

TOGAF - The Open Group Architecture Framework

A Presentation to the
The Architecture Practitioners' Conference
Washington, DC 23rd October 2003

THE *Open* GROUP

John Spencer
Director, Architecture Forum

j.spencer@opengroup.org

Apex Plaza
Forbury Road, Reading
Berkshire, RG1 1AX
United Kingdom

Tel +44 118 950 8311 x2244
Fax +44 118 950 0110
www.opengroup.org

THE *Open* GROUP

Agenda

- ❑ The Open Group Architecture Forum
- ❑ TOGAF
 - background
 - components
- ❑ TOGAF Architecture Development Method
- ❑ Plans for the Future
- ❑ Documentation overview
- ❑ Summary

The Open Group Architecture Forum

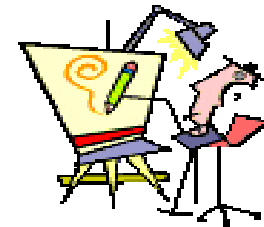
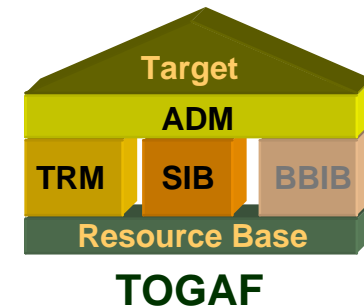
The Open Group Value

- ❑ Address the “more for less” issue
 - Membership model based on leverage
 - Get more done cheaper, better, faster
- ❑ Access to people with similar problems
 - At CIO level and architecture level
- ❑ Access to tools and people to help solve the problems
 - TOGAF ADM, reusable architecture artifacts and other resources
 - Network with other architecture practitioners



Architecture Forum – Vision

- ❑ An effective open framework and method
- ❑ Architecture as a professional discipline
- ❑ Adequate “Commercial Off-The-Shelf” tools

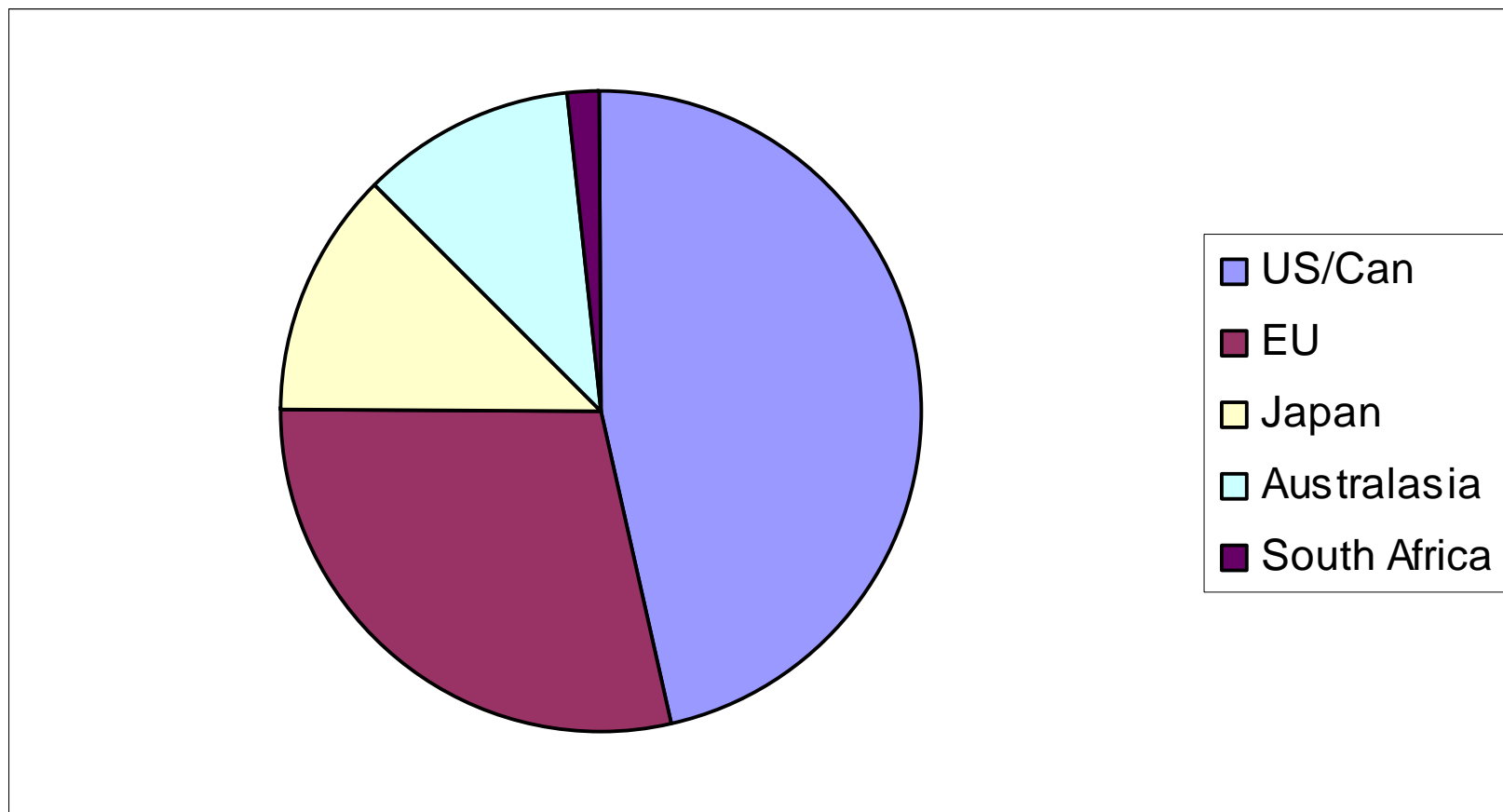


57 current members

Architecture Forum membership

- Architecting-the Enterprise (UK)
- BMC Software Inc. (US)
- Booz Allen & Hamilton (US)
- Boeing Corporation (US)
- Brandeis University (US)
- C and C Technology (UK)
- Capita IT Services (UK)
- Capital Health Authority (Canada)
- CC and C Solutions (Australia)
- Centre For Open Systems (Australia)
- ChiSurf (Hong Kong)
- Computacenter (UK)
- Computas (Nor)
- Computer Associates (US)
- Conclusive Logic (US)
- Dept for Works & Pensions (UK)
- Dept of Defense / DISA (US)
- Desktop Management Task Force (US)
- Frietuna Consultants (UK)
- Fujitsu (Japan)
- Hewlett-Packard (US)
- Hitachi (Japan)
- IBM (US)
- Innenministerium NordRhein-Westfalen (Germany)
- Jet Propulsion Labs (US)
- Lockheed Martin (US)
- MEGA International (Fra)
- Ministry of Defence (UK)
- MITRE Corporation (US)
- Monash University (Australia)
- NASA Goddard Space Flight Center (US)
- National Computerization Agency (Korea)
- NeTraverse, Inc. (US)
- Nexor, Inc. (US)
- Open GIS Consortium, Inc. (US)
- Popkin Software (US/UK)
- POSC (US)
- Predictive Systems (Germany)
- Primeur (Italy)
- QA Consulting (UK)
- Raytheon Corporation (US)
- Real IRM Solutions (South Africa)
- ReGIS (Japan)
- Rococo Company (Japan)
- SCO (US)
- Sun Microsystems (US)
- Teamcall (Belgium)
- Telemangement Forum (US)
- Toyota InfoTechnology Center (Japan)
- TRON Association (Japan)
- University of Plymouth (UK)
- University of Reading (UK)
- University of Kyoto (Japan)
- US Army Weapon Systems Technical WG (US)
- Veriserve Corporation (US)
- Weblayers, Inc. (US)
- Westpac Banking Corporation (Australia)

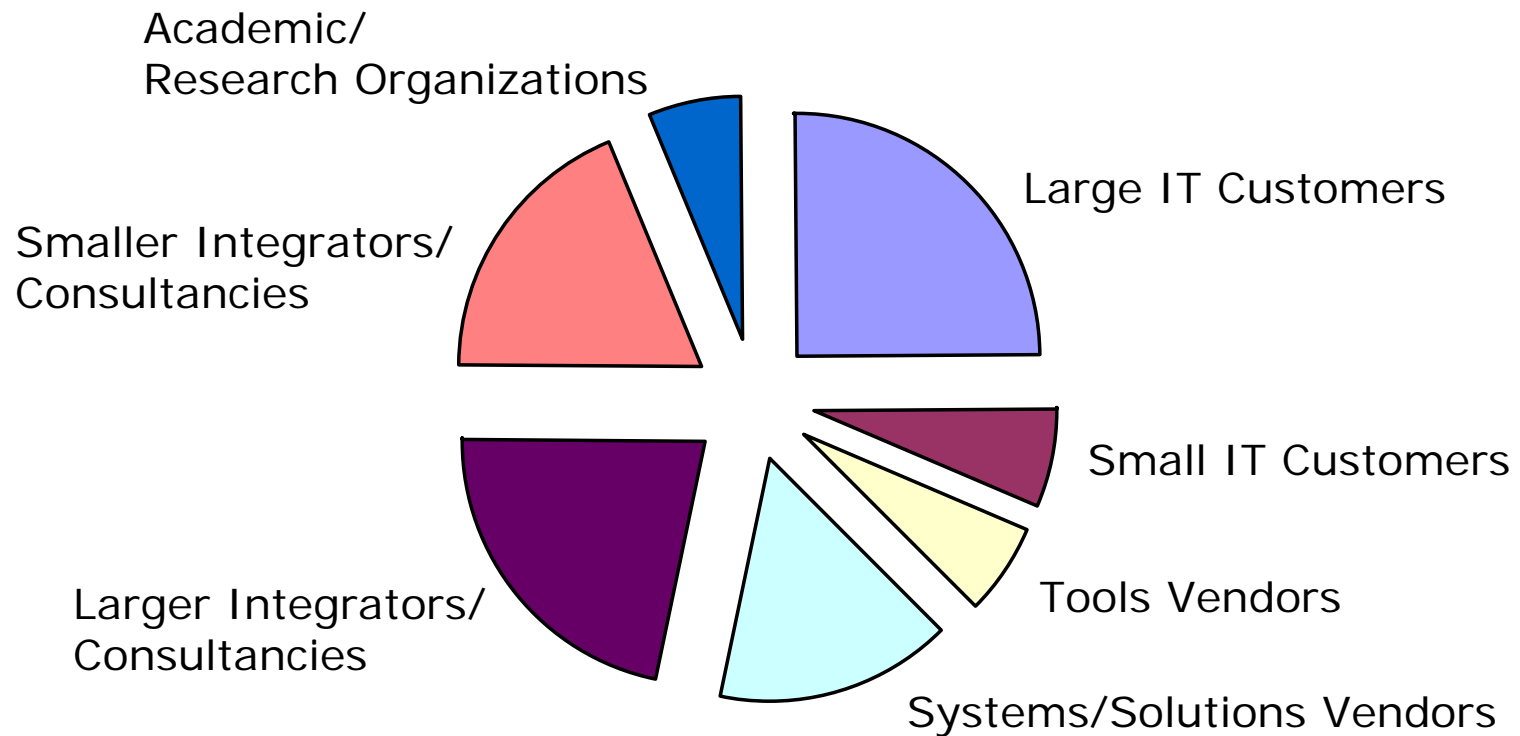
Membership: Geography



Membership: Stakeholders

- ❑ **Customer Architects:** **reduced time, cost, risk**
 - procuring effective IT architecture tools
 - developing an IT architecture
 - procuring products to implement an IT architecture
- ❑ **Tools Vendors:** **bigger market, bigger market share**
 - supporting open methods for architecture
- ❑ **IT Solution Vendors:** **greater cost-efficiency**
 - reduced cost of bidding, greater share of procurements
- ❑ **Integrators:** **greater cost-efficiency, better service**
 - better service delivery to clients
 - more effective use / re-use of own architecture assets
- ❑ **Academic / Research Organizations:** **funding support**
 - demonstrated relevance to market, route to standardization
 - “technology transfer” important in bids for funding

