. Project Planning: priority & risk
  - Prioritization:
    - Business Value
    - Risk Mitigation
- 5. Confirm Roadmap
  - Transition Architecture State Evolution Table
- 6. Complete Plan
- 7. Complete ADM cycle & lessons Learned

## Migration Planning Techniques

- 5 Techniques:
- 1. Factor Catalog
- 2. Gaps-Solutions-Dependencies Matrix
- 3. Architecture Definition Increments Table
- 4. Transition Architecture State Evolution Table
- 5. Business Value Assessment

Implementation Factor Catalog									
Factor	Description	Deduction							
<name factor="" of=""></name>	<description factor="" of=""></description>	<impact migration="" on="" plan=""></impact>							
Change in Technology	Shut down the message centers, saving 700 personnel, and have them replaced by email.	<ul> <li>Need for personnel training, re-assignment</li> <li>Email has major personnel savings and should be given priority</li> </ul>							
Consolidation of Services									
Introduction of New Customer Service									

- 1. Factor Catalog =  $RI^2A^2D$
- Factor
- Description
- Deduction

Factors:

- Risks
- Issues
- Impacts
- Assumptions
- Actions
- Dependencies



## Migration Planning Techniques

- 2. Gaps-Solutions-Dependencies Matrix Architecture:
- Business
- Application
- Information

	Consolidated Gaps, Solutions, and Dependencies Matrix											
No.	Architecture	Gap	Potential Solutions	Dependencies								
1	Business	New Order Processing Process	Use COTS software tool process Implement custom solution	Drives applications (2)								
2	Application	New Order Processing Application	COTS software tool X Develop in-house									
3	Information	Consolidated Customer Information Base	Use COTS customer base Develop customer data mart									

## 3. Architecture Definition Increments Table

- Transition Architecture 1.. N
- Project 1.. N

	April 2018/2019	April 2019/2020	April 2020/2021	
Project	Transition Architecture 1: Preparation	Transition Architecture 2: Initial Operational Capability	Transition Architecture 3: Benefits	Comments
Enterprise e-Services Capability	Training and Business Process	e-Licensing Capability	e-Employment Benefits	
IT e-Forms	Design and Build			
IT e-Information Environment	Design and Build Information Environment	Client Common Data Web Content Design and Build	Enterprise Common Data Component Management Design and Build	

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## Migration Planning Techniques

### 4. Transition Architecture State Evolution Table

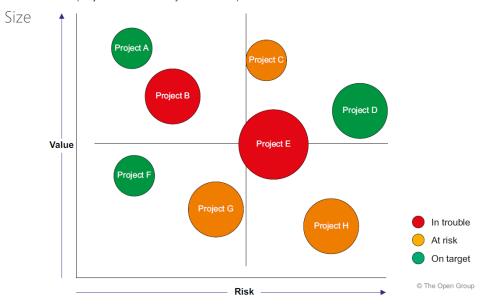
- Transition Architecture: 1 .. N
- Subdomain / Service: 1 .. N

### 5. Business Value Assessment

- Value:
  - Contribution to result
  - Strategic Alignment
  - Competitive Position
- Risk
  - Size
  - Complexity
- Project

•

#### (Project size indicated by size of circle.)



	Architectural State using the Technical Reference Model									
Sub-Domain	Service	Transition Transition Architecture 1 Architecture 2		Transition Architecture 3						
Infrastructure Applications	Information Exchange Services	Solution System A (replace)	Solution System B-1 (transition)	Solution System B-2 (new)						
	Data Management Services	Solution System D (retain)	Solution System D (retain)	Solution System D (retain)						



## G: Implementation Governance

## Objectives:

- Ensure Conformance:
  - Implementation Projects
  - Target Architecture
- Manage Architecture Change Requests Inputs:
- Arch:
  - Architecture Governance FW
  - Implementation Governance FW
  - Architecture Contract

Outputs:

- Architecture Contract
- Compliance Assessment
- CR
- Deployed Solutions



- Incremental Development Process
  - Deliver Value bit by bit
  - Phased Deployment Schedule

### Steps:

- 1. Scope & Priorities
- 2. Resource Identification
- 3. Solution Development Guidance
- 4. Compliance Reviews
- 5. IT & Business Operations Implementation
- 6. Post-Implementation Review

## G: Implementation Governance

- 1. Scope & Priorities
  - Gap-Analysis Report
- 2. Resource Identification
  - System Development Methods
  - EA Dev => Modelling Language => Solution Dev
- 3. Solution Development Guidance
  - Architecture Contract
- 4. Compliance Reviews
- 5. IT & Business Operations Implementation
  - Deploy solution
  - Publish Architectures in Repository
- 6. Post-Implementation Review



## Architecture Contract

- Solution Summary
  - Concepts Diagram = how problem is solved
  - Stakeholder catalog
  - Risk Catalog
  - Gap Catalog
- Specification Summary:
  - Implementation Strategy = approved
  - Architecture Specification
  - Control = risks
- Architecture Description Summary:
  - Business Architecture
  - Information Architecture
  - Application Architecture
  - Infrastructure Architecture
  - Security Architecture

VDR

## H: Implementation Governance

## Objectives:

- Ensure
  - Development Cycle Followed
  - Architecture Governance Executed
  - EA Capabilities meet Requirements

### Inputs

- Non-Arch
  - Request for Architecture Work
- Arch:
  - CR's
    - New Technology
    - Technology withdrawal
    - Cost Reduction
    - Standardization

### Steps:

- 1. Value Realization Process
- 2. Monitoring Tool Deployment
- 3. Risk Management
- 4. Architecture Change Management
- 5. Change Requirement to meet Performance Targets
- 6. Governance Process
- 7. Implement Change Process



## H: Implementation Governance

- 1. Value Realization Process
- 2. Monitoring Tool Deployment
  - Baseline Architecture Changes
    - Technology Change
    - Business Change
- 3. Risk Management
- 4. Architecture Change Management
  - Manage Changes
    - Internal Triggers = govern request
    - External Triggers:
      - New development in tech
      - Changes in business environment
- 5. Change Requirement to meet Performance Targets
  - Capacity Management
    - Growth / Decline of Business
    - Change in the operational Context
      - Scaling
      - Solution Architecture = different options based on capacity requirements

- 6. Governance Process
  - Change Management
    - Conditions triggering EA change after deployment
    - Conditions to trigger an ADM cycle
- 7. Implement Change Process
  - Changes:
    - Top-down = strategic
    - Bottom-Up = enhance capabilities
    - Feedback of current ADM iterations = experienced based
  - Architecture Board
    - Manage Change Requests
    - Type of Change:
      - Simplification
      - Incremental Change
      - Re-Architecting
    - CR or ADM Cycle?
      - Two or more stakeholder request
      - Two or more stakeholder impacted



## Architecture Requirements Management

### Objectives:

- Requirements
  - Identify & Manage
  - Use / Make Available
    - in ADM phases

### Inputs

- Non-Arch
  - Request for Architecture Work
- Arch:
- CR's
  - New Technology
  - Technology withdrawal
  - Cost Reduction
  - Standardization

### Outputs:

- Requirement Impact Assessment
- Architecture Requirement Specification

### Requirement:

- Changes
  - ADM = A => H CRUD on requirements
  - Requirement Management = Manage Approved Requirements
- Types:

.

- Functional
- Non-Functional
- Domain
- Source:
  - Business Scenarios

### Steps:

- 1. Document Requirements: Architecture Requirement Specifications in Requirements Repository
- 2. Baseline Requirements
- 3. Monitor Requirements
- 4. Identify New & Change Requirements + Conflict & Impact Identified
- 5. Assess impact of change: Current phase + previous phases & CR/ADM cycles
- 6. Implement Requirement/Change
- 7. Update Requirement Repository
- 8. Asses Gap Analysis: in baseline but not in target, not in baseline but in target = requirements not eliminated by accident

## Risk Management

### Risk Management:

- Trace Risks during Transformation
- Initial Level = before risk mitigation actions
- Residual = after risk mitigation actions
- 1. Classification
- 2. Identification
- 3. Assessment
- 4. Migration & Residual Risk
- 5. Risk Monitoring

Corporate Risk Impact Assessment											
		Frequency									
Effect	Frequent	Likely	Occasional	Seldom	Unlikely						
Catastrophic	E	E	Н	H	М						
Critical	E	Н	Н	М	L						
larginal	Н	М	M	L	L						
Vegligible	М	L	L	L	L						

### 1. Classification

- Type of impact => Type of Governance
  - Schedule impact = time
  - Budget impact = costs
- 2. Identification
  - CMM = Capability Maturity Models •
    - Risk of not achieving target state

