

Chapter	Topics	Keywords	Input	Output
Technology Architecture)	<p>Objectives:</p> <ul style="list-style-type: none"> • Develop Target Architecture addressing Request for Arch Work & Stakeholder Concerns • Identify candidate Architecture Road-map Components from Gap Analysis 	<p>BUSINESS Architecture:</p> <p>Describe how the enterprise needs to operate to</p> <ul style="list-style-type: none"> • Achieve the Business Goal • Respond to strategic drivers in Arch Vision • Address 'Request for Architecture Work' • Address Stakeholder Concern <p>Business Strategy = WHAT to achieve Business Architecture = HOW to achieve</p> <p>Phase B = To demonstrate 'Business Value' to key stakeholders</p>	<p>BUSINESS Architecture:</p> <ul style="list-style-type: none"> • Request for Arch Work • Refined statements of Business Principles, Goals & Drivers • Capability Assessment • Communications Plan • Org Model for EA • Tailored Arch Framework • Approved Stmt of Arch Work • Arch Principles • Arch Vision • Draft Arch Definition Doc 	<p>BUSINESS Architecture:</p> <ul style="list-style-type: none"> • Validated Business Principles, Goals & Drivers • Elaborated Business Principles • Draft Architecture Definition Doc • Draft Arch Requirement Spec Doc • Business Arch roadmap components
	<p>Steps:</p> <p>1. Select Ref Models, Viewpoints & Tools</p> <ul style="list-style-type: none"> - select relevant architecture resources from Arch Repo - select relevant architecture viewpoints - identify tools & techniques for Capture, Modeling & Analysis with Viewpoints - determine overall modeling process - confirm if all stakeholder 'concerns' are addressed, if not create new models or update existing models - identify required catalogs of Building Blocks - identify type of requirements to be collected <ul style="list-style-type: none"> • Rqmts to be met by Architecture • Formalize the focused requirements • Provide rqmts input for subsequent arch domains 	<p>DATA Architecture:</p> <ul style="list-style-type: none"> • Review/Generate & Validate Data Principles (Step 1) • Determine overall modeling process <ul style="list-style-type: none"> - Select models needed to support specific view required. DODAF, ARTS & ENERGETICS Data Models. <p>APPLICATION Architecture:</p> <p>Application = Logical groups of capabilities that process business data & support business</p> <ul style="list-style-type: none"> • Review/Generate & Validate Application Principles (Step 1) 	<p>Data & App Arch Phase:</p> <ul style="list-style-type: none"> • Request for Arch Work • Refined statements of Business Principles, Goals & Drivers • Capability Assessment • Communications Plan • Org Model for EA • Tailored Arch Framework • Approved Stmt of Arch Work • Arch Principles • Arch Vision • Draft Arch Definition Doc • Draft Arch Req Spec Doc • Business Arch Components of an Arch Roadmap 	<p>Data Arch phase:</p> <p>Validated or New Data principles Draft Architecture Definition Doc Draft Arch Requirement Spec Doc Data Arch roadmap components</p> <p>App Arch phase:</p> <p>Validated or New App principles Draft Architecture Definition Doc Draft Arch Requirement Spec Doc App Arch roadmap components</p>
	<p>2. Develop Baseline Architecture Description</p> <ul style="list-style-type: none"> - should be complete, but without unnecessary detail - if possible, identify relevant ABBs, Drawing on Repo - if not, develop new Arch Description/Models <p>3. Develop Target Architecture Description</p> <ul style="list-style-type: none"> - if possible, identify relevant ABBs, Drawing on Repo - if not, develop new Arch Description/Models 	<p>TECHNOLOGY Architecture: (Step 1)</p> <ul style="list-style-type: none"> • For each BB, build-up a Service Desc Portfolio • Service Desc Portfolio = Set of services to be provided for a TA Building Block. 	<p>Technology Arch phase:</p> <ul style="list-style-type: none"> • Draft Arch Definition Doc • Draft Arch Rqmts Spec Doc • Buss, Data & App Arch Components of an Arch Roadmap 	<p>Technology Arch phase:</p> <ul style="list-style-type: none"> • Stmt of Arch Work (Updated) • Validated or New App principles • Draft Arch Definition Doc • Draft Arch Rqmt Spec Doc • Tech Arch comp of an Arch Roadmap

