



IBM Software Group

System Architect and TOGAF 9

John MacLeod

Rational software



System Architect and TOGAF 9

- What is EA
- Why do Enterprise Architecture
 - ▶ The role and reason for TOGAF 9
- Overview of System Architect
 - ▶ In the context of TOGAF 9
- Overview of TOGAF 9
- Break
- TOGAF 9 within System Architect
 - ▶ Definitions, Diagrams, Viewpoints, Matrices...
- The future of TOGAF 9 with IBM Rational
- Next steps

TOGAF
Version 9 Enterprise Edition



What is EA (a recap)



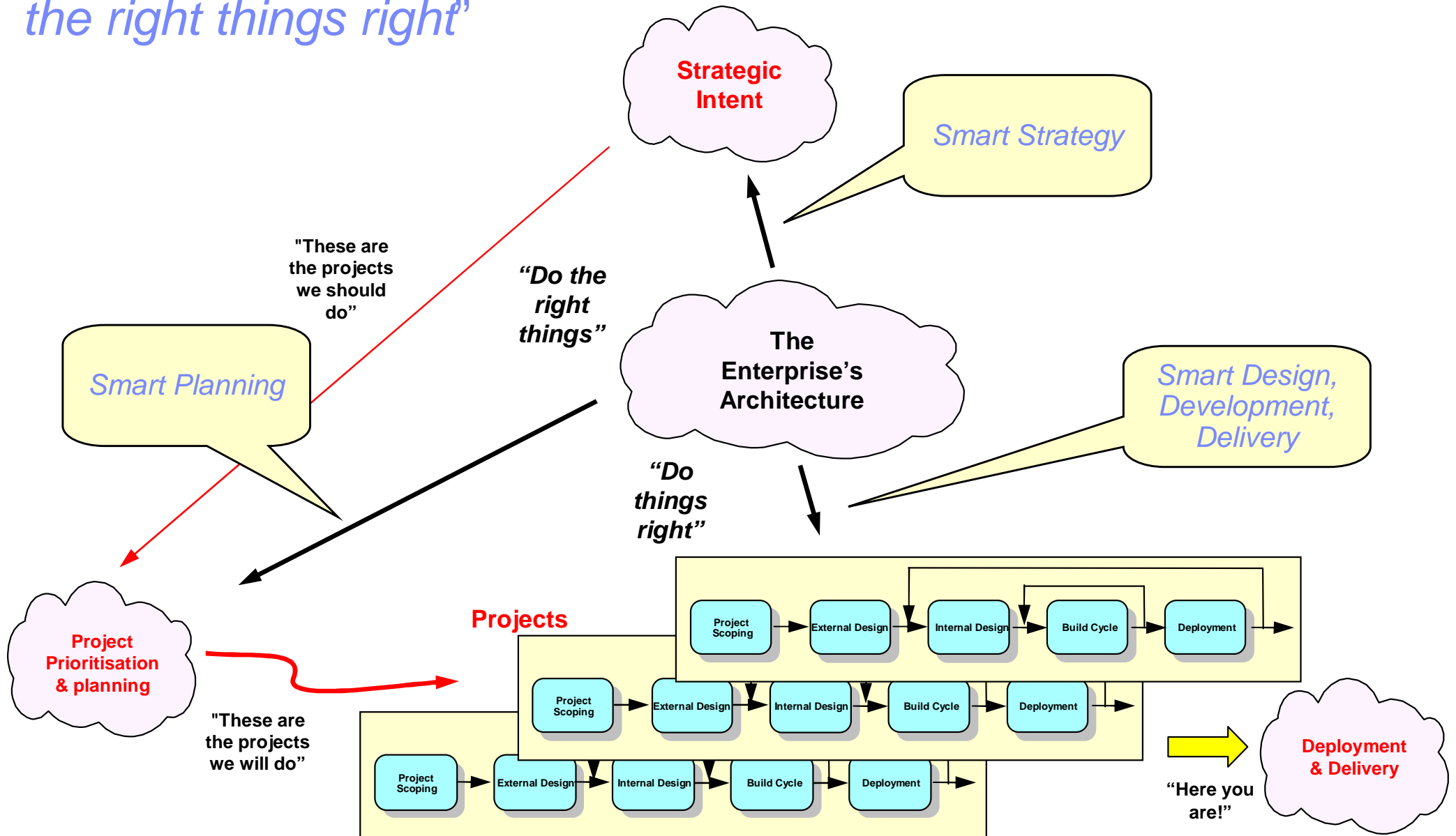
What is Enterprise Architecture?