Membership: Organizations



TOGAF Background

TOGAF Origins

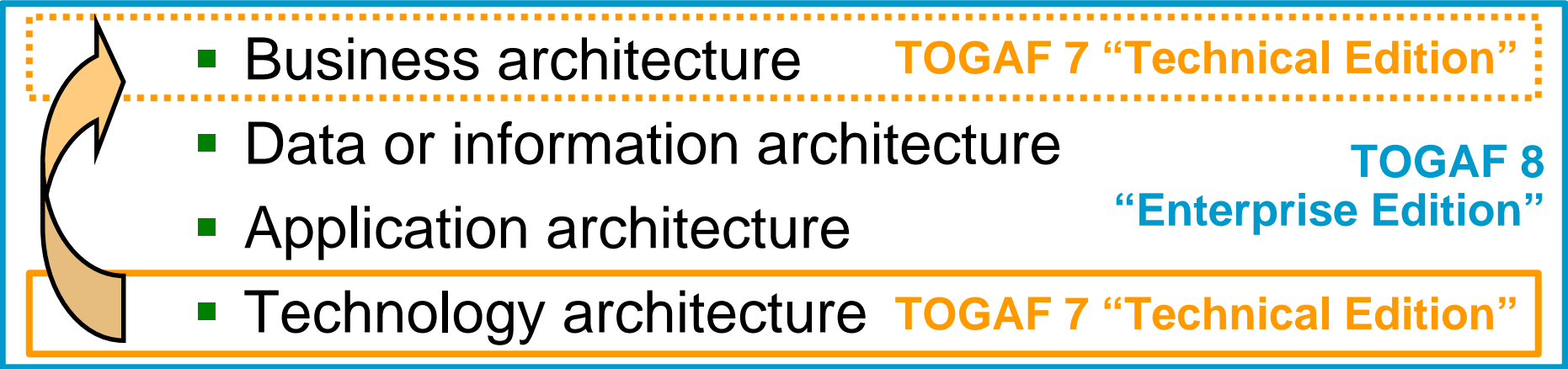
- ❑ A customer initiative
- ❑ A framework, not an architecture
 - A framework for developing architectures to meet different business needs
 - Not a “one-size-fits-all” architecture
- ❑ Originally based on TAFIM (U.S. DoD)

TOGAF Development

- ❑ 1994: Requirement  *Proof of need*
- ❑ 1995: TOGAF Version 1  *Proof of concept*
- ❑ 1996: TOGAF Version 2  *Proof of application*
- ❑ 1997: TOGAF Version 3  *Relevance to practical architectures
(building blocks)*
- ❑ 1998: TOGAF Version 4  *Enterprise Continuum (TOGAF in
context)*
- ❑ 1999: TOGAF Version 5  *Business Scenarios (architecture
requirements)*
- ❑ 2000: TOGAF Version 6  *Architecture views - IEEE 1471*
- ❑ 2001: TOGAF Version 7  *Architecture Principles; Compliance
Reviews*
- ❑ 2002: TOGAF Version 8  *Extension to Enterprise Architecture*

TOGAF Scope

- ❑ TOGAF covers the development of four related types of architecture:

- 
- Business architecture **TOGAF 7 “Technical Edition”**
 - Data or information architecture **TOGAF 8
“Enterprise Edition”**
 - Application architecture
 - Technology architecture **TOGAF 7 “Technical Edition”**

TOGAF Version 7 (“Technical Edition”)

- ❑ An industry consensus framework and method for Technical Architecture
 - Successful customer / vendor collaboration
- ❑ Vendor-, technology-, tool- neutral
- ❑ Proven in practice
 - 8 years continuous development & evolution
 - Used successfully in major projects / procurements around the world
- ❑ Publicly available
- ❑ Supported by a certification program.....

TOGAF 7 Certification

- A vendor-neutral, global basis of certification to impose standards for Technical Architecture within our profession



Architecture tools which support TOGAF 7



Training courses which instruct in TOGAF 7



Architects trained in the use of TOGAF 7



Professional services offered to support TOGAF 7

- Certification will be extended to TOGAF Version 8 as soon as appropriate

TOGAF Version 8: Market Motivations

- ❑ Increasing interest in Enterprise Architecture
 - Key focus: enterprise applications architecture / integration
 - Closer to the business = clearer Rol for architecture
 - Strong interest among US Federal Government
 - ❑ Several enterprise frameworks with mindshare:
 - Zachman, Spewak, DoD Framework, FEAF, TEAF, ...
 - Most focus on deliverables, not method
 - ❑ No industry standard method for enterprise architecture
- **Adapt TOGAF and its ADM as basis of an industry standard enterprise architecture framework and method**

TOGAF Version 8: Internal Motivations

- The Boundaryless Information Flow vision
 - Integrated access to integrated information across the extended enterprise
 - A problem space shared by many Open Group customer members

- Enterprise Architecture a key enabler for achieving the Boundaryless Information Flow vision

TOGAF Version 8 (“Enterprise Edition”): Goals

- Long-term: to make TOGAF...
 - an effective, industry standard framework and method for enterprise architecture
 - usable in conjunction with other frameworks, whose deliverables may be more relevant / specific to particular sectors.
 - TOGAF and
 - a framework and method for achieving the “Boundaryless Information Flow” vision

- Version 8:
 - An overall structure and core method for enterprise architecture that can be filled out in future years

TOGAF Structure and Components

TOGAF Structure and Components

- Architecture Development Method (ADM)
- Reference Architectures
 - Foundation Architecture
 - Technical Reference Model
 - Standards Information Base
 - Boundaryless Information Flow Reference Model (TOGAF Version 8)
 - Enterprise Continuum
- Resource Base

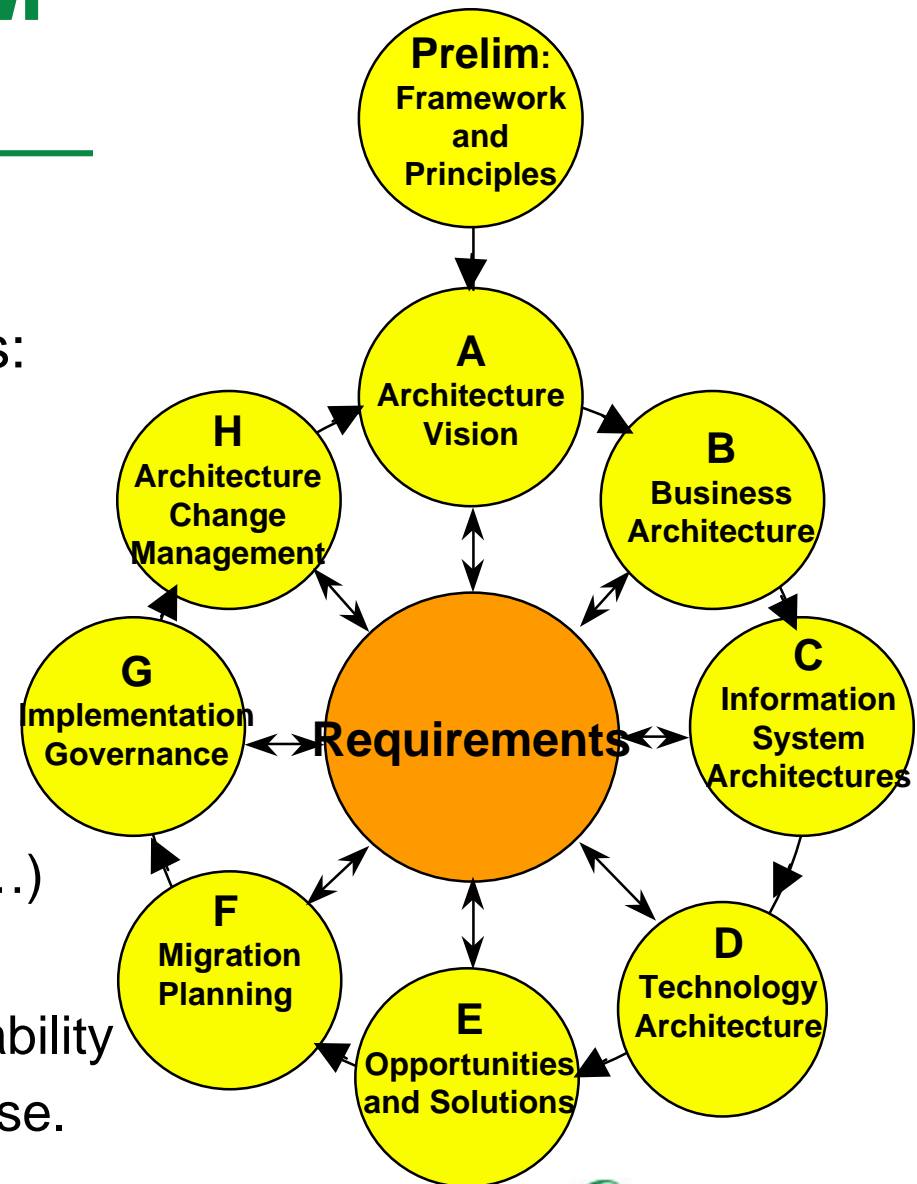
TOGAF “Enterprise Edition” – The Architecture Development Method (ADM)

TOGAF ADM Overview

- ❑ Open, industry consensus method for IT architecture
- ❑ Developing an organization-specific architecture to address business needs
- ❑ Architecture views to ensure that all stakeholder concerns are adequately addressed
- ❑ Quick-start foundation
- ❑ Practical, experience based guidance
- ❑ Adaptable to specific needs of a project

“Enterprise” ADM – Key Points

- ❑ An iterative method
- ❑ Each iteration = new decisions:
 - Enterprise coverage
 - Level of detail
 - Time horizon
 - Architecture asset re-use:
 - previous ADM iterations
 - other frameworks, system models, industry models,...)
- ❑ Decisions based on:
 - Competence / resource availability
 - Value accruing to the enterprise.