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<p>4. Perform Gap Analysis</p> <ul style="list-style-type: none"> - Verify Arch Models for consistency & accuracy - Perform Trade-Off analysis to resolve conflicts - Test Arch Models for completeness against Rqmts - Identify Gaps btwn Baseline & Target <p>5. Define Candidate Road-map Components</p> <ul style="list-style-type: none"> - This initial Architecture roadmap will be used to support a detailed one in Phase E (Opp & Solutions) <p>6. Resolve impact across Architecture Landscape</p> <ul style="list-style-type: none"> - Does this Architecture impact on existing Arch ? - Have recently made changes impact this Arch ? - Does this Architecture impact other projects ? - Will this Architecture be impacted by other projects ? 		<p>Matrix of Business ABBs =</p> <ul style="list-style-type: none"> • Current Arch + New Service = X Axis • Target Arch + Eliminated Service = Y Axis 	
<p>7. Conduct Formal Stakeholder Review</p> <ul style="list-style-type: none"> - Formal review of Model & Build Blocks - Compare Statement of Arch work against proposed Architecture & conduct Impact Analysis - If Impact requires revision of previous Architecture Domain, revisit the previous phases <p>8. Finalize the Architecture</p> <ul style="list-style-type: none"> - Select standards for each ABB, reusing from Repo - Fully Document each ABB - Cross-check the Arch against Business Goal/Rqmts - Document final rqmts traceability report - Document final mapping of Arch within Repo - Identify reusable ABBs & publish via the Repo 		<p>DATA Architecture:</p> <ul style="list-style-type: none"> • Target Architecture includes <ul style="list-style-type: none"> - Business Data Model - Logical Data Model - Data Mgmt process Model - Data Entity/Business Function Matrix • Arch Rqmts Specification <ul style="list-style-type: none"> - Data interoperability requirements - Changes in Business Arch to comply with Data Arch <ul style="list-style-type: none"> - Constraints on Tech Arch about to be designed 	
<p>9. Create Architecture Definition Document</p> <ul style="list-style-type: none"> - Document the rationale for all Building Block decisions - Prepare 'appropriate section' of the Arch Definition Doc Report - Use report/graphics by modeling tools to demo Key Views - Send for review by relevant Stake Holders - Incorporate Feedback <p>Draft 'Architecture Definition Document'</p> <ul style="list-style-type: none"> - Baseline Architecture - Target Architecture - Views addressing Key Stakeholder concerns <p>Draft 'Architecture Req Specification' Document</p> <ul style="list-style-type: none"> - Gap Analysis Results - Updated Technical Requirements - Updated Business Requirements 		<p>APPLICATION Architecture:</p> <ul style="list-style-type: none"> • Target Architecture includes <ul style="list-style-type: none"> - Process systems Model - Place systems Model - Time systems Model - People systems Model • Arch Rqmts Specification <ul style="list-style-type: none"> - App interoperability requirements - Changes in Business Arch to comply with App Arch <ul style="list-style-type: none"> - Constraints on Tech Arch about to be designed 	