■ Enterprise Architecture

- ▶ *“An architectural discipline that merges strategic (business and IT) objectives with opportunities for change and governs the resulting change initiatives”*
- ▶ Driving portfolio planning in a strategic context and directing change toward common enterprise goals
 - *Doing the right things*
 - *Making sure things are done right*
- ▶ The term “Enterprise” is flexible!



Or, more completely, architecture enables organisations to “do the right things right”



So how do we do it? How *should* we do it?

Firstly, by recognising two aspects of “architecture”

There are two styles of Architect behaviour

- Those who take a *holistic, wide approach*, wanting to define, explore, adjust and analyse from all points of view

“I need to see/work on something of everything”

Enterprise
Architecture

- Those who have a detailed, specialised focus on some aspect
 - requirements, functional structure, operational deployment etc.

“I need to see/work on everything of something”

Solution Design

In some contexts these two styles are distinguished as

- Architects – think of the whole thing in a holistic way
- Designers – focus their specialised skills on a specific aspect or part of the thing



So how do we do it? How *should* we do it?

Secondly, by recognising two types of content

There are two sorts of content, for **BOTH** styles of behaviour

- ▶ **System¹ Modelling** - describing the requirements on, and design of a *specific* target business system
- ▶ **Patterns, principles and building blocks** – “*best practice*” guidance that constrains these models

We're recognising that our tools can/should serve the needs of both communities, across both sorts of content.

- ▶ Architecture tooling (such as System Architect) supports those architecturally focused and “*need something of everything*”
- ▶ Specialised tooling (such as WBM, RSA and RAM) support those with a solution design focus and “*need everything of something*”



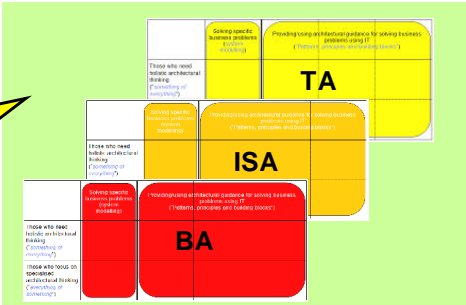
These notions map onto a neat “mental model”...

	Solving specific business problems (system modelling)	Providing/using architectural guidance for solving business problems using IT ("Patterns, principles and building blocks")		
Those who need holistic architectural thinking ("something of everything")				
Those who focus on specialised architectural thinking ("everything of something")				