Preliminary: Framework / Principles

□ Inputs

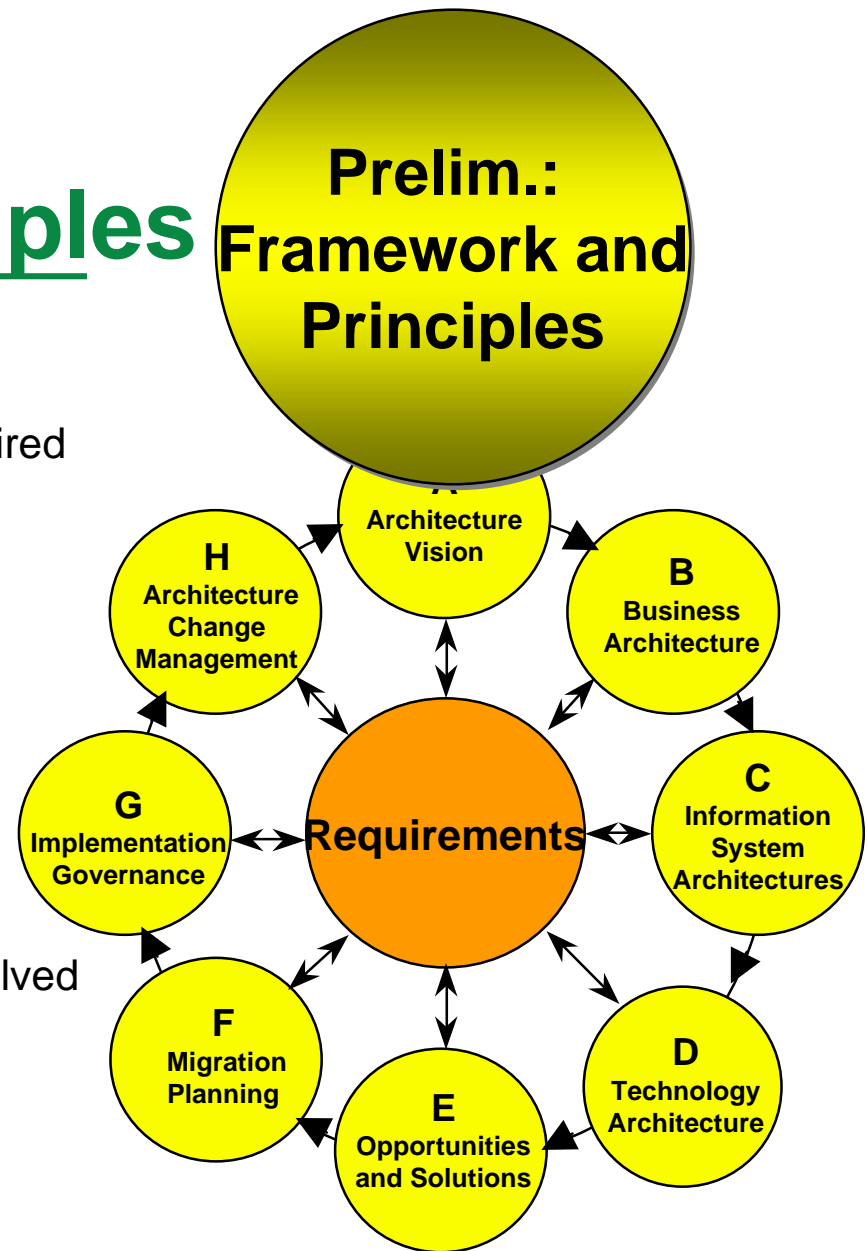
- TOGAF ADM
- Other architecture framework(s), if required
- Business Strategy, Business Principles, Business Goals, Business Drivers
- IT Governance Strategy
- Architecture Principles

□ Steps

- TOGAF ADM a generic method -- not practical to define specific steps for adapting.
- ADM Introduction discusses issues involved and gives general guidelines.

□ Outputs

- Framework Definition
- Architecture Principles
- Restatement of Business Strategy, Principles, Goals, Drivers



Phase A: Architecture Vision

Inputs

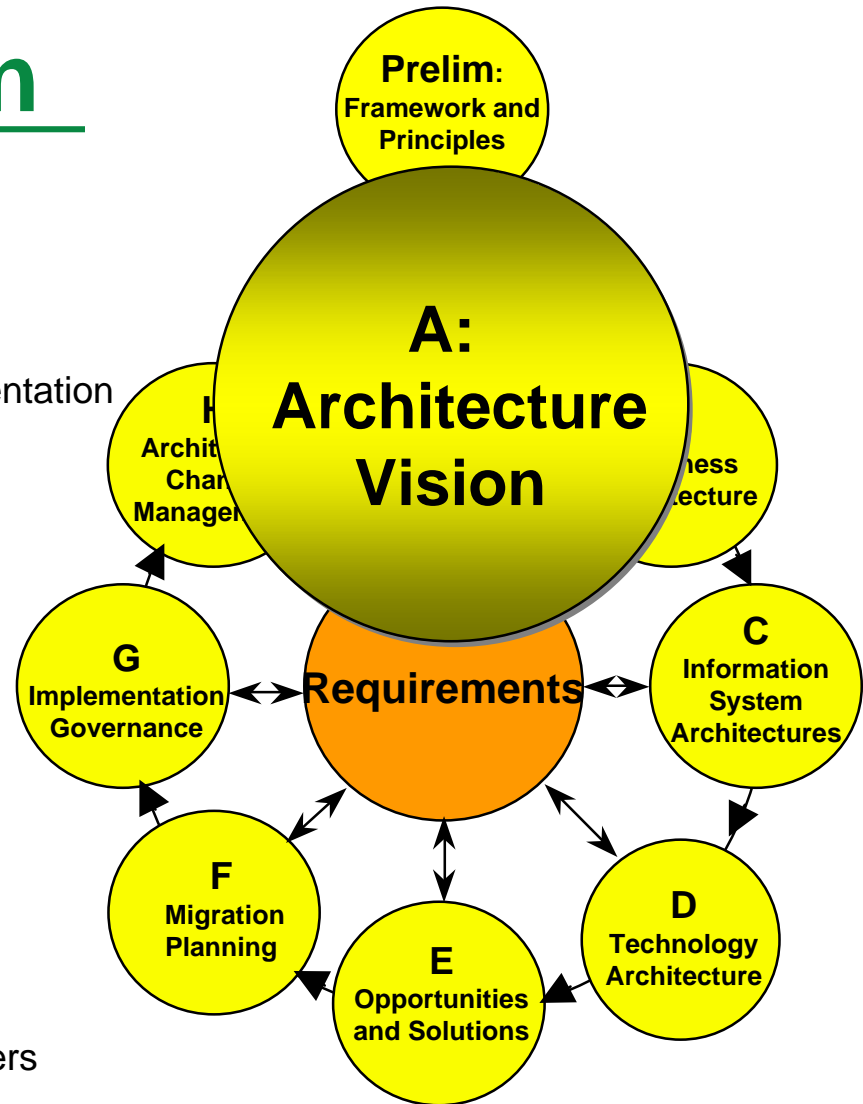
- Request for Architecture Work
- Business Strategy, Principles, Goals, Drivers
- Architecture Principles
- Enterprise Continuum - existing arch. documentation

Steps

- Project Establishment
- Business Principles, Goals and Drivers
- Architecture Principles.
- Project Scope
- Constraints.
- Stakeholders and concerns, Business Requirements, and Architecture Vision
- Statement of Architecture Work and Approval

Outputs

- Statement of Architecture Work
- Refined statements of Principles, Goals, Drivers
- Architecture Vision
- Business Scenario



Phase B: Business Architecture

Inputs

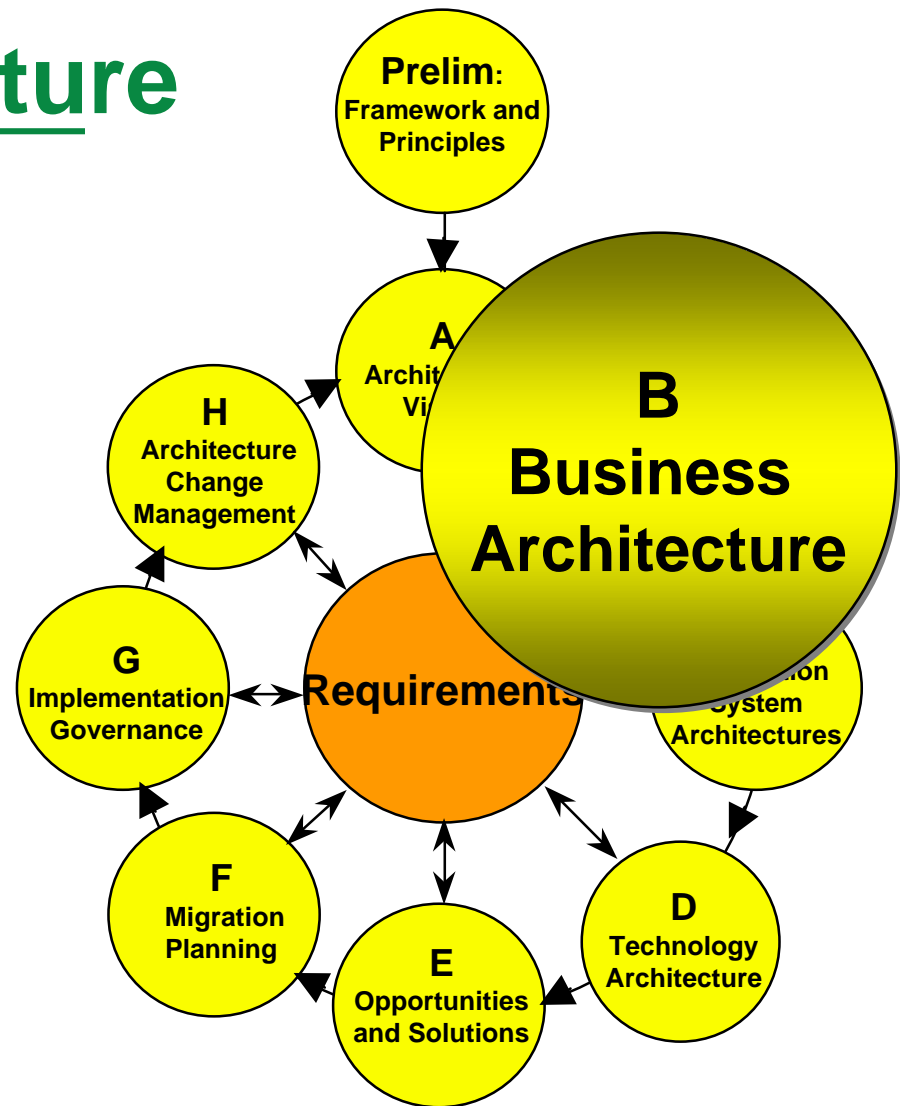
- Request for Architecture Work
- Approved Statement of Architecture Work
- Refined Business Principles, Goals, Drivers
- Enterprise Continuum
- Architecture Vision / Business Scenario