<p style="text-align: center;">Phase C (Information Systems Architecture)</p>	<p>Implementation Approach 1: Design = Top-Down - In the order of "Business, Data, App & Technology" Implementation = Bottom-Up - In the order of "Technology, App, Data & Business"</p> <p>Implementation Approach 2: Implementing order of systems would be - creating data, processing data & archiving data</p>	<p style="text-align: center;">TOGAF 9 - Vol II</p> <p>Implementation Approach 3: Use generic models relevant to Org's Industry Vertical - ARTS = Retail / ENERGETICS = Petrochemical</p> <p>Considerations for Data Architecture: - Data Management, Migration & Governance (MMG)</p>		
<p style="text-align: center;">III-RM</p>	<ul style="list-style-type: none"> • Supports 'Boundryless Information Flow' • Expanded sub-set of TRM <p>Components of III-RM:</p> <ul style="list-style-type: none"> • Taxonomy + III-RM Graphic <p>Components of High-Level III-RM:</p> <ul style="list-style-type: none"> • Business Apps - Info Consumer, Producer & Brokering • Infra Apps - Dev Tools & Mgmt Utilities • App Platform - Provides supporting services to all apps, to locate, access & move info within the environment • Interface - Protocols, APIs, formats • Quality 	<ul style="list-style-type: none"> • An Applications Architecture reference Model • A model of App components & App service s/w required for an Integrated Information Infrastructure <p>• High level view</p> <ul style="list-style-type: none"> - Info Consumer Apps + Info Producer Apps + Brokering Apps + Dev Tools + Mgmt Utilities (on top of Application Platform) 		
<p style="text-align: center;">Foundation Architecture (TRM)</p>	<p>Foundation Architecture supports all the CSAs & complete enterprise operating environment .</p> <ul style="list-style-type: none"> • TRM is an example of Foundation Architecture • Components: Taxonomy & TRM Graphic <p>Service Qualities of App Platform - Describes behavior</p> <ul style="list-style-type: none"> • Availability - Manageability, Serviceability, Performance, Reliability, Recoverability & Locatability • Assurance - Security, Integrity & Credibility • Usability • Adaptability - Interoperability, Scalability, Portability, Extensibility & Accessibility 	<ul style="list-style-type: none"> • TOGAF ADM is not dependent on the TRM 		

Implementation Factor Assessment & Deduction

Matrix

- Has the factors influencing the Impl & Migration plan
- Created in Phase E and Input to Phase F
- Repository for Arch Impl & Migration Decisions

Consolidated Gaps, Solutions & Dependencies Matrix

- To consolidated Gap analysis results from Phase B to D
- Group the gaps & assess potential solutions & dependencies between gaps
- Created in Phase E and Input to Phase F
- Planning tool for creating work packages
- Dependencies drives creation of projects & mig planning

- Both Matrix created in Phase E & Input to Phase F
- Both Tables & Technique created & used in Phase F

Architecture Definition Increments Table

- Allows architect to plan a series of Transition Architecture outlining the status of the EA at specified times
- Created in Phase F
- Consists of projects listing & assigning their deliverables across Transition Architectures

Transition Architecture State Evolution Table

- To show the proposed state of the Arch at various level of TRM
- Created in Phase F

Business Value Assessment Technique

- Assess Business value against Value-Risk Index matrix
- Created in Phase F
- VALUE = Compliance, Strategic Alignment & Competitive Position
- RISK = Size, Complexity, Org Capacity & Impact of a failure

Phase E
(Opportunities & Solutions)

Objective:

- Generate complete version of Arch Roadmap
- Determine if incremental approach is required
- If so, create Transition Architectures

Steps:

1. Determine Corporate Change Attributes
 - Create Impl Factor Assessment & Deduction Matrix
 - Assess Transition Capabilities of End & IT Orgs
2. Determine Business constraints for Implementation
 - Review Corp & LoBs Strategic Plan
 - Review Enterprise Arch Maturity Assessment
3. Review & Consolidate Gap Analysis Results
 - Create Consolidated Gap,Sol & Dependencies Matrix
4. Review consolidated requirements
 - Assess the matrix to identify minimal set of requirements for work packages

5. Consolidate & Reconcile Interoperability Rqmts
 - consolidated interop rqmts & identify any constraints by the potential set of solutions
6. Refine & Validate Dependencies
 - Dependencies used to determine sequence of Impl
 - Also used to identify logical increments of Delivbls
7. Confirm Readiness & Risk for Business Transformation
 - Review BTRA (created in Phase A)
 - Determine impact on Roadmap & Impl and Mig Strategy
 - Perform Risk Mgmt for risks associated with Transformation Effort
 - Risks added to Consolidated Gaps, Solutions & Dependencies Matrix