### 3. Assessment

- Effect: •
  - Catastrophic
  - Critical
  - Marginal
  - Negligeable
- Frequency:
  - Frequent
  - Likely
  - Occasional
  - Seldom
  - Unlikely

• Extra High High

## Risk Management

- 4. Migration & Residual Risk
  - Mitigation = Action
  - Not mitigated = residual risk
- 5. Risk Monitoring

		Preliminary Risk				I	Residual Risl	k
Risk ID	Risk	Effect	Frequency	Impact	Mitigation	Effect	Frequency	Impact



Different Architecture Styles:

- Don't adapt TOGAF it is a FW
- Adapt using TOGAF's Metamodel
  - Notation
  - Modules
  - ViewPoint
  - Tools

ADM Iterations:

- 1 Project = 1 ADM Cycle
- Different Project = Different ADM Cycles
- 1 Project = Triggers ADM Cycle of Another Project

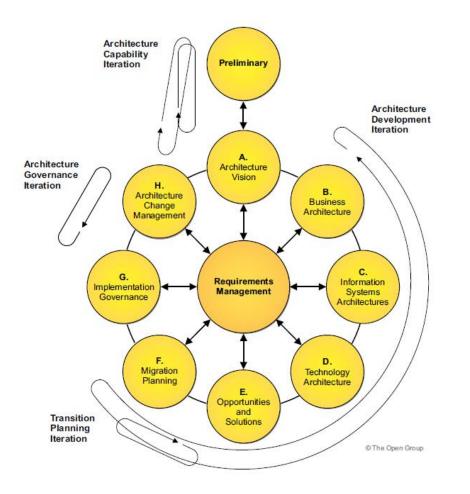
Projects:

- Concurrent ADM Phases
- Cycle of N phases
- Return to Update N-x phases

Changes:

- ADM Cycle
- Project CR





## ADM Iterations

- Architecture Capability
  - Preliminary <-> Visions <-> Change Management
- Architecture Development
  - Vision <-> Migration Planning
- Transitions Planning
  - Opportunities/Solutions <-> Migration Planning
- Architecture Governance:
  - Implementation Governance <->
     Change Management



Adapting ADM

#### ADM Iterations

#### Changes:

Identify

٠

- Business Strategy = retain alignment
  - Cycles:
    - Architecture Capability
    - Architecture Development (Baseline First)
- Portfolio Management Landscape = IT Portfolio performance
  - Cycles:
    - Architecture Capability
    - Architecture Development (Baseline First)
- Portfolio Management Project = decisions on project priority and funding
  - Cycles:
    - Transition Planning
    - Architecture Governance

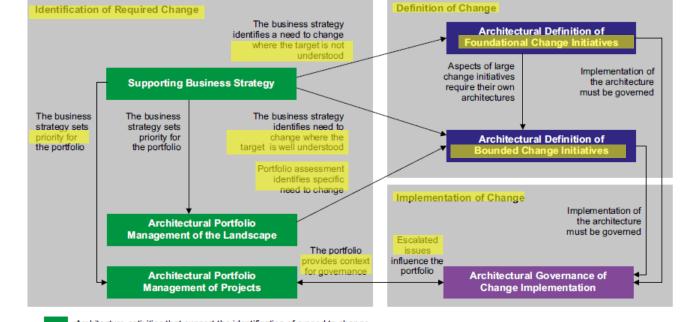
- Define:
  - Foundational Changes
    - Cycles

.

- Architecture Capability
- Architecture Development (Baseline First)
- Transition Planning
- Bounded Changes
  - Cycles
    - Architecture Capability
    - Architecture Development (Target First)
    - Transition Planning
- Implement
  - Governance of the Change Implementation

Cycles:

Architecture Governance



Architecture activities that support the identification of a need to change. Architecture activities that support the definition of how change can be achieved.

Architecture activities that govern the implementation of change.



> Target

-> Base Line First = if baseline is not agreed/understood

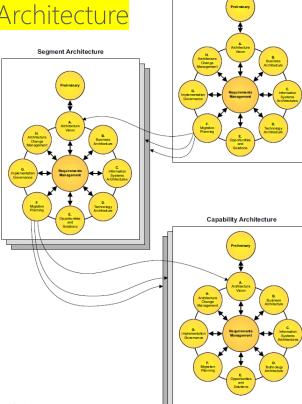
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<- Target First = if baseline is agreed/understood



## Iterations Between ADM-cycles:

- Strategic Architecture
- Segment Architecture
- Capability Architecture



Strategic Architecture

	Architecture Developmer			Transition Planning		Architecture Governance		
TOGAF Phase		Iteration 1	Iteration 2	Iteration n	Iteration 1	Iteration n	Iteration 1	Iteration n
Preliminary		Informal	Informal	Informal				Light
Architecture Vis	sion	Informal	Informal	Informal	Informal	Informal		Light
Business Architecture	Baseline	Core	Light	Core	Informal	Informal		Light
	Target	Informal	Core	Core	Informal	Informal		Light
Application	Baseline	Core	Light	Core	Informal	Informal		Light
Architecture	Target	Informal	Core	Core	Informal	Informal		Light
Data	Baseline	Core	Light	Core	Informal	Informal		Light
Architecture	Target	Informal	Core	Core	Informat	Informal		Light
Technology	Baseline	Core	Light	Core	Informal	Informal		Light
Architecture	Target	Informal	Core	Core	Informal	Informal		Light
Opportunities ar	nd Solutions	Light	Light	Light	Core	Core	Informal	Informal
Migration Planning		Light	Light	Light	Core	Core	Informal	Informal
Implementation	Governance				Informal	Informal	Core	Core
Change Manage	ement	Informal	Informal	Informal	Informal	Informal	Core	Core

# Core Light Informal

Core: primary focus activity for the iteration

Light: secondary focus activity for the iteration

Informal: potential activity for the iteration, not formally mentioned in the method

	Architecture Development				Transition Planning			ecture nance
TOGAF Phase		Iteration 1	Iteration 2	Iteration n	Iteration 1	Iteration n	Iteration 1	Iteration n
Preliminary		Informal	Informal	Informal				Light
Architecture Vis	ion	Informal	Informal	Informal	Informal	Informal		Light
Business	Baseline	Informal	Core	Core	Informal	Informal		Light
Architecture	Target	Core	Light	Core	Informal	Informal		Light
Application	Baseline	Informal	Core	Core	Informal	Informal		Light
Architecture	Target	Core	Light	Core	Informal	Informal		Light
Data	Baseline	Informal	Core	Core	Informal	Informal		Light
Architecture	Target	Core	Light	Core	Informal	Informal		Light
Technology	Baseline	Informal	Core	Core	Informal	Informal		Light
Architecture	Target	Core	Light	Core	Informal	Informal		Light
Opportunities and Solutions		Light	Light	Light	Core	Core	Informal	Informal
Migration Planning		Light	Light	Light	Core	Core	Informal	Informal
Implementation	Governance				Informal	Informal	Core	Core
Change Manage	ement	Informal	Informal	Informal	Informal	Informal	Core	Core

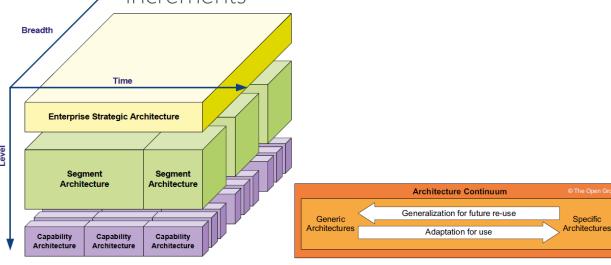
Core: primary focus activity for the iteration

Light: secondary focus activity for the iteration

Informal: potential activity for the iteration, not formally mentioned in the method

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- Strategic Architecture = corporate / executive level
- Segment Architecture = program/portfolio level
- Capability Architecture = capacity
   increment<sup>®</sup>



- Breath
- Depth
- Time
- Domain or Recency

Recency:

- State of the ADM process: draft/developed -> approved -> deployed
- EA ages of time



### Architecture Partitioning

- Different organizational units
- Different teams working together
- Re-uses requiring modular architecture

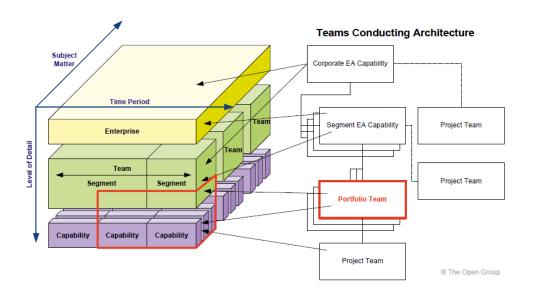
Partitioning based on:

- Breadth = subject matter
- Time = lifecycle
- Depth = level of detail
- Maturity/Volatility = speed of changes

Partitioning dependencies:

.