Steps

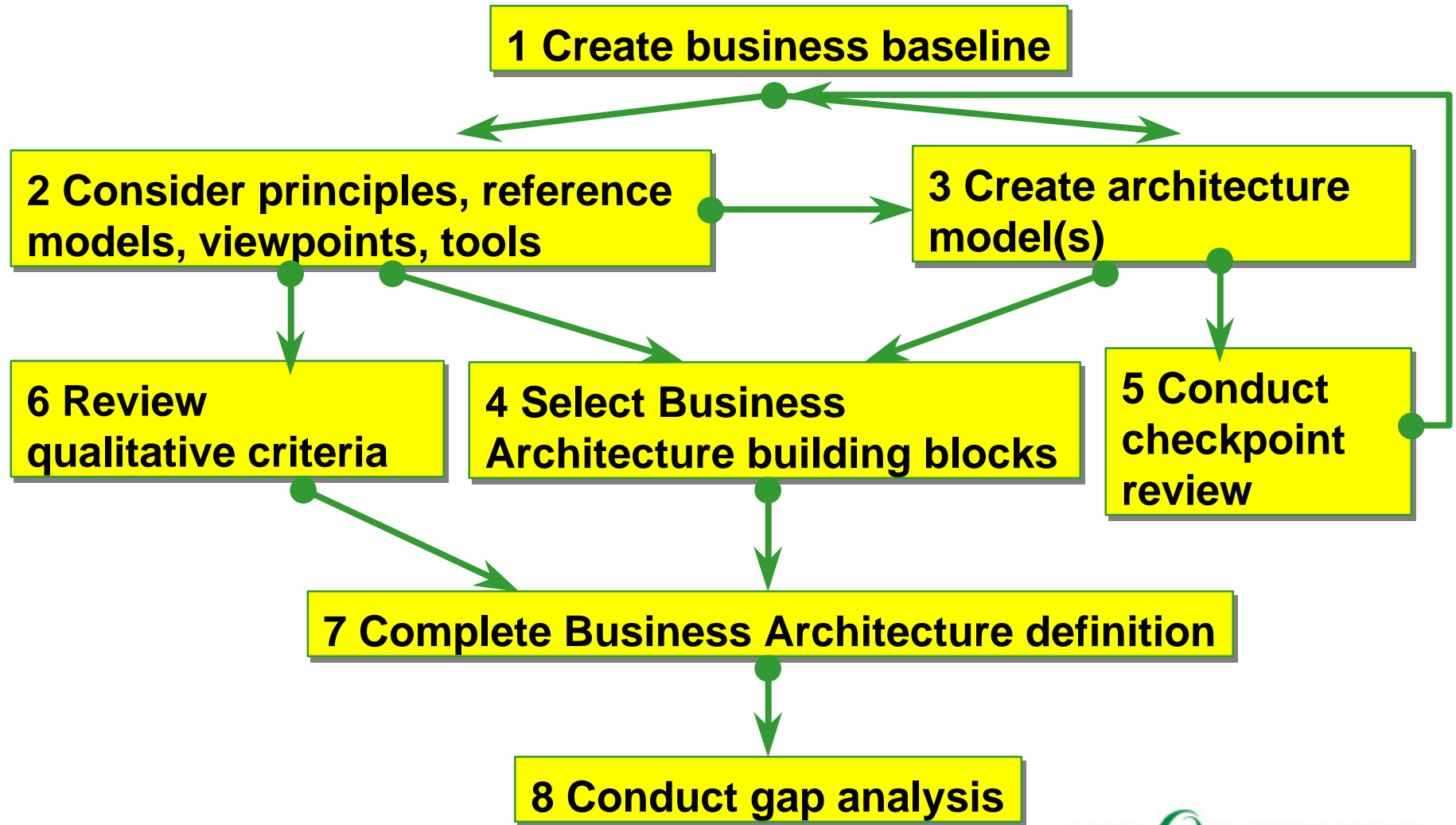
- Detailed steps given separately

Outputs

- Statement of Architecture Work (updated)
- Validated Business Principles, goals, drivers
- Target Business Architecture (detailed)
- Business Baseline (detailed)
- Views addressing key stakeholder concerns
- Gap analysis results
- Technical requirements (drivers for Technical Architecture)
- Business Architecture Report
- Updated business requirements



Phase B – Business Architecture (Steps)

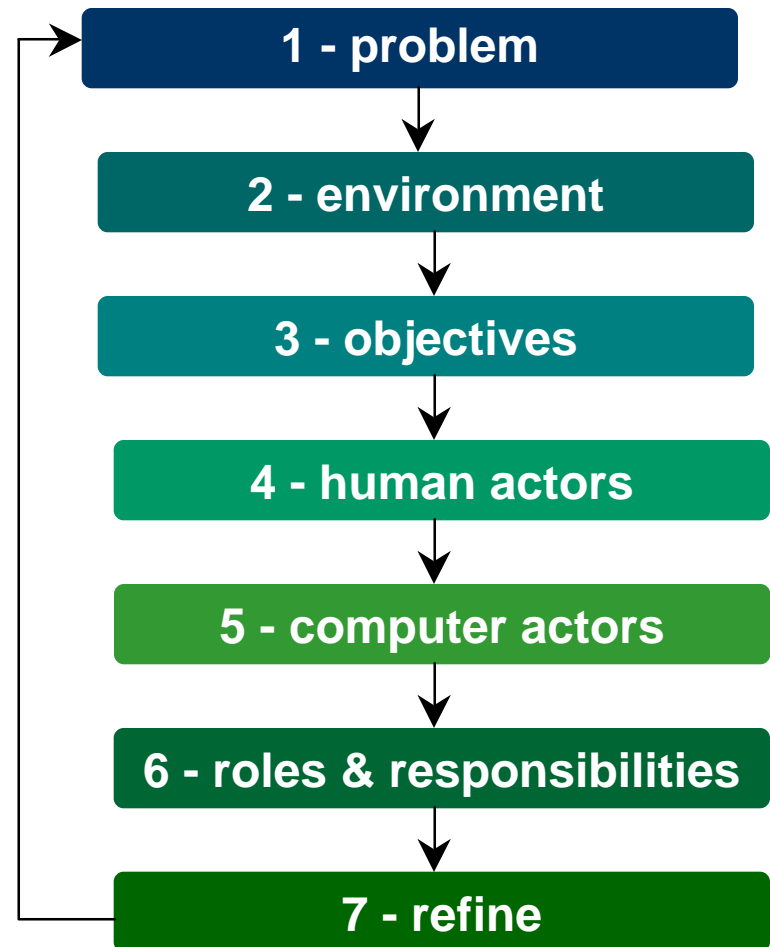


Business Scenarios

- ❑ Used in ADM Phase A (Architecture Vision), and iteratively in Phase B (Business Architecture)
- ❑ A Business Scenario describes
 - a business process, application, or set of applications that can be enabled by the proposed solution
 - the business and technology environment
 - the people and computing components (“actors”)
 - the desired outcome of proper execution
- ❑ A good Business Scenario
 - enables the supply side to understand the value to the buy side of a developed solution
 - is “SMART” (**S**pecific, **M**easurable, **A**ctionable, **R**ealistic, **T**ime-bound)
- ❑ TOGAF ADM defines a method for developing Business Scenarios

Developing a Business Scenario

- 1 - Identify, document and rank the problem driving the scenario
- 2 - Identify business and technical environment where situation is occurring, and document in scenario models
- 3 - Identify and document desired objectives - the results of handling the problems successfully - get SMART
- 4 - Identify human actors, their roles, their place in the business model
- 5 - Identify computer actors (computing elements), their roles, their place in the technology model
- 6 - Identify and document roles, responsibilities, measures of success per actor
- 7 - Check for “fitness for purpose” and refine only if necessary



Phase C: Info. System Architectures

Inputs

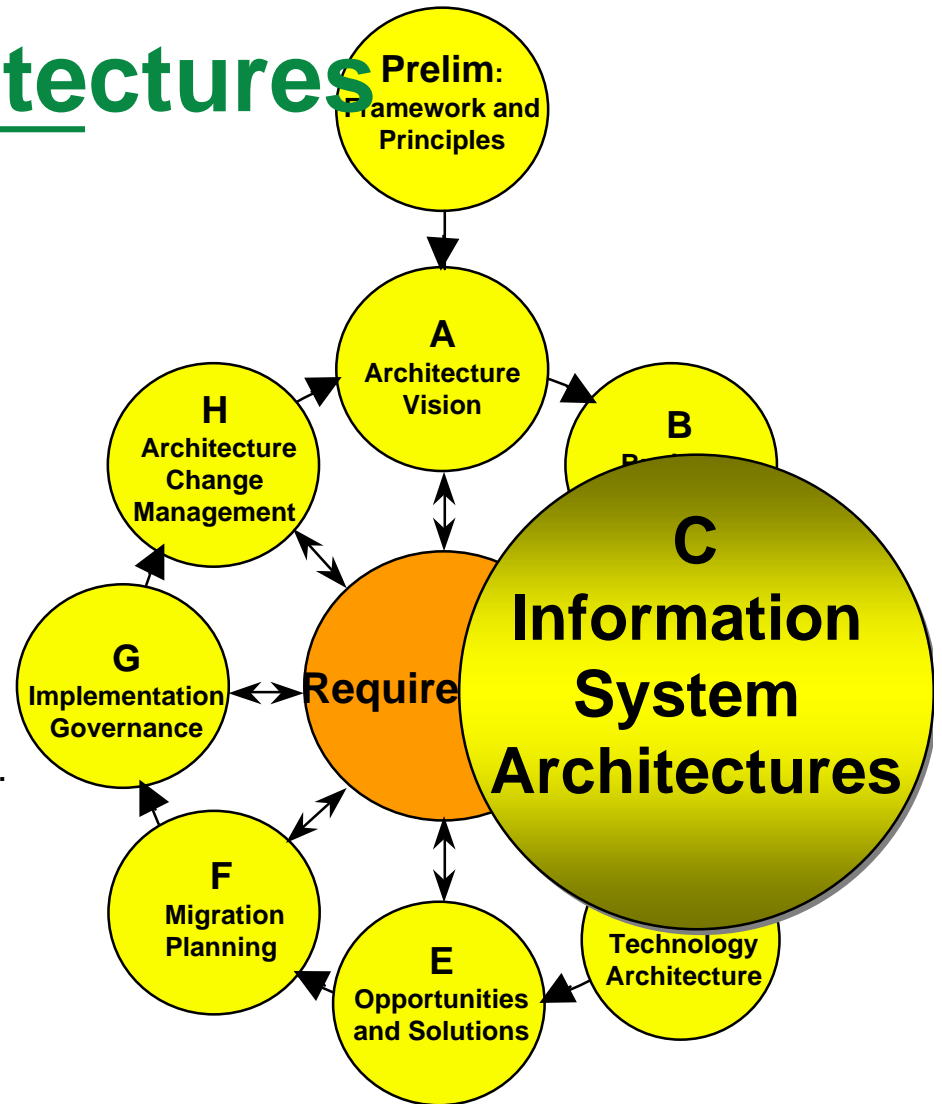
- Applications and Data Principles
- Request for Architecture Work
- Statement of Architecture Work
- Architecture Vision
- Business Baseline
- Target Business Architecture
- Relevant technical requirements
- Gap analysis (from Business Architecture)
- Re-usable building blocks