Solution Design

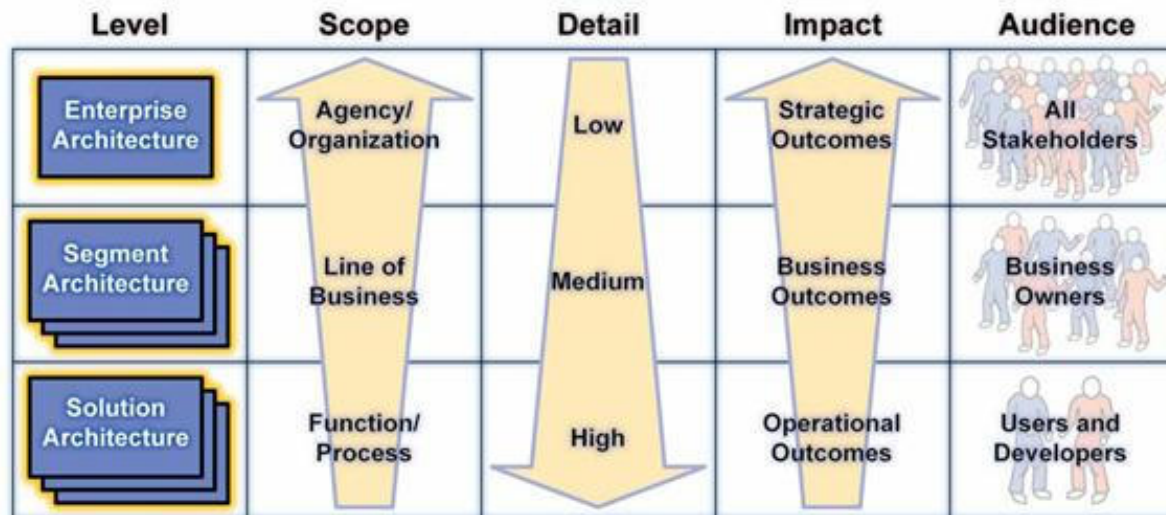
Enterprise Architecture

(Key note: this mental model covers all aspects of architecture - business architecture, information systems architecture, and IT infrastructure architecture!)



Enterprise Architecture vs. Solution Architecture

Enterprise Architecture is the formal organisation (design or layout) of the components, structures and processes required or relevant to the attainment of the goals and visions invested or envisioned in an enterprise.



From US OMB 2006 FEA Practice Guidance

Solution architecture aims to address specific problems and requirements, usually through the design of specific information systems or applications.



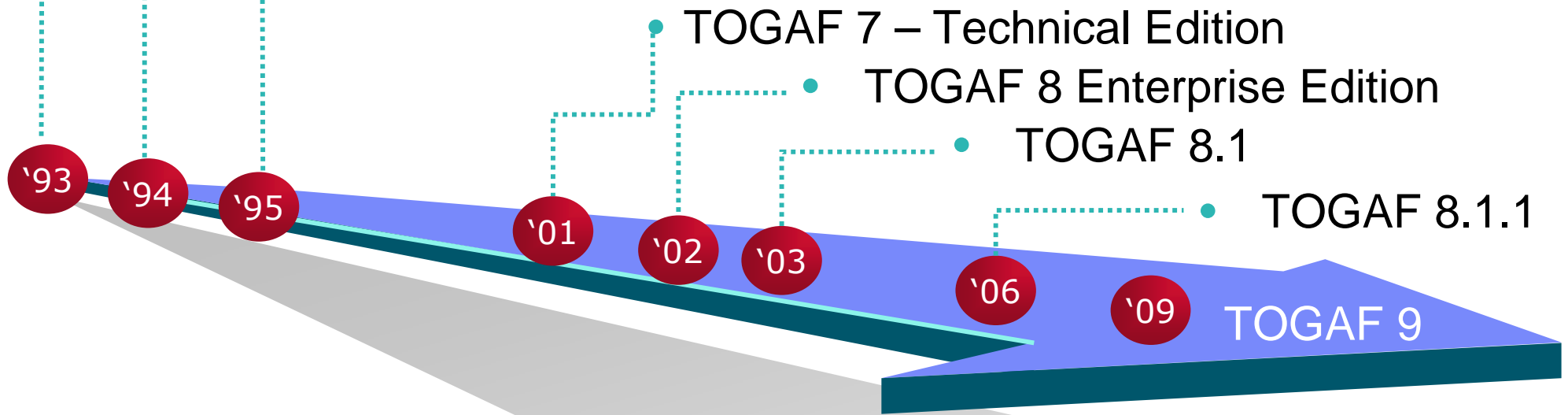
Overview of TOGAF 9

- History
- Architecture Development Method
- Architecture Content Framework
- Architecture Capability Framework