- Determine organizational structure
  - Team scope: Strategic / Segment / Capability
- Responsibilities of the architecture teams
  - Team organigram
- Relationships between architectures
  - Team roles/responsibilities



## Integration:

- Federated architecture:
  - Risk of fragmentation / Disjunctions
- Governance
  - Contenet Integration is compliance condition



# Practicing ADM

## Purpose of EA

#### Why?

- Effective Change: .
  - Improve .
  - Effective: govern .
    - Optimal Path ٠
    - . Control Activities
  - . Scope:
    - . Gaps
    - Future State ٠
- Do: .
- Right things ٠
- Correct level of detail .
- For the best time to market .

#### What?

- Execution Path = most effective path to realizer an enterprise strategy ٠
- Chang cycle: plan -> design -> deploy -> deliver .
- Understanding: .
  - Enterprise context of change •
  - Scope of change ٠
  - Value change will bring .

#### Landscape:

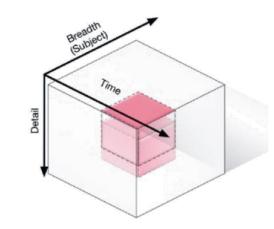
- ٠ EA project
- Focus = avoid delusion of EA energy .
  - Everywhere .
  - Every conversation .

#### Purpose:

- Strategy •
  - Context .
  - Vision .
  - Target State ٠
- Portfolio .
  - Work packages ٠
  - ٠ Viability
  - Budget ٠
  - Confidence in delivery ٠
- Project .
  - Dependencies ٠
  - . Balance Options
  - Finalization Scope/Budget .
  - Delivery Governance ٠
- Solution Delivery .
  - ٠ Align principles
  - ٠ Guide delivery
  - . Realize solution

#### How?

- Guide change •
- Like-to-Like comparison •





## Purpose of EA

Architecture Contract:

- Project Context = fit in the roadmap
- Scope = work packages & gaps
- Conformance = specifications & controls to asses the result

Architecture Specification:

- Exclusionary = describes what is forbidden
- Reasonable = assess via requirements

Non Compliance:

- Enforce archiecture
- Change architecture
- Grand relief = exception

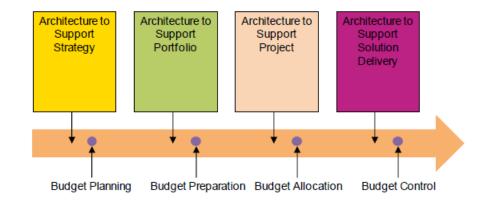
## Business Cycle

## Budget Cycle:

- Levels:
  - Strategic
  - Portfolio
  - Project
  - Solution Architecture
- Budget:
  - Planning
    - Change requires budget to be spent on new initiatives
  - Preparation
    - Priority = must be done / can be done / should be postponed
    - Funding
    - Forecasting = Y+1, ... , +n budgets
  - Allocation
    - No gold plating = target is important
    - Value generating = If bottom-up what is the value?
      - No gap => no change
  - Control

VDI

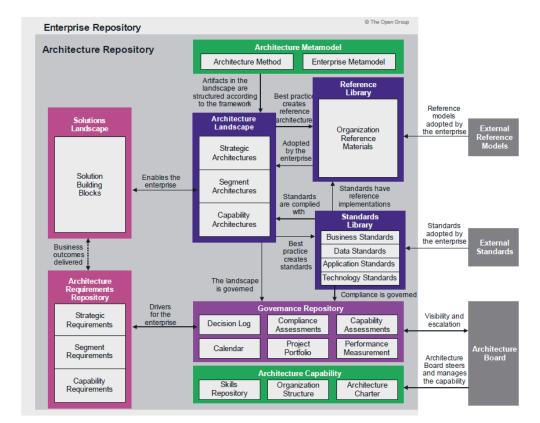
• Value tracing & realization



## EA Repository

EA Repository:

- Metamodel
- Landscape: Architecture & Solution
  - EA Landscape
    - Baseline = current
    - Transition
    - Candidate
    - Target
- Reference Library
  - Model / Architectures / Patterns
  - APQC = American Productivity & Quality Center: Process Classification FW
  - IT4IT
- Standards Library
  - What = common
  - How = implementation
  - Tracing = services where standard was brought to live
- Requirements Repository
  - Requirement differ: purpose & level of details
  - Portfolio/Project Requirements: captured as scores
  - Enterprise differentiator = Long lived requirement
  - Types: Functional / Non-Functional / Domain
  - Time dependent = priority & importance
- Governance Repository:
  - Compliance assessment:
    - Scope = identify what gaps to be filled
    - Implementation = how gaps were filled
      - Value realized?
      - How good specifications where followed?



### Fit for Purpose:

- Enough Detail
- Usage: Sketches vs Models
  - EA = Models
  - Communication = Sketches
- Repository is not only a CMDB as many changes are not architectueal

VDB

## EA to Support Strategy

- Understand Context
  - Roadmap
  - Goals & Objectives
  - Operating Model
  - Governance Model
  - Risk Model
  - EA Capability Model
  - EA Process Model
- Assessment:
  - Operating Levels
  - Operational Challenges
  - Gaps between current and target
  - Stakeholder Matrix
  - Value Proposition
- Target State:
  - { gap } = work package
  - Capabilities
  - Organization Model
  - Operation Model

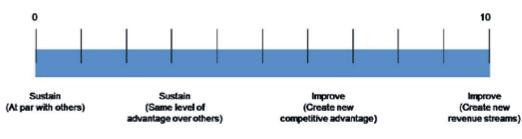


### Tools:

- Strategy Map:
  - Financial
  - Customer
  - Internal Processes
  - Growth Perspective
- Porter 5 forces:
  - Threat of new entrants
  - Bargaining power of buyers
  - Threat of substitute products
  - Bargaining power of supplier
  - Existing Competition

## EA to Support Portfolio

- Understand Context
  - Olympic Minimum
  - Keep Advantage
  - Extend advantage = new differentiates
  - New Markets



- Group Work Packages in Themes:
  - Themes = lens of EA
  - POC's are not part of EA
  - Current roadmap
  - In flight projects
- Balance Opportunity and Viability
- Run Up a Budget

٠

- Drive Confidence of Delivery
  - Estimates and Variance Control: How & How Much

### Tools:

- Work Package Grouping
  - Importance
  - Timeline Impact
  - Effort

.

Magnitude of Investment

 Portfolio Theme	Work Package Name	Work Package Required	Importance	Impact Realization Timeline	Effort Required	Magnitude of Investment

• Ideas form the Wild:

.

- Aligned with
  - Vision
  - Mission
  - Strategy
- Challenges the status-quo?
- Stakeholders?



## EA to Support Projects

- Ascertain Dependencies
  - Recency = impact of other // projects
    - Neighboring projects
      - How much room before they overlap
      - State of the project: approved => in development
    - Overlap required descoping
  - Readiness:
    - Enterprise = absorb solution
    - Solution provider = deliver solution => capabilities
  - Stakeholders:
    - No project specific stakeholders
    - If need be project specific concerns

- Balance Options and Suppliers
  - ABB's
  - SBB's
  - Consistent reconnaissance to avoid disaster
  - Specifications to prevent overlap = constraint during solution delivery
- Finalize Scope and Budget
- Prepare Solution Delivery Governance



## EA to Solution Delivery

- Align Implementation
  - Change triggers midst implementation
  - Solution Architecture defines conditions when changes are acceptable
  - 3<sup>rd</sup> party developed => In house validated/accepted/integrated
  - Evaluation:
    - Points of failure
    - Feasibility
    - Scalability
- Guide Delivery
  - Continuously Update/Analyze
    - Update EA Landscape
    - Update EA Repository
    - Analyze Impact on Superior Architecture
  - Integration
    - Current Architecture
    - Future Architecture
  - Core information retained in-house
  - Solution Families = Packaged Products
    - Impact analysis required

- Realizing the Solution
  - Asses Changes to EA roadmap
  - Create backlog of Architecture Work
    - Sub-Optimal Delivery can be intentional = addressed in future Architecture work
  - Warranty period after production
  - Gap analysis: baseline vs. realized architecture



## Using EA

### Jumping to H - Implementation Governance:

- Effective change
  - Bias to action
  - Predictable change incl. innovation/creativity
- Guide for change requires:
  - Timely changes
  - Targeted changes
- Failures:
  - No Purpose
    - Architecture = Strategy
    - Solution Implementation = Delivery
  - No Business Cycles:
    - Be at the table: advice not to drive pet projects
    - Working ahead of planning cycles
      - FYE 2Q: Provide input to decision takers
      - FYE 1Q: negotiation between stakeholders and decisions takers
      - FYE: clarity on the plant
  - Architecture after Decision
    - Only validate decision = pointless as decision was already made
    - Creates conflicts