Steps

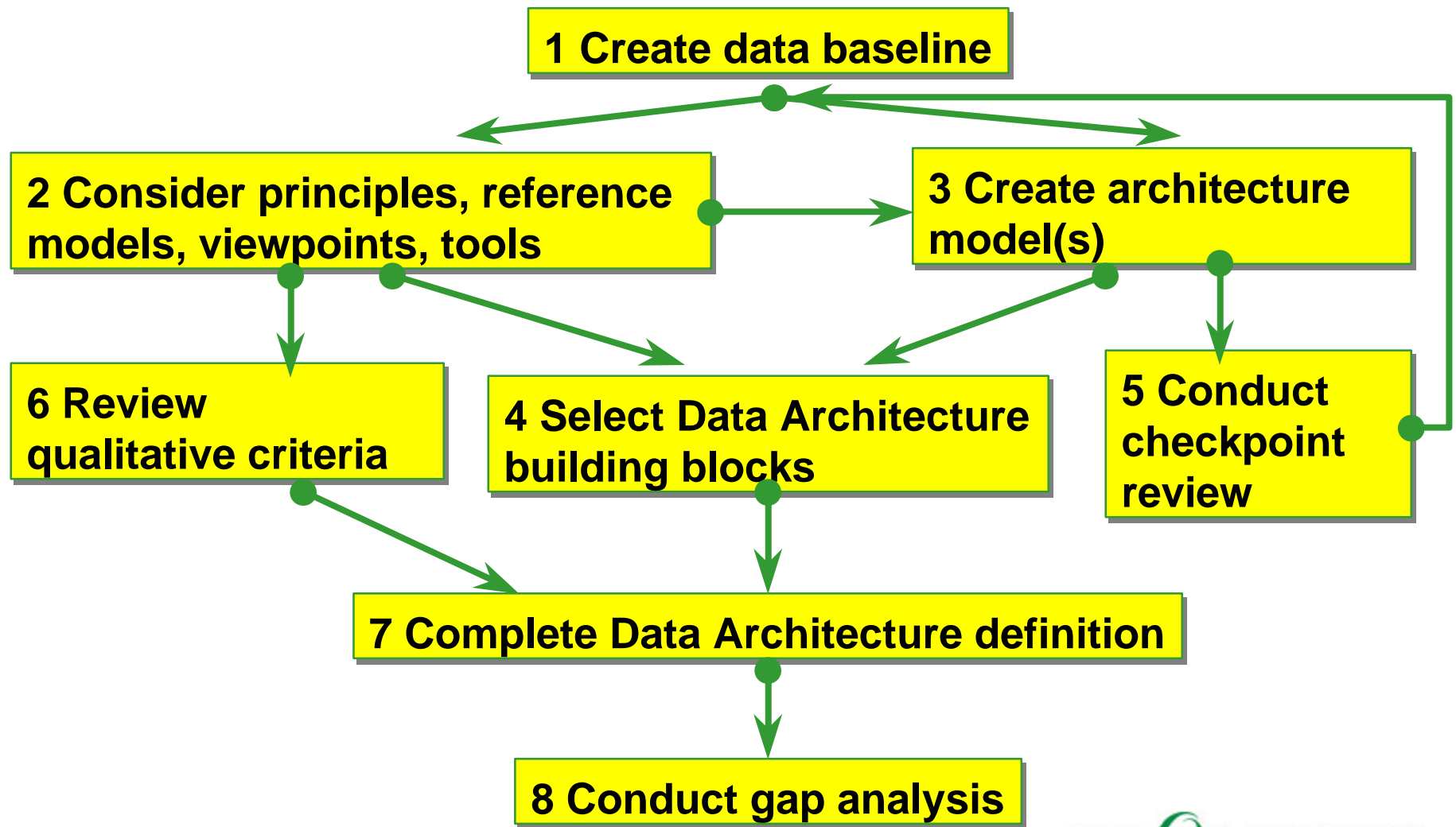
- Detailed steps for Data and Applications Arch.

Outputs

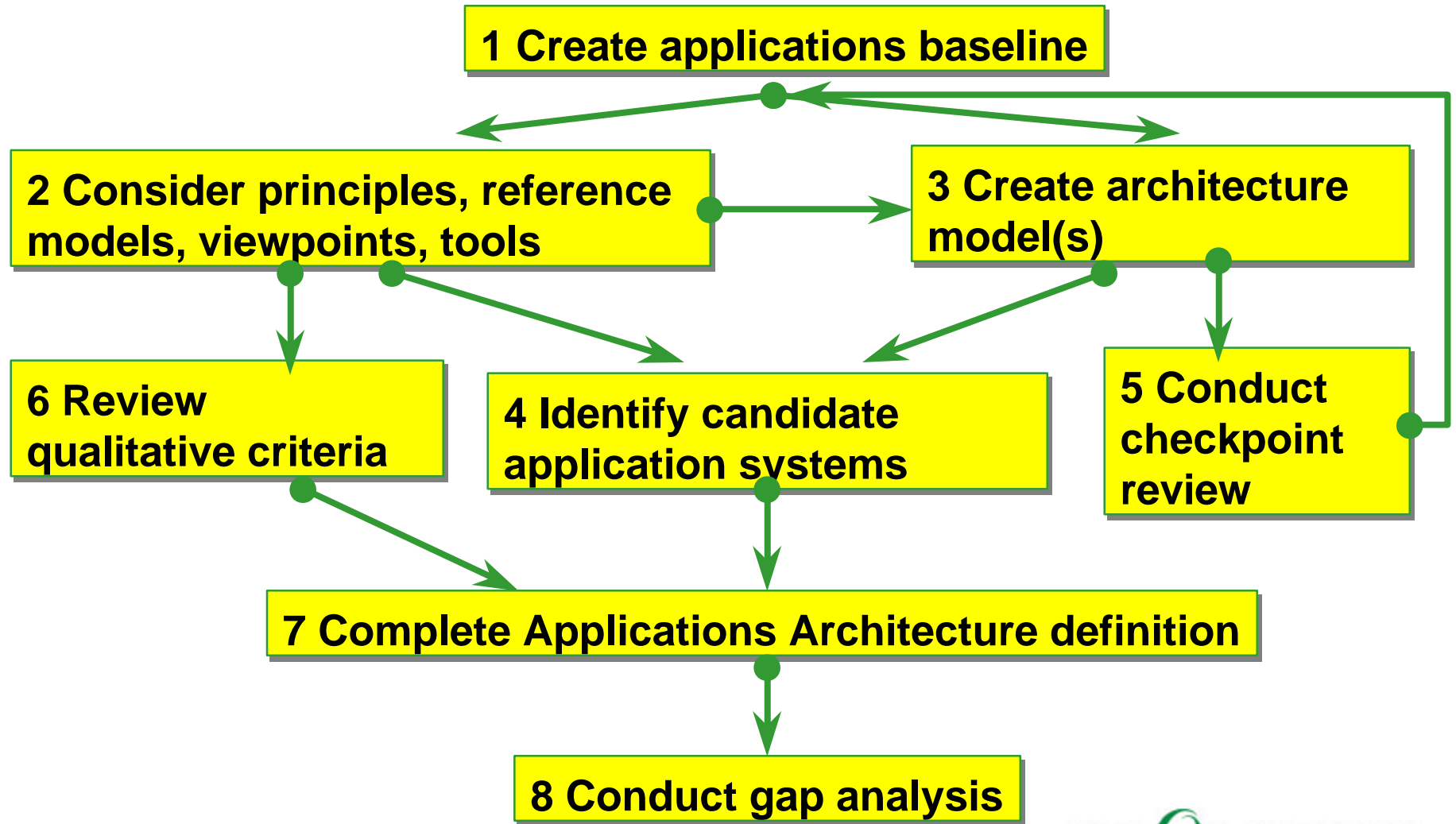
- Statement of Architecture Work (updated)
- Target Data and Applications Architectures
- Data and Applications Architecture Views
- Data and Applications Architecture Reports
- Gap analyses
- Impact Analyses



Phase C – Data Architecture (Steps)



Phase C – Applications Architecture (Steps)



Phase D: Technology Architecture

Inputs

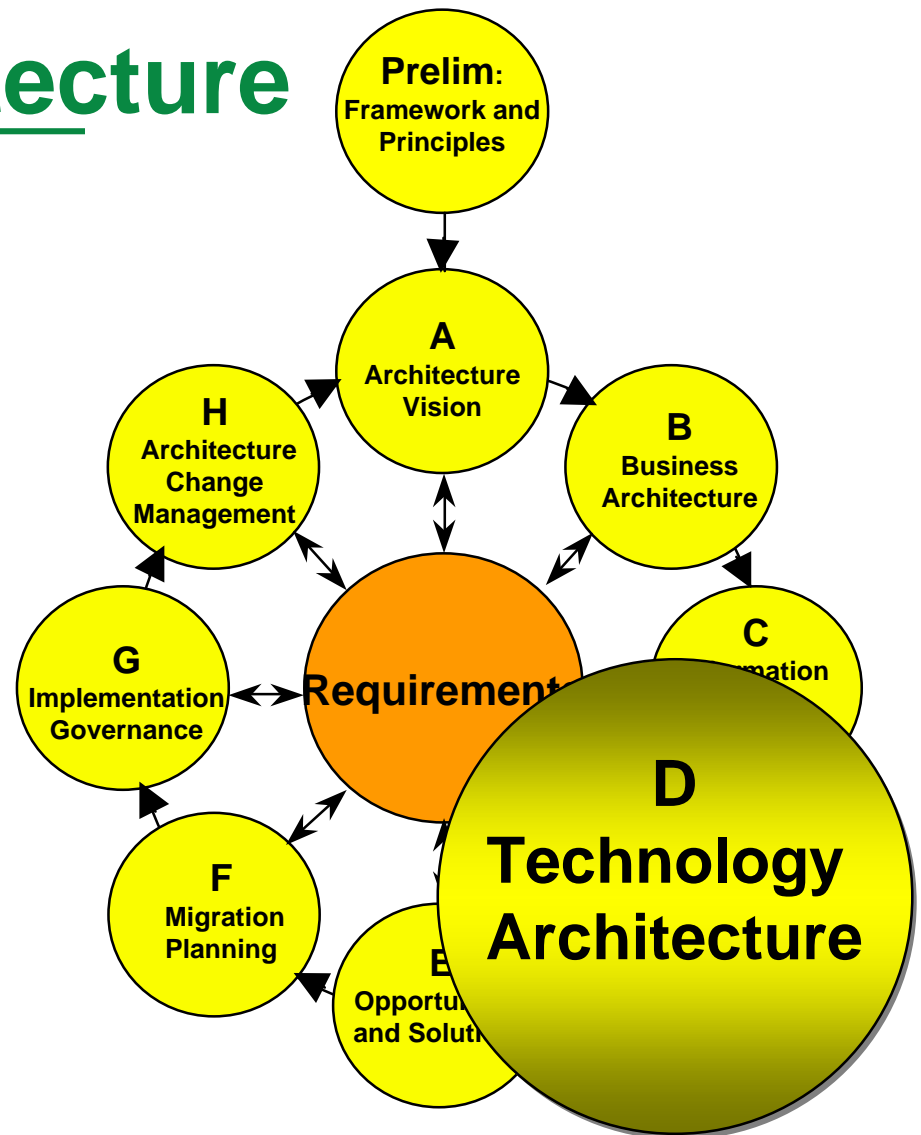
- Technical Principles
- Request for Architecture Work
- Statement of Architecture Work
- Architecture Vision
- Relevant technical requirements (previous phases)
- Gap analyses
- Business, Data and Applications Baselines
- Target Business, Data, Applications Architectures
- Re-usable building blocks