TOGAF – positioning itself the de facto standard for “doing” EA

- Customer members demand architecture standards ...
 - Customer members select TAFIM* as preferred starting point...
 - DoD Information Systems Agency (DISA) donate TAFIM as base
 - TOGAF first published



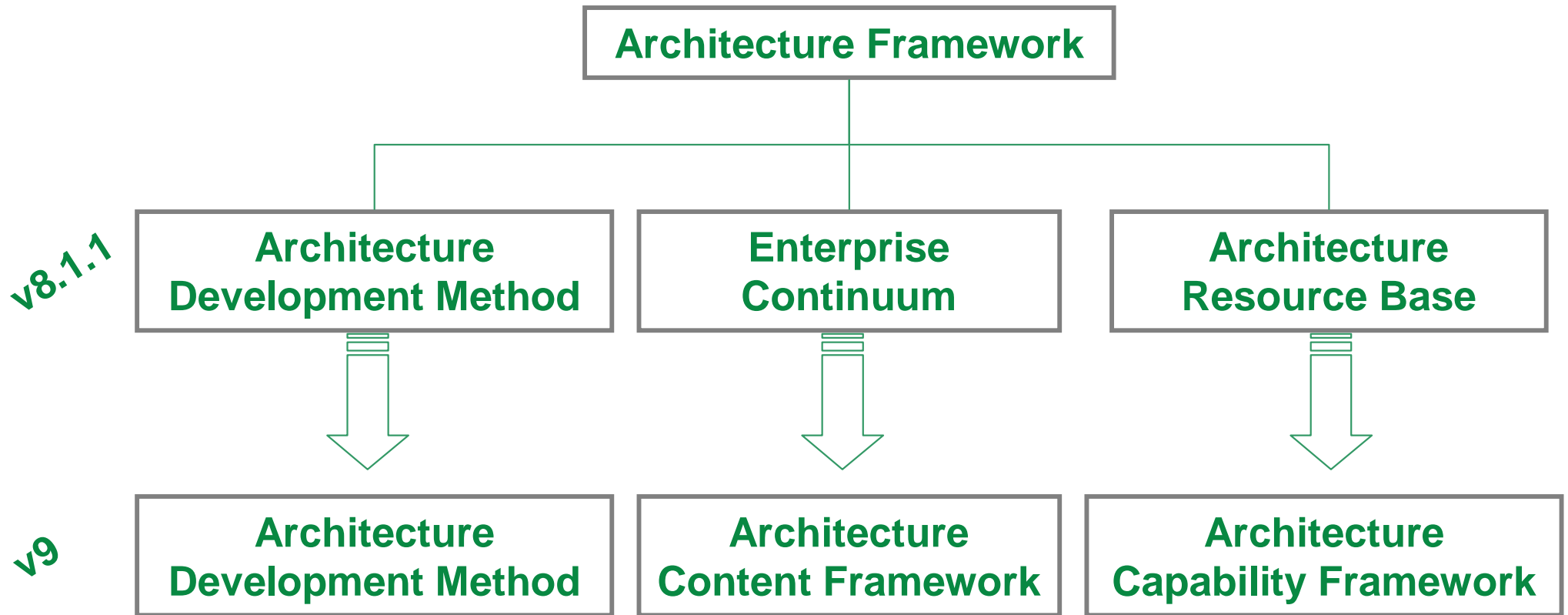
- The Interoperable Enterprise Business Scenario first published