- Not doing Architecture:
  - Multiple roles beyond architecture
  - Implicit architecture:
    - No explicit stakeholder approval
    - Implicit on preferences:
      - Mission
      - Vision
      - Vue proposition
      - Objectives
- Unplanned Changes:
  - More risk, less confidence
  - Risk mitigation required
  - Connect the dots:
    - Strategy
    - Benefit
  - Focus on:
    - Enterprise benefits
    - Not project benefits
  - Agile:
    - Agile increments = micro-iterations of ADM
    - Scrum Master = Practioner in the role of stakeholder agent

## EA Special Cases

### Agile:

- Blurs Implementation & Architecture
- TOGAL put Agile in phase G: Governance
- Constraints for project delivery team

### Domain:

- Domain FITS INTO = part of EA
- EA aligned to = FITS WITH domain

### Incident Response:

- Risks:
  - Uncertainty of objectives
  - Risk appetite
  - Risk tolerance

### Complex Roadmaps:

- Complexity:
  - External Effects
  - External Collaboration
  - Maturity of Teams
  - Availability
    - Solution
    - End-of-live products
  - Internal grouping
- Roadmap Grouping
  - Grouping
    - Segment
    - Portfolio
    - Geography
  - N concurrent enterprise goals
  - N baselines
- Comparing Architectures
  - 1 Architecture Project = 1 Baseline
  - Standard Reference Architecture = compare N projects
    - Impact analysis
    - Year over Year changes



## Governance

### Governance of Business Cycle

- C-Level EA Request
  - Explicit Request
  - Implicit EA in current planning cycle
  - Retro-Active: not optimal
- Normal Business cycle:
  - Normal planning cycle
  - Explicit EA for next planning cycle
  - Pro-active:
    - Prepare Data Packages
    - Do budget planning
  - Budget control:
    - Earned Value Analysis
    - Avoid as other role for EA Architect:
      - Since they are involved in realization = Less focus during planning
  - Work in the wild triggers:
    - Review
    - Trade-Off Analysis
    - Governance

## VDB

### Architecture Governance:

- What? Why?
  - Target Architecture
  - Scope Changes
    - Architecture Contract
    - Architecture Requirements Specifications
- Who?
  - Roles, Duties, Decision Rights
    - Stakeholder
    - Stakeholder Agent
    - SME
    - Implementer
    - Architect
    - Auditor
- Compliance:
  - Constraints: confirmed /violated
  - Value: delivered / failed to deliver
  - Gap: filled / left open

## Governance

## Governance of Architectuer

- Target Checklist
  - Stakeholders identified
  - Superior Architecture = context
  - SME's agree on baseline
  - Views produced for stakeholders
  - Concerns of stakeholders in views
  - Stakeholders understand
    - Value
    - Work necessary = WBS
    - Limitations of Confidence
  - Views are approved

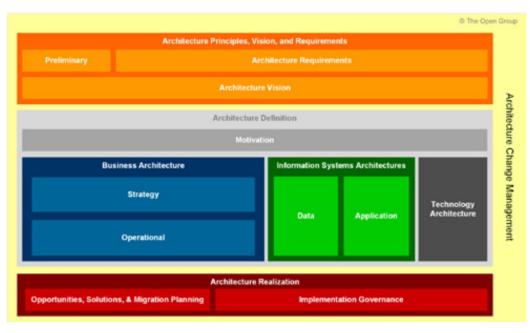
- Change Checklist:
  - Understand Target Architecture
     Governance & Constraints
  - SME's agree on facts
  - SME's agree on recommendations
  - Views reflects impact assessment
  - Stakeholder understand impact on confidence
  - Stakeholder understand impact on value
  - Approve solutions:
    - Enforce
    - Grand relief
    - Change

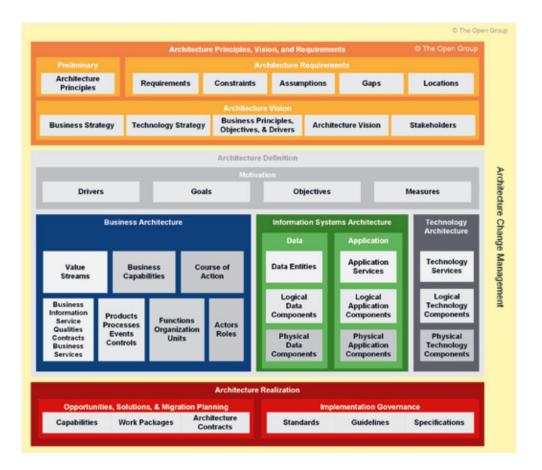


# Content FW & Enterprise Meta-Model

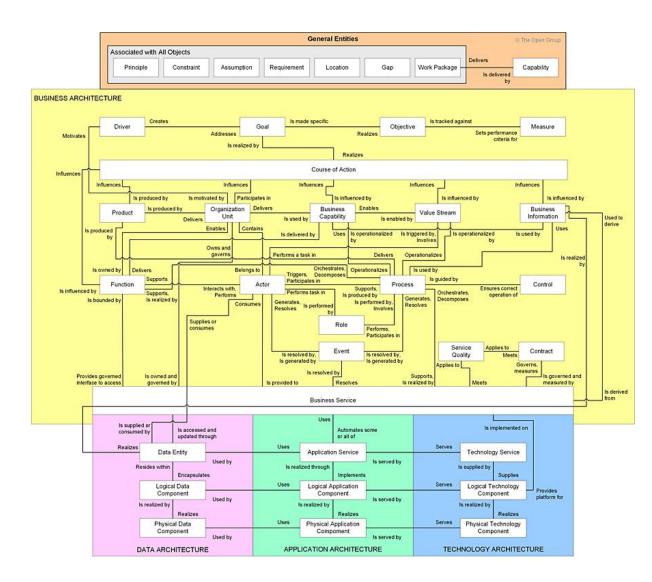
### Content Framework

- Content Framework:
  - Categorization FW for Architecture Description
- Enterprise Metamodel:
  - Entities and relationship that describe the Enterprise
  - Basis for an organization specific metamodel





### Enterprise Meta-Model



- Actor
- Application Service
- Assumption
- Business Capability
- Business Information
- Business Service = unique business behavior
- Capability
- Constraint
- Contract = consumer/provider functional/nonfunctional
- Control
- Course of Action = direction/focus
- Data Entity

## Definitions

- Driver = external condition motivating the organization to define its goals
- Event
- Function = set of business behaviors for a set of criteria
- Gap
- Goal = high-level intent or direction
- Location
- Logical Application Component
- Logical Data Component
- Logical Technical Component
- Measure
- Objective

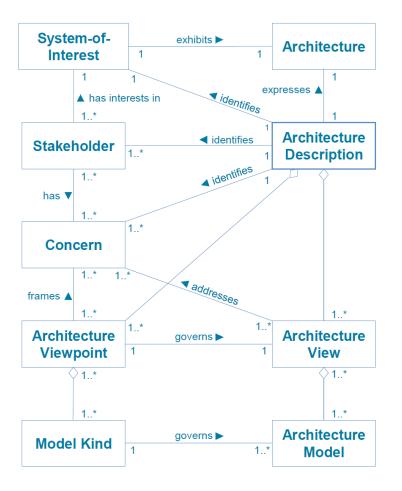
VDB

• Organization Unit



- Physical Data Component
- Physical Technical Component
- Principle
- Process
- Product
- Requirement
- Role
- Service Quality
- Technology Service = enabling infrastructure for delivery of applications
- Value Stream
- Work Package

### Artifacts





Terms:

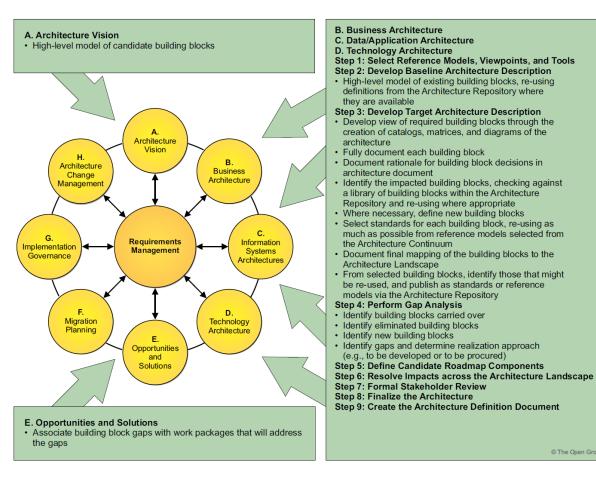
- Environment = context determining the setting and circumstances
- System = combination of interacting elements to achieve a purpose
- Architecture = fundamental concepts or properties of a system
- Architecture Description = work product that expresses architectures, views or models
- Stakeholders
- Concerns
- Architecture View
- Architecture Model
- Architecture Viewpoint
- Model Kind