8. Formulate Implementation & Migration Strategy
 - Determine overall strategic approach
 - Greenfield/Revolutionary/Evolutionary
 - Determine Implementation Approach
 - Quick Win/Achievable Targets/Value Chain
9. Identify & Group major Work Packages
 - Use both matrices to group activities to work pkgs
 - Indicate the solution should be a
 - New Dev/Based on Existing/Purchased
 - Classify current System
 - Analyze Work Pkgs & group into portfolios & projects
10. Identify Transaction Architectures
11. Create Roadmap & Implementation and Migration Plan
 - Consolidate work pkgs & Transition Archs to Architecture Roadmap ver 0.1
 - Impl & Mig plan should align to Arch Roadmap

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- Logically groups changes into Work Packages
- Dependencies & Implementation Strategy become basis for creation of Work Packages

Systems are classified as

- **Mainstream** Systems = Future Impl System
- **Contain** Systems = likely to be replaced in 3 yrs
- **Replace** Systems = to be replaced in 3 yrs

- Project Context Diagram
- Benefits Diagram

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- **Product Information**
- **Planning Methodologies**
- **Change Requests for existing Programs & Projects**
- **Candidate Arch Roadmap components from B,C & D Phase**
- **Governance models & frameworks**

- Request for Arch work
- Capability Assessment
- Communications Plan
- Tailored Arch Framework
- Stmt of Arch Work
- Vision
- Draft Arch Definition Doc
- Draft Reqmt Spec Doc

- Statement of Arch Work
- Arch Vision
- Draft Arch Definition Doc
 - **Transition Architectures**
- Draft Rqmt Spec Doc
 - **Consolidated Gaps, Solutions & Dependencies Assessment**
- Capability Assessment
 - **Business & IT Capability Assessment**
- Arch Roadmap (including)
 - **Work pkg portfolio**
 - **Transition Architectures**
 - **Implementation Reco**
 - **Impl & Migration Plan (Outline)**

Phase F
(Migration Planning)

Objective:

- Finalize the Arch Roadmap & Impl and Migration Plan & Ensure Business Value & Cost are understood by Key Stakeholders

Steps:

1. Confirm Mgmt Framework interactions for Mig plan
 - Co-ordinate Implementation & Migration plan with Orgs existing framework
2. Assign Business Value to each Work Package
 - Use Risk-Value Index to calculate Business Value
 - If Capability-Based planning is used, then use BV associated with the capability
3. Estimate Resource rqmts, Proj timings
 - Determine Cost to create, run & sustain capability
 - Identify costs by decommissioning existing systems & Assign resource to each activity & aggregate at Proj

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- Business Value Assessment technique is used
- Transition Architecture tables are created & used

- Request for Arch work
- Capability Assessment
- Communications Plan
- Governance Model & fwks
- Org Model
- Tailored Arch Framework
- Stmt of Arch Work
- Vision
- Draft Arch Definition Doc
- Draft Reqmt Spec Doc

- Impl & Migration Plan (**Detailed**)
- **FINALIZED** Arch Definition Document Including
 - **Finalized** Transition Archs
- **FINALIZED** Arch Requirements Spec
- **FINALIZED** Arch Roadmap
- **Re-usable SBBs**
- Implementation Governance Model
- Change Requests

4. Prioritize Migration Projects
 - Prioritize by ascertaining BV vs. Cost of delivering them
 - Determine net benefit of all SBBs delivered by projs
 - Verify if risks have been mitigated & factored in
 - Create prioritized list of projects
5. Confirm Arch Roadmap & update Arch Defn Doc
 - Update the Architecture Roadmap & Transition Archs
 - Trans Arch State Evol table is used in Arch Defn Doc

6. Generate the Implementation & Migration Plan
 - Transition Arch will act as milestones
 - Integrate all projects, activities,dependencies & impact of change into a Project Plan
7. Complete Arch Dev cycle & document Lessons Learned
 - Lessons learned are documented