First TOGAF Certification Program Launched

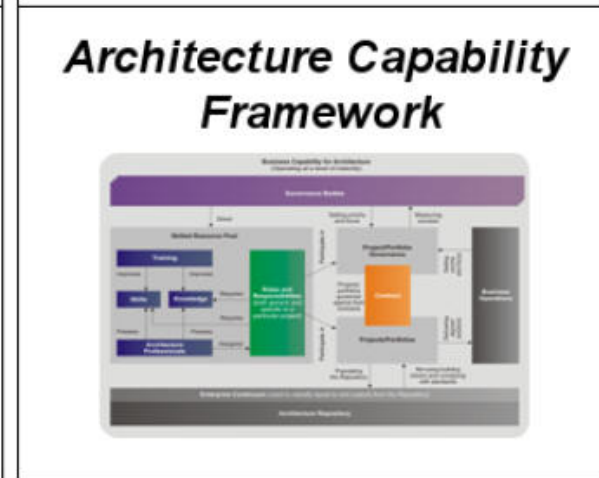
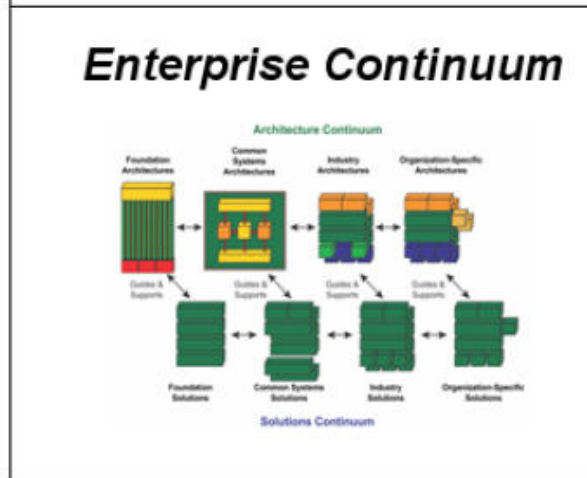
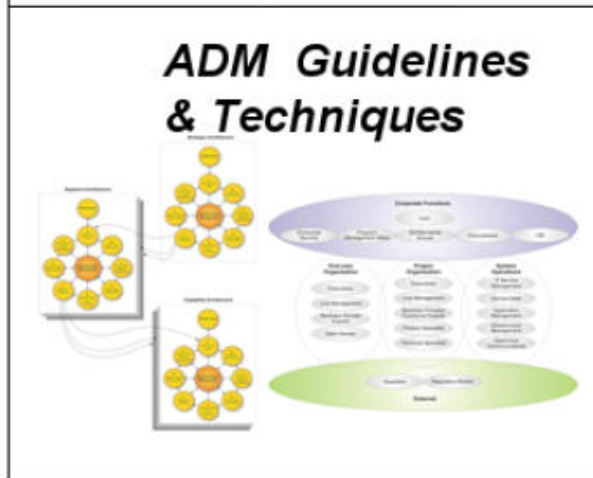
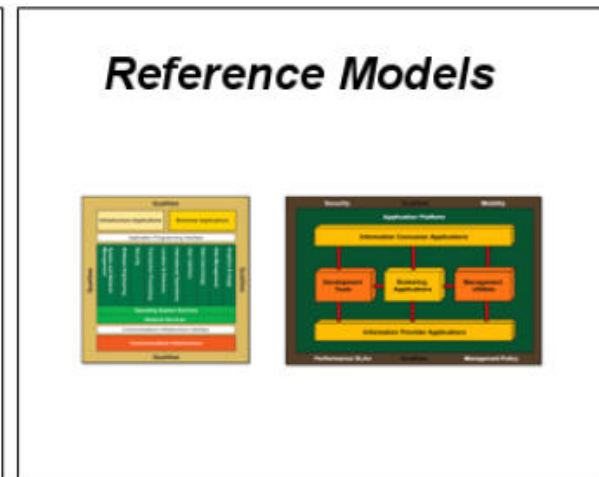
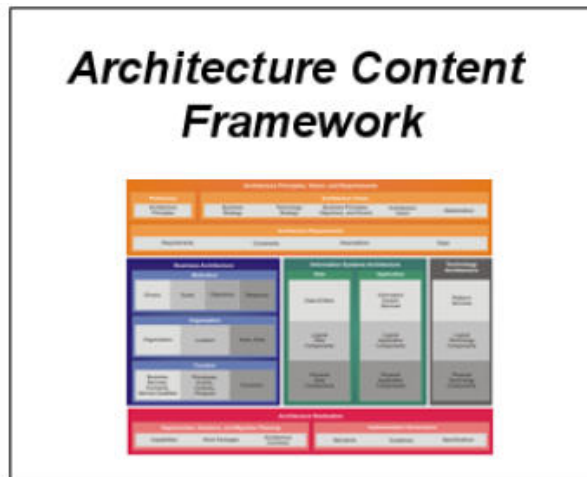
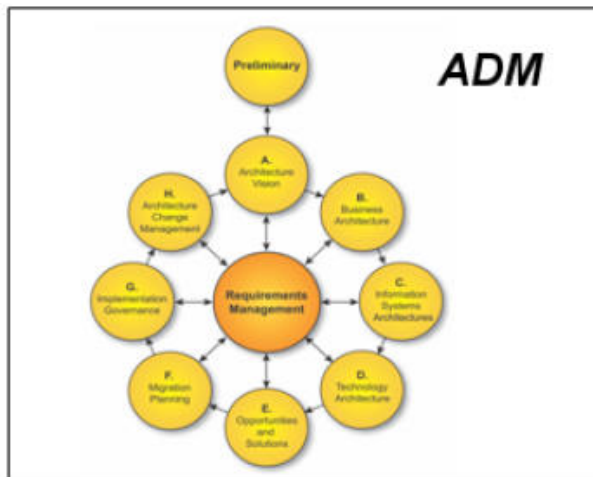
*Technical Architecture Framework for Information Management