### Artifacts – ADM Phases

Preliminary	Business A	Architecture	Data Architecture	Application Architecture	Technology Architecture
Catalogs	Cata	logs	Catalogs	Catalogs	Catalogs
Principles Catalog	Organization/Actor Catalog	Contract/Measure Catalog	Data Entity/Data Component Catalog	Application Portfolio Catalog	Technology Standards Catalog
Architecture Vision	Driver/Goal/Objective Catalog	Business Capabilities Catalog		Interface Catalog	Technology Portfolio Catalog
Catalogs	Role Catalog	Value Stream Catalog	Matrices	Matrices	Matrices
Stakeholder Catalog	Business Service/Function Catalog	Value Stream Stages Catalog	Data Entity/Business Function Matrix	Application/Organization Matrix	Application/Technology Matrix
Diagrams	Location Catalog	Business Glossary Catalog	Application/Data Matrix	Role/Application Matrix	
Value Chain Diagram	Process/Event/Control Product Catalog			Application/Function Matrix	
Solution Concept Diagram		rices		Application Interaction Matrix	
Business Model Diagram	Business Interaction Matrix	Strategy/Capability Matrix	Diagrams	Diagrams	Diagrams
Business Capability Map	Actor/Role Matrix	Capability/Organization Matrix	Conceptual Data Diagram	Application Communication Diagram	Environments and Locations Diagram
Value Stream Map	Value Stream/Capability Matrix		Logical Data Diagram	Application and User Location Diagram	Platform Decomposition Diagram
Opportunities and Solutions	Diag	rams	Data Dissemination Diagram	Application Use-Case Diagram	Processing Diagram
Diagrams	Business Footprint Diagram	Process Flow Diagram	Data Security Diagram	Enterprise Manageability Diagram	Networked Computing/ Hardware Diagram
Project Context Diagram	Business Service/Information Diagram	Business Event Diagram	Data Migration Diagram	Process/Application Realization Diagram	Network and Communications Diagram
Benefits Diagram	Functional Decomposition Diagram	Business Capability Map	Data Lifecycle Diagram	Software Engineering Diagram	
Requirements Management	Product Lifecycle Diagram	Value Stream Map		Application Migration Diagram	
Catalogs Requirements Catalog	Goal/Objective/Business Service Diagram	Organization Map		Software Distribution Diagram	
	Business Use-Case Diagram	Information Map			
	Organization Decomposition Diagram				© The Open Group

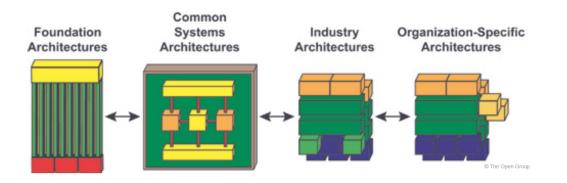


### Building Blocks



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### Architecture Continuum



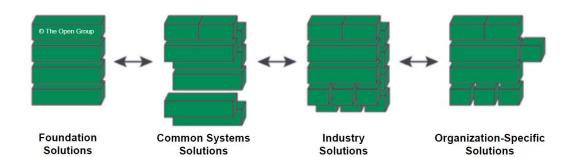
- Foundation Architecture
  - Generic components
  - Principles
  - Guidelines
  - Relationships
- Common Systems Architecture
  - Selection of Services and integrations form Foundation Architecture
  - Building solution across multiple domains = Cross Cutting
  - EG:
    - Security Architecture
    - Operations Architecture
    - Management Architecture
- Industry Architectures:

•

- Integration Common Components with Industry Specific Components
- EG:
  - Vertical Industry business capabilities/processes
- Organization Specific Architecture
  - For a specific enterprise or collection of enterprises



### Solution Continuum



- Foundation Solutions
  - Concepts
  - Tools
  - Products
  - Services
  - Solution Components
  - EG:
    - Programming Languages
    - OS's
    - Data Languages
- Common Systems Solutions
  - Set of products & services
- Industry Solutions:
  - Re-usable packages
  - EG:
    - DB Schema for a Business
- Organization Specific Solutions
  - Solutions providing specific business capabilities



## Standards Library

Standards:

- Source
  - Legal & Regulatory Obligations
  - Industry Standards
  - Organizational Standards
- Classification
  - Business Standards
  - Data Standards
  - Application Standards
  - Technology Standards



# EA Capabilities & Governance

### Capabilities

Architecture Capabilities:

- Not a separate phase in ADM
- Developed like any other Enterprise Capability
- Not one-off activity but ongoing effort



### Governance

#### Architecture Governance:

- The system by which enterprise are directed and controlled Governance Hierarchy:
- Enterprise Governance
- Technology Governance
  - How technology is used to create and deliver goods and services
  - Manage Intangibles: data
- IT Governance
  - How IT resources and data are used for enterprise strategy
  - Managing IT performance
  - Often part of Technology Governance
  - IT Controls: COBIT
- Architecture Governance
  - How Architecture is created and deployed in compliance with standards and regulations
  - Managing Architecture performance
  - Ensure Accountability



#### Governance Characteristics

- Discipline = process & procedures
- Transparency = open for inspection
- Independence = avoid conflicts of interest
- Accountability = accountable for actions
- Responsibility = responsible to organizations and stakeholders
- Fairness = avoid unfair advantage



### Architecture Governance Framework

#### Process

- Policy Management & Take-On = integration of new policies
- Compliance = assessment against metrics, requirements and standards
- Dispensation = a waiver to reject a compliance assessment for the lifespan of the waiver
- Monitoring & Reporting = operational and service performance management
- Business Control = compliance with business policies
- Environmental Management = meta-management of the Governance FW => managing the Governance FW processes and repository

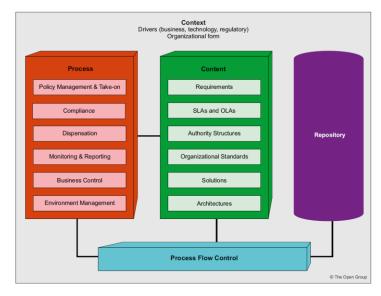
#### Organizational Structure:

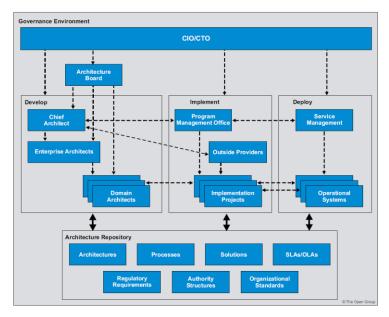
- Global Governance Board
- Architecture Board
- Architecture Management:
  - Development
  - Implement
  - Deploy
- Architecture Repository

Effective Governance:

- Cross-Organizational Architecture Board
- Set of Architecture Principles => Architecture Contract
- An Architecture Compliance Strategy







## Architecture Governance Framework

Responsibilities / Activities

- Decisions-making
- Consistency & Compliance
- Dispute Resolution
- Architecture Maturity
- Acceptance & Divergence (Waivers)
- Escalation

#### Size:

• 4-5 < 10

Drivers:

- Organizational Change: M&A, Expansion, Restructuring
- Technology / Platform Change
- Process Changes / Improvement Plans



### Architecture Contracts

#### Architecture Contract:

- Agreement between sponsors and development partners on deliverables, quality and fit-for-purpose of Architecture
- Based:
  - Continuous Monitoring
  - Adhering Principles
  - Risk Identification
  - Processes & Practices
  - Governance
- In ADM Phases:
  - Phase A:
    - State of Architecture Work
    - Between Sponsor & EA
  - Phase B->D:
    - Development Architecture Domains
    - Between Architecture Design & Development Partners
  - Phase G:
    - Implementation Governance of Enterprise Architecture for Implementation Teams
    - Development Partners & Project Management
  - Phase F:

.

- Migration Plan
- Between Architecture Function & Business Stakeholders

#### Contracts:

- SAW = Statement of Architecture Work
- Architecture Design & Development Partners
  - Context
  - Scope
  - Process & Roles
  - Principles & Requirements
  - Deliverables
  - Conformance & Metrics
  - Workplan: Phases & Time
- Architecture Function & Business Stakeholders
  - Context
  - Scope
  - Strategic Requirements
  - Adopters (who will receive architecture)
  - Deliverables
  - SLA's & Business Metrics
  - Workplan: Time Windows

### Architecture Compliance

#### Architecture Specification

#### © The Open Group

**Irrelevant:** The implementation has no features in common with the architecture specification (so the question of conformance does not arise).