Phase G (Implementation Governance)		TOGAF 9 - Vol II			
		Phase H (Arch Change Management)	<p>Objective:</p> <ul style="list-style-type: none"> • Ensure conformance with Target Architecture by Implementation projects • Perform appropriate Arch Governance functions <p>Steps:</p> <ol style="list-style-type: none"> 1. Confirm Scope & Priorities <ul style="list-style-type: none"> - Produce recommendations on deployment - Make recommendation on deployment issues - Identify EA priorities for development teams - Gap analysis on EA and Solutions Framework 2. Identify Deployment Resources & Skills <ul style="list-style-type: none"> - Identify development method for soln development 3. Guide Development of Solutions Deployment <ul style="list-style-type: none"> - Document Architecture Contract - Provide service rqmts derived from EA 	<ul style="list-style-type: none"> • Development happens in parallel with Phase G • Document Architecture Contract • Perform EA Compliance Reviews • Publish NEW Baseline Architecture to Arch Repo 	<ul style="list-style-type: none"> • Arch Rqmts Spec • Architecture Roadmap • Implementation Gov Model • Architecture Contract • Request for Arch Work from Phase E & F • Impl & Migration Plan
<ol style="list-style-type: none"> 4. Perform EA Compliance Reviews <ul style="list-style-type: none"> - Review implementation governance - Review arch compliance for each BBs - Conduct post development reviews - Close development part of deployment projects 5. Implement Business & IT Operations <ul style="list-style-type: none"> - Carry out deployment projects - Publish new Baseline Architecture to Arch Repo 6. Post-Implementation Review & Close Implementation 					
	<ul style="list-style-type: none"> • Goal = Ensure that Architecture achieves Original Target BUSINESS VALUE • Done via <ul style="list-style-type: none"> - Ensuring changes to Arch are managed properly - Supporting a dynamic Architecture <p>Change Mgmt Process (to determine type of Change)</p> <ul style="list-style-type: none"> • Register all events that may impact the Architecture • Allocate Resources for Architecture tasks • Resources make assessment of what should be done • Evaluate the Impact <p>Steps:</p> <ol style="list-style-type: none"> 1. Establish Value Realization process <ul style="list-style-type: none"> - Influence Business projects to exploit EA for value realization (outcomes) 2. Deploy Monitoring Tools <ul style="list-style-type: none"> - Monitor Technology/Business changes that could impact baseline - Monitor EA capability maturity 	<p>Categories of Architecture Change</p> <ul style="list-style-type: none"> • Simplification , Incremental and Re-Architecting <p>Impacts >= 2 Stakeholders = Re-Architecting Impacts 1 Stakeholder = Change Management</p> <p>Change Request</p> <ul style="list-style-type: none"> • Description , Rationale & Impact Assessment 	<ul style="list-style-type: none"> • Request for Arch Work • Org Model for EA • Talored Arch Framework • Stmt of Arch Work • Vision • Repository • Arch Definition Doc • Arch Rqmts Specification • Arch Roadmap • Change Requests (Due to Tech/Business changes) • Implementation Gov Model • Arch Contract • Compliance Assessments • Impl & Migration Plan 	<ul style="list-style-type: none"> • Architecture Updates • Changes to Architecture framework & principles • New Request for Arch Work, to initiate another cycle of ADM • Statement of Arch Work • Architecture Contract • Compliance Assessments 	