Steps

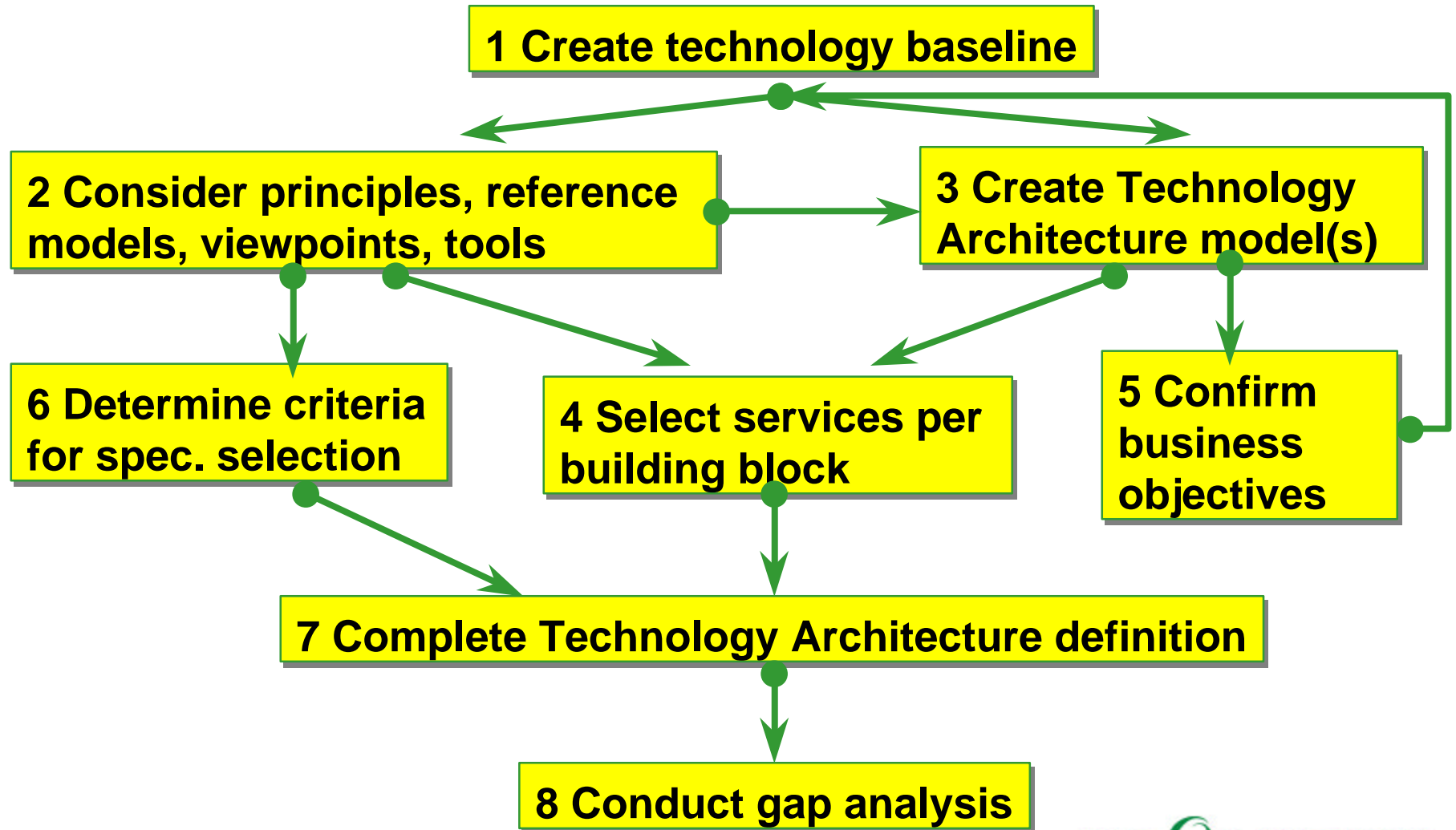
- Detailed steps for Technology Architecture

Outputs

- Statement of Architecture Work (updated)
- Technology Baseline
- Technology Principles
- Technology Architecture Report
- Target Technology Architecture
- Technology Architecture - gap report
- Viewpoints / views addressing stakeholder concerns.



Phase D – Technology Architecture (Steps)



Phase E: Opportunities & Solutions

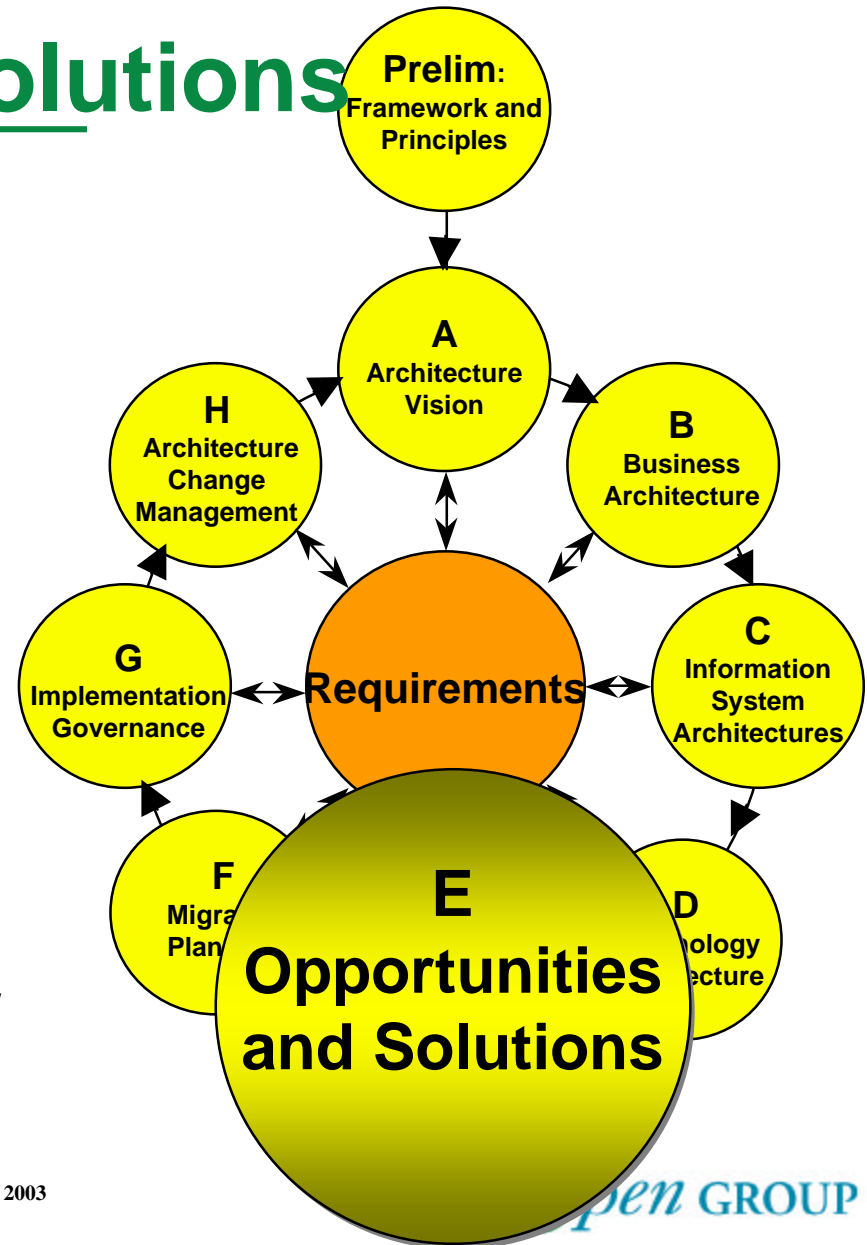
Inputs

- Request for Architecture Work
- Statement of Architecture Work
- Business, Data, Applications, Technology Architectures
- Re-usable architecture building blocks
- Product information

Steps

- Identify business drivers constraining implementation sequence (cost reduction; service consolidation; etc.)
- Review gap analysis generated in Phase D.
- Brainstorm technical requirements
- Brainstorm co-existence, interoperability requirements
- Architecture assessment and gap analysis
- Identify major work packages; classify as new development, purchase opportunity, reuse of existing system.

Outputs



Phase F: Migration Planning

Inputs

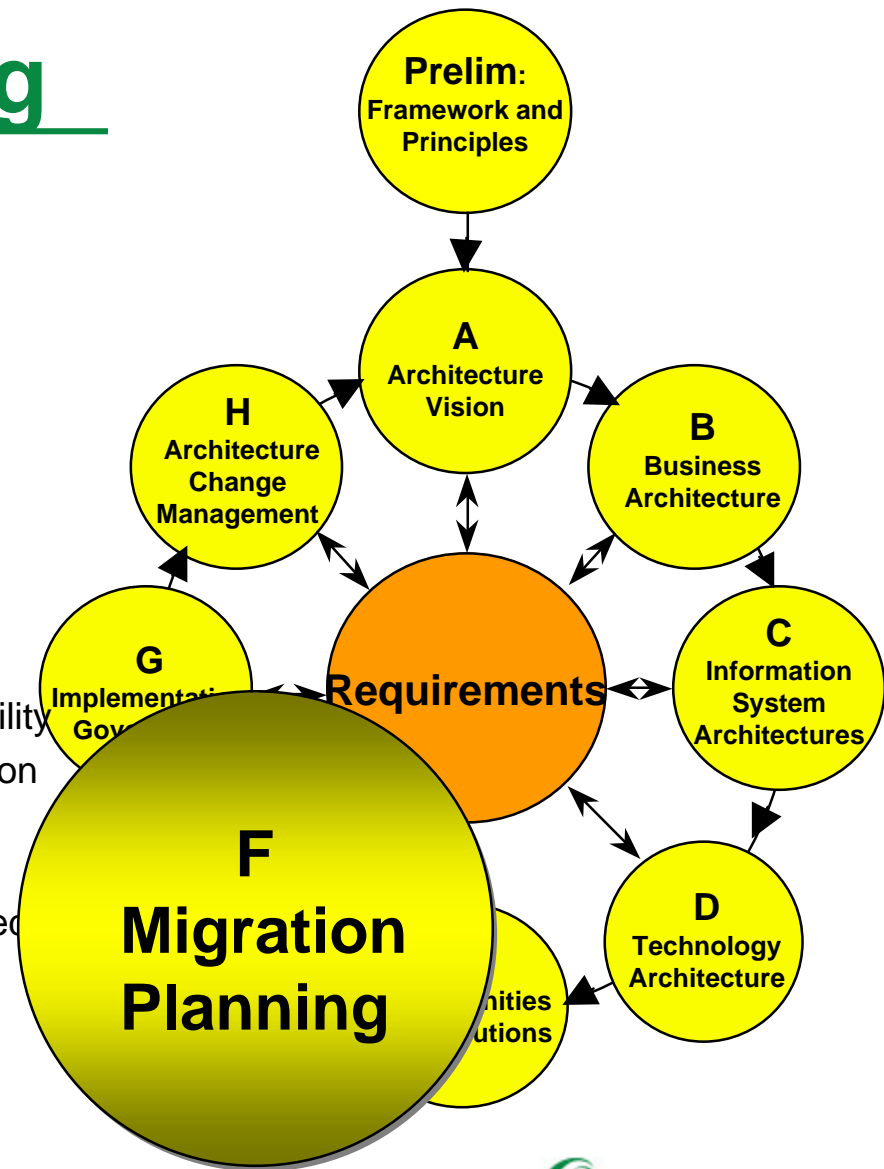
- Request for Architecture Work
- Statement of Architecture Work
- Business Architecture
- Data Architecture
- Applications Architecture
- Technology Architecture
- Impact Analysis - Project list

Steps

- Prioritize projects
- Estimate resource requirements and availability
- Perform cost / benefit assessment of migration projects
- Perform risk assessment
- Generate implementation roadmap (time-lined)
- Document the Migration Plan