#### Consistent:

The implementation has some features in common with the architecture specification, and those common features are implemented in accordance with the specification. However, some features in the architecture specification are not implemented, and the implementation has other features that are not covered by the specification.

#### Compliant:

Some features in the architecture specification are not implemented, but all features implemented are covered by the specification, and in accordance with it.

#### Conformant:

All the features in the architecture specification are implemented in accordance with the specification, but some more features are implemented that are not in accordance with it.

#### Fully Conformant:

There is full correspondence between architecture specification and implementation. All specified features are implemented in accordance with the specification, and there are no features implemented that are not covered by the specification.

#### Non-conformant:

Any of the above in which some features in the architecture specification are implemented not in accordance with the specification.

#### Compliance:

- Supports stated Strategy
- Adheres to stated Standards
- Provides stated functionality
- Adheres to stated Principles

#### Purpose:

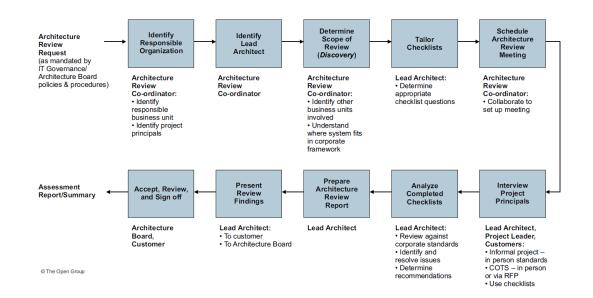
- Catch deviations early
- Identify where standards require updates
- Opportunities
  - Extract standards form specific implementation
  - New technologies

#### Timing:

- Development of Architecture
- Implementation of Architecture
- Changing Architecture



### Architecture Compliance



- 1. Request Review
- 2. Identify responsible for Architecture
- 3. Determine Scope of Review
- 4. Tailor Checklist
- 5. Schedule Review
- 6. Interview Project Principles
  - Internal: in-person
  - External: RFP checklist
- 7. Analyze Completed Checklists
- 8. Prepare Review Report
- 9. Present Review Findings:
  - Customer
  - Architecture Board
- 10. Accept Review & Sign-Off



## Architecture Compliance

Checklists:

- HW/OS Checklist
- Software Services Checklist
- Application Checklist
  - Infrastructure
  - Business
  - Application Integration
- Information Management Checklist
  - Data Values
  - Data Definition
  - Data Security
  - Data Management

- Security Checklist
  - Awareness
  - Authentication/Authorization
  - Sensitive Data Protection
  - Auditing
- System Management Checklist
- System Engineering Checklist
  - HW
  - Clients
  - Servers
  - COTS
- Methods & Tools Checklist

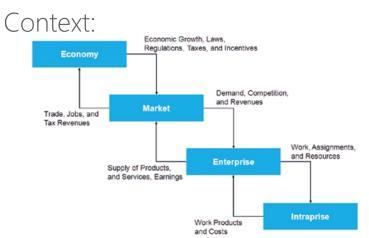


# EA Leadership

## Introduction

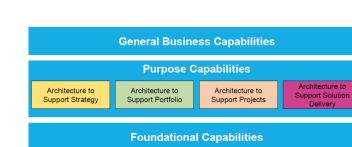
#### Definitions

- Capability:
  - Do something that leads to enhanced outcome
- Enterprise
  - Boundary of EA Capability
- EA Capability
  - The ability to develop, maintain and evolve EA
  - Part of ADM Preliminary Phase
- EA Leader
  - Person that establishes or evolves EA Capabilities



### Capabilities:

- Strategy
- Portfolio
- Project



• Solution Delivery



## Context for EA

Enterprise:

- Boundary
- Purpose: private, public, social
- Strategic statement: how / where to compete
- Business Model
  - How to stay current in environment & economy
  - Value
  - Channels
  - Activities
- Operating Model
  - How to execute core functions
- Operating Environment:
  - Standards



Regulations

### Operating Model:

High High	<b>Coordination</b> Unique business units have a need to know each other's transactions. For example, different products are provided to the same customers like credit cards and home/auto loans or life, home, and automobile insurance.	<b>Unification</b> Single business with global process standards and data access. For example, managing events or outsourced services globally and across clients.
Low	<b>Diversification</b> Independent business units with different customers and expertise. For example, lodging services provided on land and cruises have very little commonality in customer base and internal employee subject matter expertise, but lessons can be learned to stay efficient across all business units.	<b>Replication</b> Independent but similar business units. For example, geographically distributed set of factories operate the same way to assure quality to customers, irrespective of where the product was made.
	Low	High

Business Process Standardization

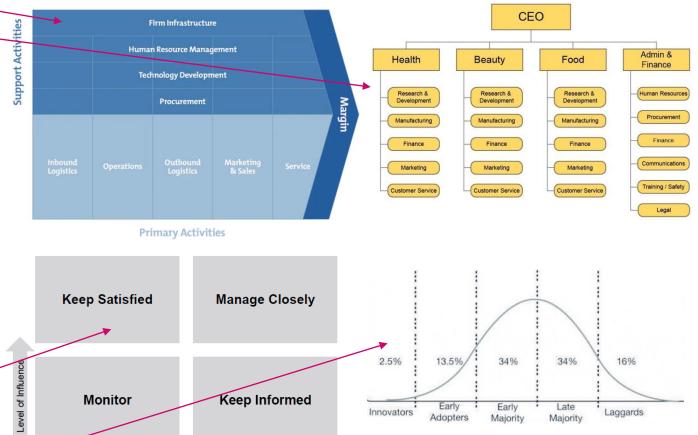
## Context for EA

- Organizational Model:
  - Functional Organizational Mode
  - Product Based Organizational Model-٠
  - Project Based Matrix Structure
- Econometric Model
  - Accounting ٠
    - OPEX CAPEX COGS •
    - Customer Intimacy / Product Leadersł • / Operational Excellence
  - Forecasting
    - Planning Horizon ٠
  - Planning & Allocation ٠
    - EA Principles: decisions => value • generation
- Decision Model:
  - Power/Impact Model

Innovation Adoption Model

### Operating Model:

Level of Impact



Early

Adopters

Innovators

Early

Majority

Late

Majority

Laggards

Bisk Management Model:

## Business Objectives for EA

#### Expectations

- Goals?
- Where used?
- Do the right thing?
- How is success measured?

#### Depth & Breadth:

- Strategy
- Portfolio
- Project
- Solution Deliver

#### Organizational Model:

- EA support decision-making
- EA supports governance needs
- EA interacts with correct decision-maker

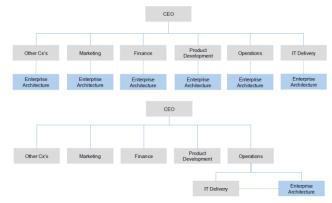
Alignment EA Capability Team – Organizational Model:

- Function Centric EA
- IT-Centric EA
- Strategy-Centric EA

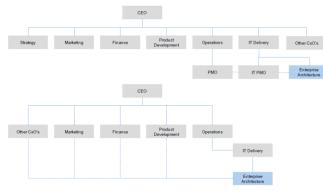
#### Bottom-Up Objectives:

- Foundation for Future Scaling
- Clarity
- Risk Reduction









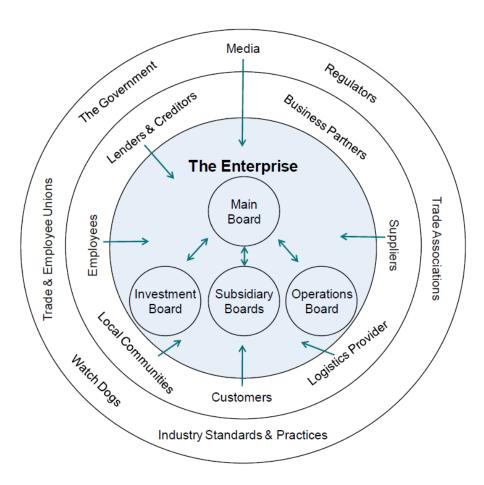






## Structure for EA

- Governance
  - Approval Checklist
  - Non-Compliance Checklist
- Reporting FW:
  - Enterprise Interactions => Potential Reporting
- Risk Management Approach
  - Risk Appetite/Tolerance
  - Assessment
  - Treatment
- Alignment With other FW's
- Customization
  - Content
  - Meta-Model