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">ADM Arch Requirements Mgmt</p>	<ul style="list-style-type: none"> • Ensure Rqmts Management sustains at all ADM Phases • Ensure Arch Rqmts are available for use at each Phase <ul style="list-style-type: none"> • Business Scenarios • Volere Requirements Specification Template • The 'Waiting Room' - repo to hold requirements beyond scope and reserved for future. <p>Steps:</p> <ol style="list-style-type: none"> 1. Identify/Document Requirements 2. Baseline Requirements 3. Monitor Baseline 4. Identify Changed Requirements 5. Record Changed requirements & record priorities 6. Assess Impact of Change 7. Implement Changes arising from Phase H 8. Update Rqmts repo with changes 9. Implement changes in current phase 10. Assess & revise gap analysis for past phases 	<p style="text-align: center;">TOGAF 9 - Vol II</p> <ul style="list-style-type: none"> • Requirements Management process DOES NOT dispose of, address or prioritize Requirements. It is done within ADM Phases 		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Architecture Partitioning</p>	<p>Why Partitioning, to Manage</p> <ul style="list-style-type: none"> • Complexity, Conflicts, Parallel Developments & Re-Use <p><u>Characteristics for Partitioning</u></p> <ul style="list-style-type: none"> • Level of Abstraction • Subject Matter • Viewpoints <p>Preliminary Phase supports identification of appropriate Arch Partitioning and establishment of Governance</p>	<p><i>Architectures describing particular Solution Approaches, best Practices or Patters can become REFERENCE MODELS</i></p> <p><u>Solutions Characteristics</u></p> <ul style="list-style-type: none"> • Subject Matter, Time & Maturity/Volatility <p><u>Architecture Characteristics</u></p> <ul style="list-style-type: none"> • Subject Matter, Viewpoints, Level of Detail, Level of Abstraction and Accuracy <p>Partitioning the Arch Landscape:</p> <ul style="list-style-type: none"> • Don't use Abstract Architectures & Solution Volatility 		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Adapting the ADM Iteration & Levels</p>	<p>0. Iteration to Develop Comprehensive Arch Landscape</p> <ul style="list-style-type: none"> • Between multiple ADM cycles <ol style="list-style-type: none"> 1. Architecture Capability Iteration <ul style="list-style-type: none"> • Prelim to Phase A 2. Architecture Development Iteration <ul style="list-style-type: none"> • Phase A to F 3. Transition Planning Iteration <ul style="list-style-type: none"> • Phase E to F 4. Architecture Governance Iteration <ul style="list-style-type: none"> • Phase G to H 	<p>Approaches to Architecture Development</p> <ul style="list-style-type: none"> • Baseline First or Target First <p>Architecture Landscape is organized using</p> <ul style="list-style-type: none"> • Breadth / Subject Matter • Depth • Time • Recency 		

Incomplete

Adapting ADM Security

It is intended to inform the Enterprise Architect of the Security Architecture task & role

Requirements Management

- Security Policy and Security Standards become a part Preliminary Phase
- Scope of Org impacted by Security Architecture
- Define required security capability
- Implement Security Architecture Tools

Phase A

- Obtain mgmt support for Security Measures
- Determine Disaster recovery or Buss continuity rqmts
- Determine system criticality

Phase B

- Determine the legitimate actors
- Determine acceptable level to inconvenience with security measures
- Determine assets at risk if something goes wrong and also their cost and ownership
- Determine & document forensic process

Adapting the ADM: SOA

Architecture Maturity Models

Capability Maturity Models gives an effective method to **control and improve** Change Process

6 Levels of Architecture Maturity:

- None -> Initial -> Under Development -> Defined -> Managed -> Measured

9 Architecture Elements:

- Architecture Process
- Architecture Development
- Business Linkage
- Senior Management Involvement
- Operating Unit Participation
- Architecture Communication
- IT Security
- Architecture Governance
- IT Investment & Acquisition Strategy

Maturity Assessments are referred in Prelim Phase - part of Org Model for EA
Phase A - part of Capability Assessment
Phase E - revisiting Capability Assessment for Mig plan

Benefits:

- Describe practices to follow to improve process
- Provides measures for improvement
- Provides framework to manage improvements
- Organize various levels of Maturity

Architecture Skills Framework

Benefits of Skills framework:

- Reduced time, cost, risk in training, hiring & managing Architecture professionals
- Reduced time & cost to set-up an Arch practice
- Reduces time, cost & risk of overall solution development

Framework Defines:

- Roles within an EA work area
- Skills required by those roles
- Depth of knowledge required by the role

Architecture Team consists of:

- Arch Board Members
- Arch Sponsor
- Arch Manager
- Architects for
 - Enterprise Architecture
 - Business, Data, App, Technology Architecture
 - Program/Project Managers
 - IT Designer