Outputs

- Impact Analysis - Migration Plan



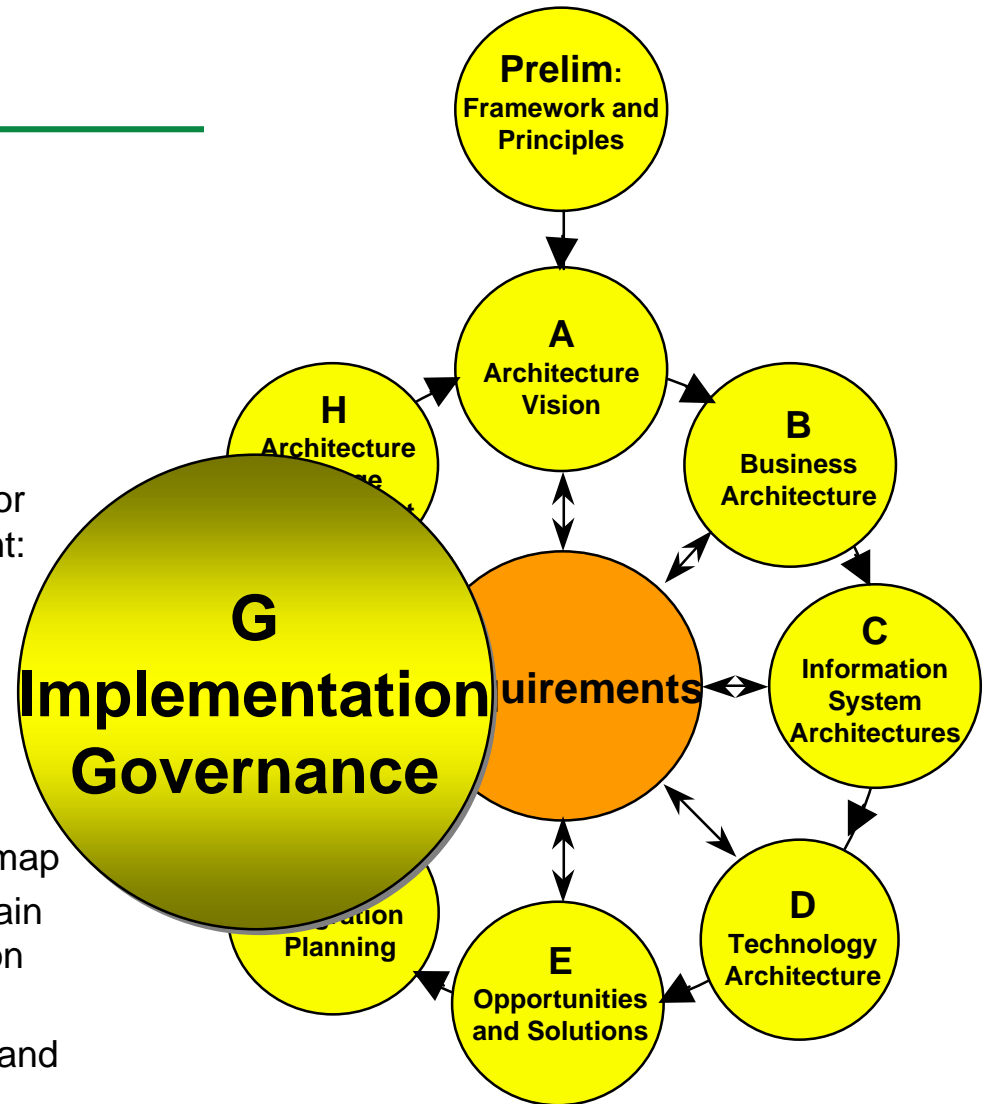
Phase G: Implementation Governance

Inputs

- Request for Architecture Work
- Statement of Architecture Work
- Re-usable solutions building blocks
- Impact Analysis - Migration Plan

Steps

- Formulate project recommendations; for each implementation project, document:
 - scope
 - strategic requirements (from architectural perspective)
 - change requests
 - rules for conformance
 - time-line requirements from roadmap
- Architecture Contract – document, obtain developing and sponsoring organization signatures
- On-going implementation governance and architecture compliance review.



Outputs

23 October 2003

- Impact Analysis - Migration Plan

37

(C) The Open Group 2003

Phase H: Architecture Change Management

Inputs

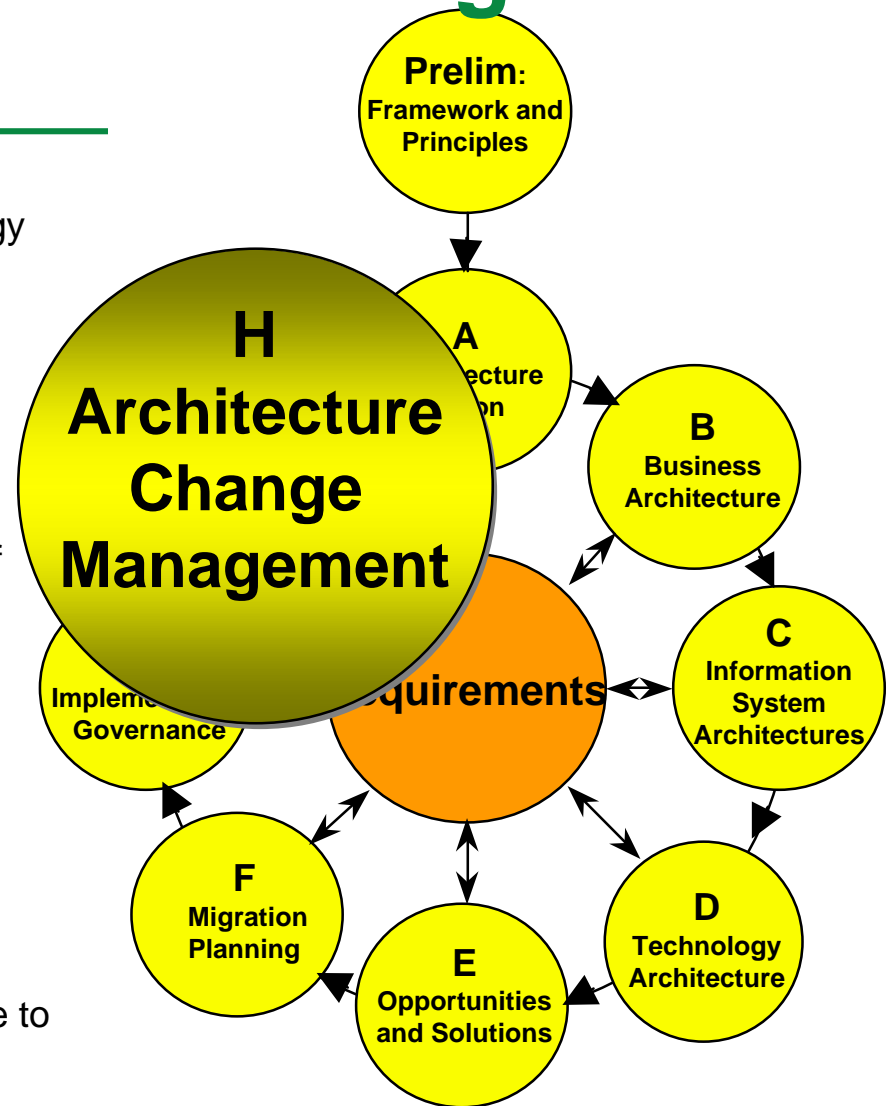
- Request for Architecture Change - technology
- New technology reports
- Request for Architecture Change - business

Steps

- Ongoing monitoring of technology changes
- Ongoing monitoring of business changes
- Assessment of changes and development of position to act
- Meeting of Architecture Board (or other governing council) to decide on handling changes

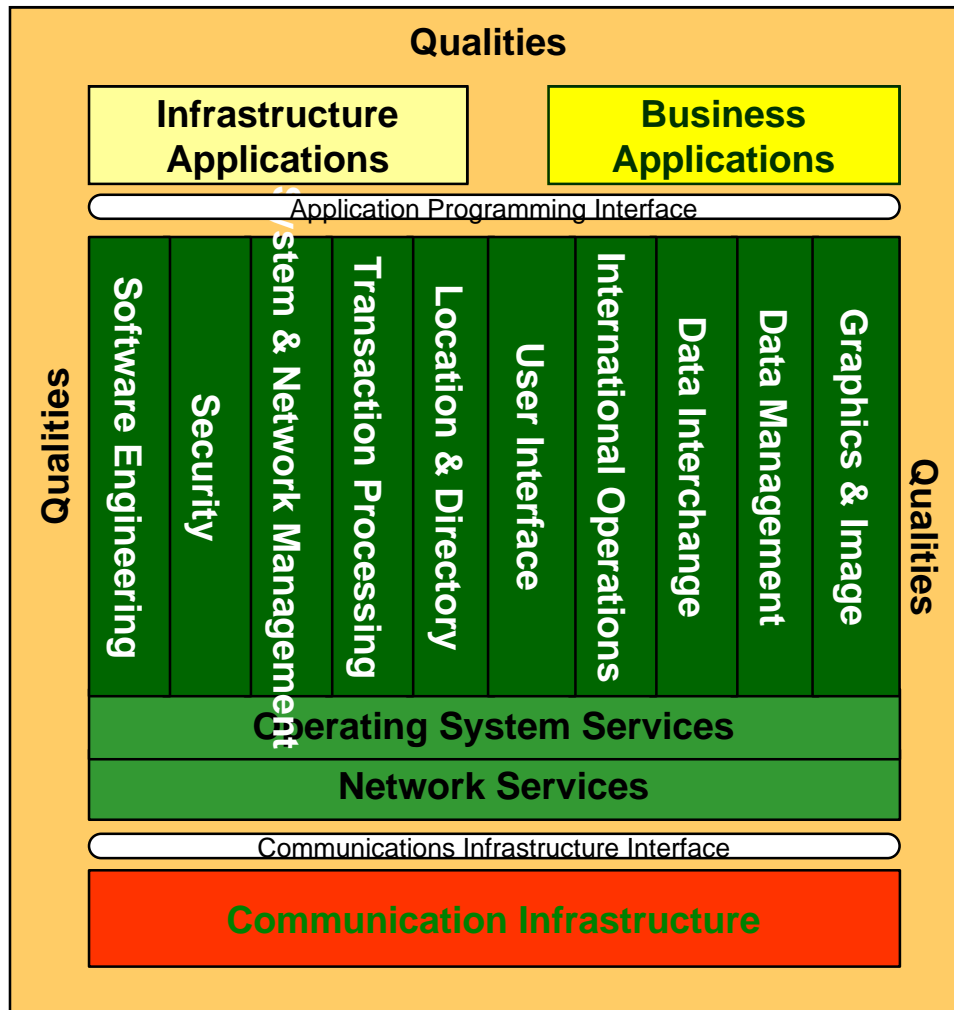
Outputs

- Architecture updates
- Changes to Architecture Framework and Principles
- New Request for Architecture Work (to move to another cycle)



TOGAF “Enterprise Edition” – Reference Models

Foundation Architecture: Technical Reference Model (TRM)



- ❑ Associated with detailed taxonomy of **services**
 - defines scope of each service category
- ❑ Identifies system-wide capabilities or “**qualities**”; e.g.:
 - Internationalization
 - Security
 - Management