### Content & Metamodel for EA

- Content
  - Maintain the information or link the information
- Metamodel
  - Maintain the taxonomy
- Focus:
  - Minimize the information required to execute EA Capability = effort vs. result
  - Questions the business wants to be answered = minimum required information for viewpoints
  - Standardize information
  - Automation information gathering

#### Content Standardization Impact

How Repeatability Influences Standardization of the EA Content Framework									
EA to Support	Process	Analysis	Presentation						
Strategy	Low	Low	Low						
Portfolio	Medium	Medium	Medium						
Project	High	High	Very High						
Solution Delivery	Very High	High	Very High						

#### Distribution/Federation/Analysis Impact:

How the EA Team Organization Model and Analysis Needs Influence EA Repository Standardization										
EA to Support	Impact of Geographic Distribution	Impact of Federated Organization Model	Impact of Level of Complex Analysis							
Strategy	Limited Impact	Very Limited Impact	Very High							
Portfolio	Some Impact	Significant Impact	Very High							
Project	Significant Impact	Significant Impact	Low							
Solution Delivery	Significant Impact	Massive Impact	Limited							



## Teams in EA

#### Alignment:

- Function Centric EA
- IT-Centric EA
- Strategy-Centric EA

#### EA Capabilities:

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- Roles & Responsibilities
- Skills
- Performance Evaluation
  - Hard to measure the performance in creating model, documents and visualizations: measure person
    - Identify Alternatives

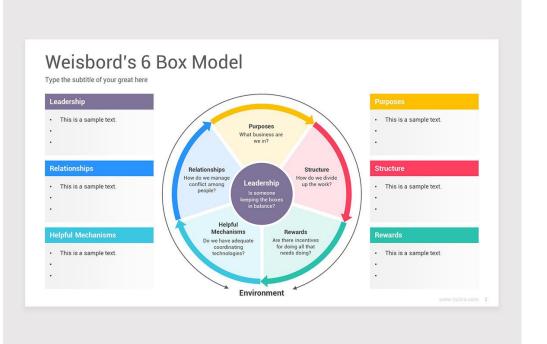
Internal & External Recruited

- Tailor
- Trade-Off Analysis & Impact Analysis
- Planning
- Execute
- Capacity
  - Don't underestimate the experience to the deliver a roadmap: maturity of the organization
- VDB

**General Business Capabilities** Performance Organization HR Management Leadership etc. Management Model **Purpose Capabilities** Architecture to Support Architecture to Architecture to Architecture to Support Strategy Solution Delivery Support Portfolio Support Projects Develop Architecture Develop Architecture Develop Architecture (Consume Superior Develop Architecture (Consume Superior (Consume Superior Architecture) Architecture) Architecture) Govern Subordinate Govern Subordinate Govern Projects & Design Support Procurement Architecture Architecture

Foundational Capabilities									
Architecture Contents (Model)	Architecture Contents (Template & Repository)		Governance		Process Integration		EA Techniques (Stakeholder, Risk, Trade-off, etc.)		





#### SFIA 8 Summary Chart

Standing planning     ITSP     ISCO       Information systement     ISCO       Information systement     ISCO       Information systement     ISCO       Information systement     ISCO       Energing technology combining     EMEG       Benard management     ISCO       Information systement     ISCO       Information systement     ISCO       Benard management     ISCO       Information assegment     QUAG       Information assegment     QUAG       Combustory     CISL       Social addres     I       Information assegment     QUAG       Combustory     CISL       Social addres     I	Strategy and planning	1	23	
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BPRE

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Systems development		1	2	3	4	5	6	7
Product management	PROD		1	3	4	5	6	<i>.</i>
Systems development management	DLMG			2		5	6	7
Systems and software life cycle engineering	SLEN				4	5	6	2
Systems design	DESN			3	4	5	6	-
Software design	SWDN		2	3	4	5	6	
Network design	NTDS		4	3	4	5	6	
Hardware design	HWDE		2	3	4	5	6	
Programming/software development	SINT			3	4	5	6	
Systems integration and build	TEST	-	2	3			×.	
Testing		1	2		4	5	6	
Software configuration	PORT			3	4	5	6	
Real-time/embedded systems development	RESD		2	3	4	5	6	
Safety engineering	SFEN			3	4	5	6	
Safety assessment	SFAS		-		4	5	6	
Radio frequency engineering	RFEN		2	3	4	5	6	
Animation development	ADEV			3	4	5	6	
Data and analytics		1	2	3	4	5	6	7
Data management	DATM				4	5	6	
Data modelling and design	DTAN		2	3	4	5		
Database design	DRDS		-	3	4	5		
Data engineering	DENG		2	3	4	5	6	
Database administration	DBAD		2	3	4	5		
Data science	DATS		2	3	4	5	6	-
Machine learning	MLNG		2	3	4	5	6	1
Business intelligence	RINT		2	3	4	5	0	
Data visualisation	VISL		2	3		5		
Data visualisation	VISL			3	4	5		
User experience		1	2	3	4	5	6	7
User research	URCH			3	4	5	6	
User experience analysis	UNAN			3	4	5		
User experience design	HCEV			3	4	5	6	
User experience evaluation	USEV		2	3	4	5	6	
Content management		1	2	3	4	5	6	7
Content authoring	INCA	1	2	3	4	5	6	
Content publishing	ICPM	1	2	3	4	5	6	
Knowledge management	KNOW		2	3	4	5	6	7
Computational science		1	2	3	4	5	6	7
Scientific modelling	SCMO				4	5	6	7
Numerical analysis	NUAN				4	5	6	7
High-performance computing	HPCC				4	5	6	7
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Relationships and engagement								
Stakeholder management		1	2	3	4	5	6	7
Sourcing	SORC		2	3	4	5	6	7
Supplier management	SUPP							7
Contract management	ITCM							
Stakeholder relationship management	RLMT				4			7
Customer service support	CSMG	1	2	3				
Business administration	ADMN	L.						
	- aprilly							
Sales and marketing		-1	2	3	4	5	6	7
Marketing	MKTG		2					
Selling	SALE							
Sales support	SSUP	1						

Skills

**Development and implementation** 

#### The global skills and competency framework for the digital world

Application support if Infeatructure System software System software System software System software S	TIMG ASUP TOP SYSP WIAS HSIN EPMG ECMG COMA SLMO SCOMG AWMT CPMG USUP PBMG SEAC CAMA SEAC SCAD MUAS SEAC	1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
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Service management Service soft management Service soft management Capacity management	SLMO SCMG AVMT CPMG USUP PBMG CHMG ASMG SEAC SCAD VUAS DGFS	1	2 2 2 2 2 2	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
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Penetration testing			-			
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People management Performance management Employee experience Organisational facilitation Professional development				3	4	5
Performance management Employee experience Organisational facilitation Professional development						
Performance management Employee experience Organisational facilitation Professional development		,	2	x	4	5
Employee experience I Organisational facilitation Professional development	PEMT				4	5
Organisational facilitation Professional development	EEXP					
Professional development	DFCL					
Workforce planning	PDSV					
	NEPL					
Resourcing	RESC			3	4	5
Skills management		1	2	3	4	5
	ETMG					
	IMCR					
	FTDI					
			2			
Certification scheme operation	LEDA		2			

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	2	3	4	5	6	7
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1	2	3	4	5	6	7
	2	3	4	5	6	1
1	2					

#### Level 1 - Follow Level 2 - Assist Level 3 - Apply Level 4 - Enable Level 5 - Ensure, advise Level 6 - Initiate, influence work describes seven levels sponsibility, accountability m Level 1, the lowest, to Level en levels is labelled with a to summarise the level of el 7 - Set strategy, inspire, i

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#### Roles & Responsibilities



## Scope of EA

Segmentation:

- Activities
  - Capability-based = differentiation form competition
  - Process-Based = organizational processes
  - Value-Stream Based = products & services
- Domains
  - Business
  - Data & Information
  - Application
  - Technology
  - Security
- Depth & Breadth
  - Paritioning

### Process of EA

Process Model:

• Embed ADM processes with the organization's processes

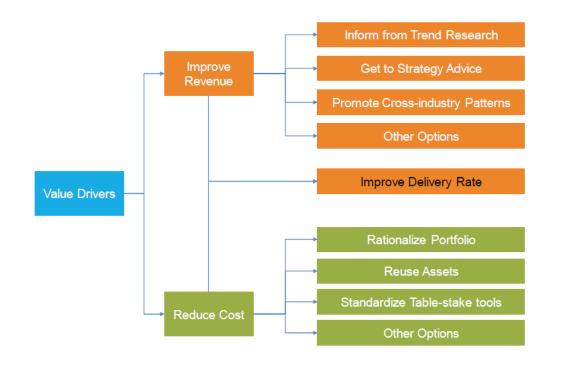
Processes:

- Decision-Making Processes
- Execution Processes
- Strategy Development Processes
- Portfolio & Program Management Processes
- Project Initiation Processes
- Budgeting Processes
- Operational Management Processes
- Governance Processes
- Risk Management Processes



## EA Capabilities Realization

- EA Roadmap
  - EA Value: map to Enterprise Value





• EA Capability Model

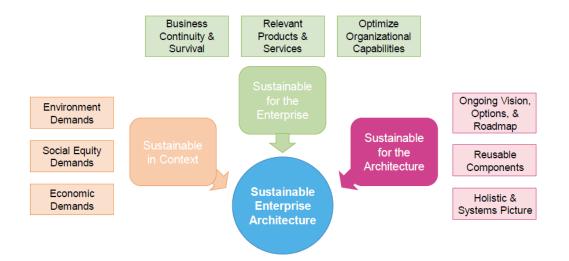
Manage Planning	Manage Enterprise	Analyze & Mitigate	Provide Oversight
& Strategy	Architecture	Enterprise Gaps	& Value
Maintain Strategic Planning Process Manage Strategic Plan Monitor Future Trends (technology & business) Develop Tactical Plans to maintain value & relevance Manage Service & Operating Models Manage Enterprise Knowledge Retention Policies	Manage Team Capacity Manage EA Scope Manage Business Architecture Manage Data Architecture Manage Applications Architecture Manage Technology Architecture Manage Security Architecture Manage Standards	Manage Architecture Knowledge Base Performance Future State Analysis Develop Mitigation Plans Manage Business Case Develop Roadmaps Engage in IT & Project/Program Operations Plan for Obsolescence	Manage Architecture Board Provide External Oversight to IT & Strategy Define & Manage Performance Metrics Manage Communication & Collaboration Approach Measure Architect & Architecture Success

- EA Evolving
- 1. Purpose
  - Cost Control
  - Risk Optimization
  - Strategy Development
- 2. Trusted Advisor = Instigator of Change
- 3. Change Management

## EA Capabilities Realization

- EA Evolving
- 1. Purpose
  - Cost Control
  - Risk Optimization
  - Strategy Development
- 2. Trusted Advisor = Instigator of Change
- 3. Change Management
- 4. Sustaining and Maturing

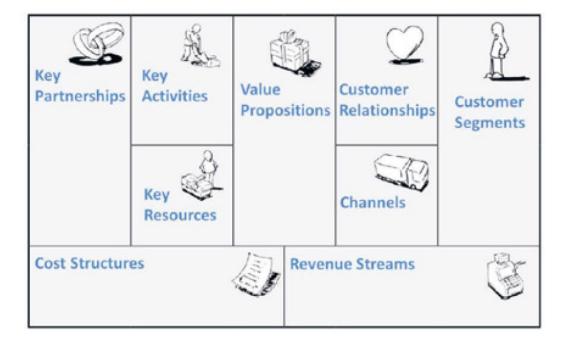
- Sustainable EA
  - Sustainable in Context
  - Sustainable for the Enterprise
  - Sustainable for the Architecture

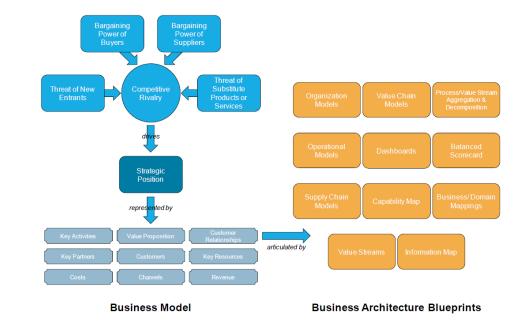




# **Business Architecture**



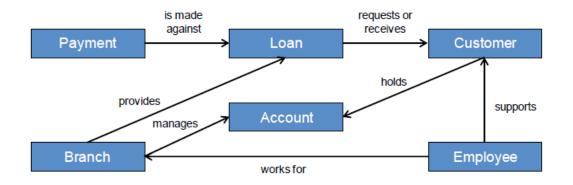




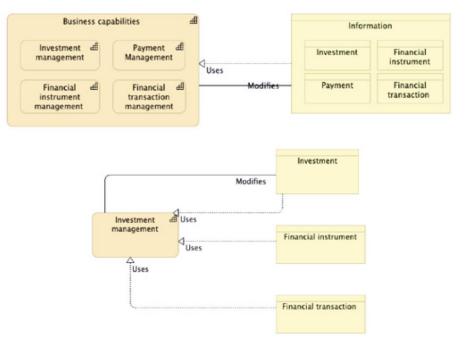


### Information Model

#### Information Map:

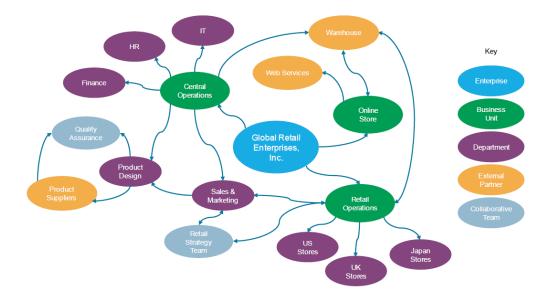


#### Information/Business Capability Map:





### Organization Map





### **Business Scenarios**

1 – Problem (pain points, barriers, issues)

> 2 – Environment (business and technology, value streams, business capabilities)

> > 3 – Outcomes (SMART – Specific, Measurable, Actionable, Realistic, and Time-bound)

> > > 4 – Human Actors (capabilities, roles, and responsibilities)

> > > > 5 – Computer Actors (capabilities, roles, and responsibilities)

#### Steps:

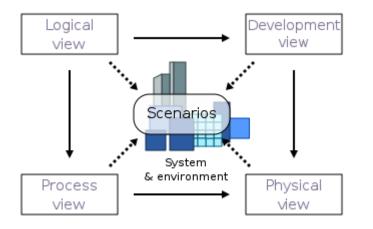
- Plan
- Gather Information
- Analyze/Process
- Document
- Review



# Appendix

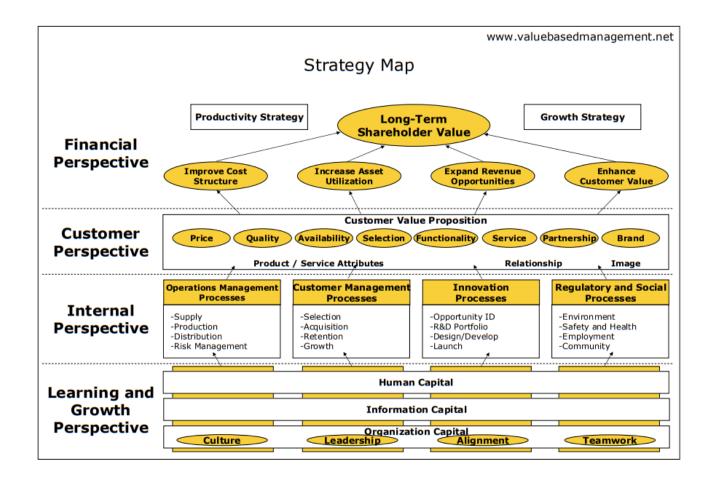
### 4+1 View

- Logical View:
  - Functionality of the system
  - Class diagrams
  - State diagrams
- Process View
  - Dynamics of the system
  - Sequence diagram
  - Communication diagram
  - Activity diagram
- Development View
  - Implementation of the system
  - Component diagram
- Physical View
  - Engineering view of the system
  - Deployment diagram
- + Scenaro's
  - Use Case diagrams





## Kaplan Strategy Map

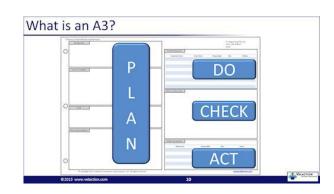




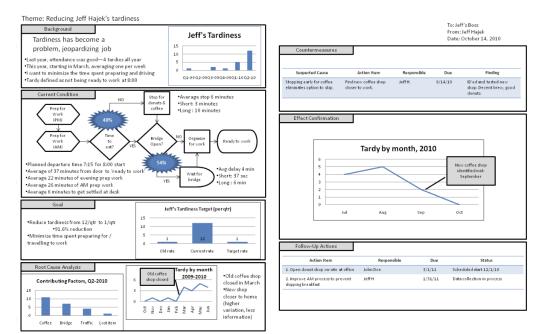
## A3 Thinking

#### PDCA:

- Plan
- Do
- Check
- Act







- Background
- Current Condition
- Goal
- Root Cause Analysis
- Countermeasures
- Effect Confirmation
- Follow-Up Actions