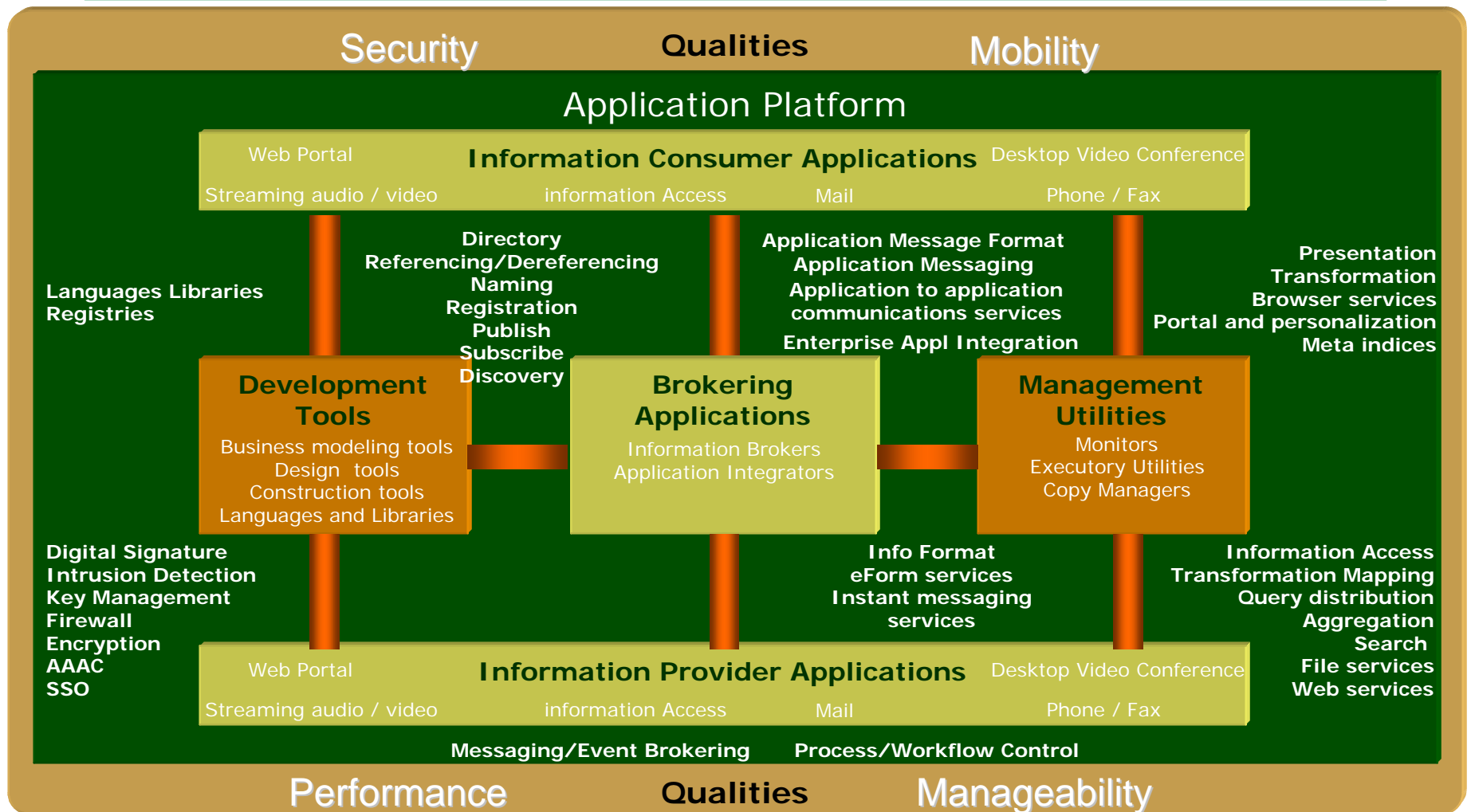
Foundation Architecture: Standards Information Base (SIB)

- ❑ A database of open industry standards
 - The complete set of Open Group endorsed standards
 - Content determined by Open Group consensus process
- ❑ Structured according to TOGAF Technical Reference Model taxonomy
- ❑ Available for public web access
 - <http://www.db.opengroup.org/sib.htm>
- ❑ Gateway to many linked resources

Boundaryless Information Flow Reference Model

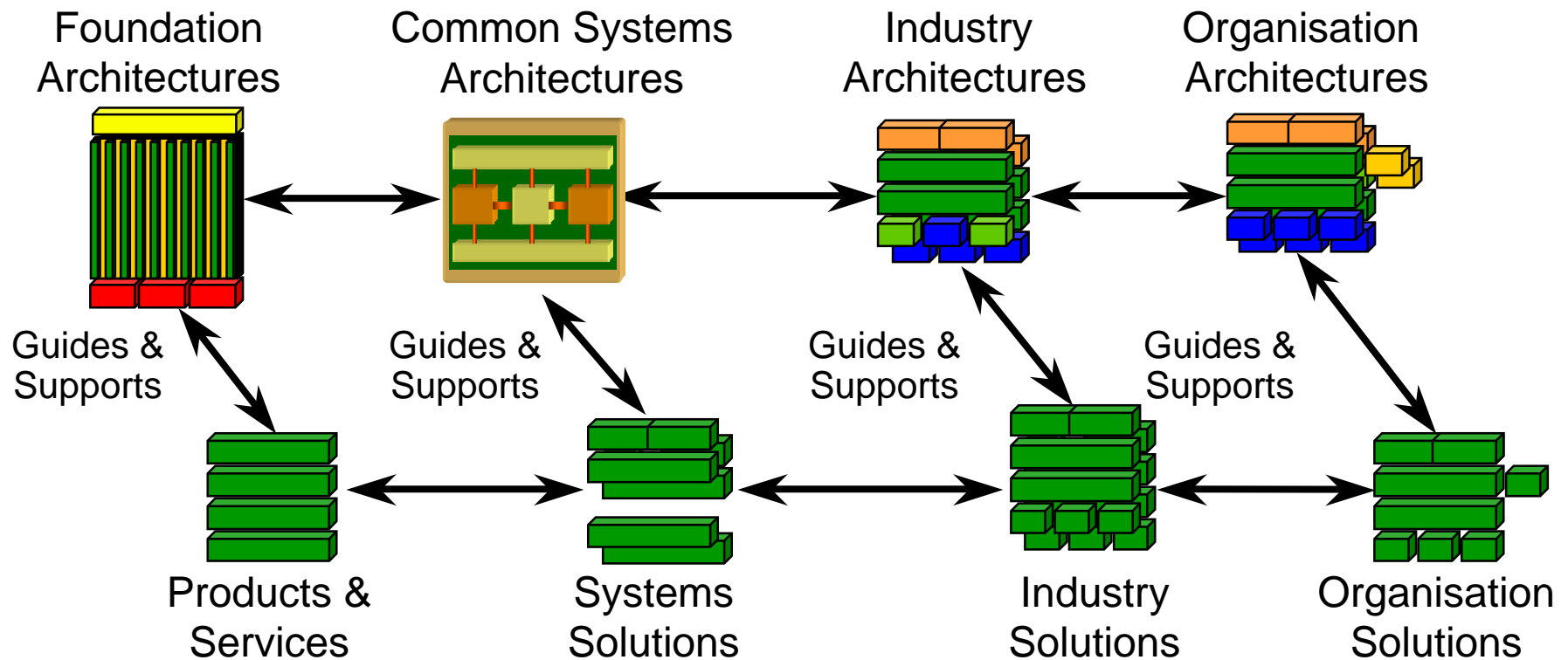
- ❑ A model of the major component categories for developing, managing, and operating an integrated information infrastructure.
- ❑ A model of a set of applications that sit on top of an application platform.
- ❑ An expanded subset of the TOGAF Technical Reference Model, using different orientation.

Boundaryless Information Flow Reference Model – Detailed Model



The “Enterprise Continuum”

Architecture Continuum



Solutions Continuum

Resource Base

- ❑ **Architecture Board:** Guidelines for establishing and operating an Enterprise Architecture Board
- ❑ **Architecture Compliance:** Guidelines and checklists for ensuring project compliance to architecture
- ❑ **Architecture Contracts:** Guidelines for architecture contracts
- ❑ **Architecture Governance:** Arrangements for effective control of IT Architecture by enterprise management
- ❑ **Architecture Patterns:** Guidelines on architecture patterns
- ❑ **Architecture Principles:** Guidelines on developing Architecture Principles; and a generic set of Architecture Principles
- ❑ **Architecture Views:** Guidelines for developing viewpoints and views in architecture models
- ❑ **Building Blocks Example:** Example illustrating use of building blocks in architecture

Resource Base (continued)

- ❑ **Business Process Domain Views:** A set of function views aligned with the business process structure of the enterprise
- ❑ **Business Scenarios:** A method for deriving business requirements for architecture and the implied technical requirements
- ❑ **Case Studies:** Real-life examples of TOGAF in use
- ❑ **Glossary:** Definitions of key terms
- ❑ **Other Architectures / Frameworks:** and relationship to TOGAF
- ❑ **Tools for Architecture Development:** Generic evaluation criteria for architecture tools
- ❑ **Zachman Framework mapping:** Mapping the TOGAF ADM to the Zachman Framework

TOGAF Version 8 Summary

- ❑ An effective, industry standard framework and method for enterprise architecture.
- ❑ Complementary to, not competing with, other enterprise frameworks
 - Use in conjunction with frameworks with deliverables specific to particular sectors.
 - TOGAF and....
- ❑ A repository of best practice
 - “Demystifies” architecture development
- ❑ Emphasizes business goals as architecture drivers
- ❑ A framework and method for achieving the “Boundaryless Information Flow” vision

Recent Developments

- ❑ Sun Microsystems is incorporating TOGAF into a composite best-of-breed of EA frameworks
- ❑ Raytheon is integrating TOGAF into its REAP methodology
- ❑ HP's internal IT is using TOGAF
- ❑ TOGAF is supported in the Popkin and Metis architecture tools

Plans for the Future

Plans for the Future - TOGAF 8.1

- Architecture Governance
 - New, structured section on Architecture Governance, comprising three subsections:
 - Introduction to Architecture Governance
 - Architecture Governance Framework
 - Architecture Governance in Practice
- Architecture Maturity Models
 - New section on Architecture Maturity Models
- Architecture Skills
 - New section on TOGAF Architecture Skills Framework
- Requirements management
 - New section describing Requirements Management process at center of ADM lifecycle diagram

Plans for the Future - TOGAF 9+

- ❑ Building on 8.1 additions
- ❑ Boundaryless Information Flow
- ❑ Enterprise Continuum
- ❑ Integrating TOGAF with DSDM: Architecture Implementation
- ❑ Integrating TOGAF with OMG-MDA
- ❑ IT Architect Certification
- ❑ TOGAF Development Lifecycle

- ❑ **ADM Workshop Thursday p.m.**

Summary

- ❑ Adopt and use TOGAF
 - “Demystifies” and speeds up architecture development
 - Faster response to evolving business needs
 - More flexibility to introduce new technology
 - Faster, simpler, cheaper procurement
 - Faster time-to-market
 - Vendor, tool, and technology neutral

- ❑ Participate in the Architecture Forum
 - Worldwide forum for architecture practitioners
 - Help further the development of IT Architecture as a discipline
 - Contribute to / leverage work in progress
 - Network with peers and industry experts

For More Information . . .

- ❑ The Architecture Forum:
 - <http://www.opengroup.org/architecture/>
- ❑ Viewing TOGAF on-line:
 - TOGAF Version 8:
 - <http://www.opengroup.org/architecture/togaf8-doc/arch/>
 - TOGAF Version 7:
 - <http://www.opengroup.org/architecture/togaf7-doc/arch/>
- ❑ TOGAF licensing and downloads:
 - TOGAF Version 8:
 - <http://www.opengroup.org/architecture/togaf8/index8.htm>
 - TOGAF Version 7:
 - <http://www.opengroup.org/architecture/togaf7/index7.htm>