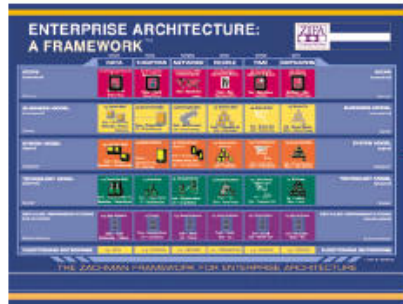
TOGAF 9 -An Architecture Framework



TOGAF 9 Components



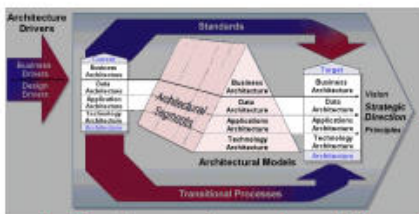
Standalone or Complimentary



Zachman Framework

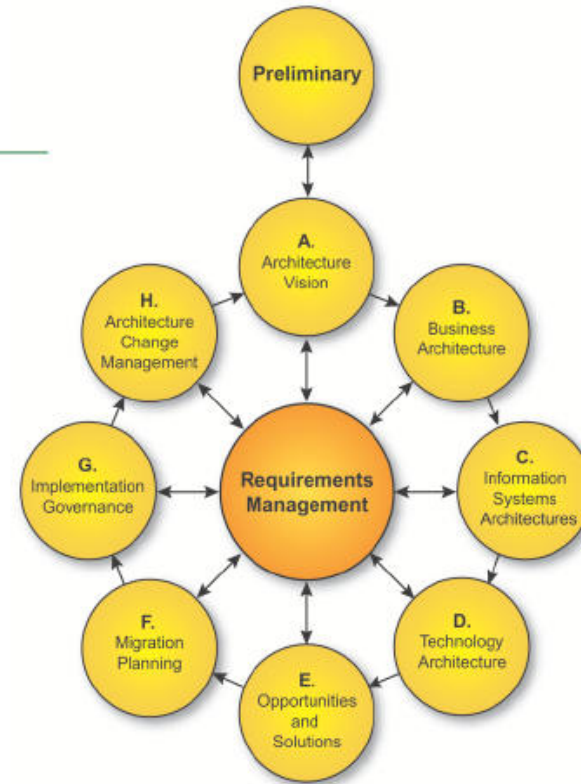


DoD Architecture Framework



Federal Enterprise Architecture Framework

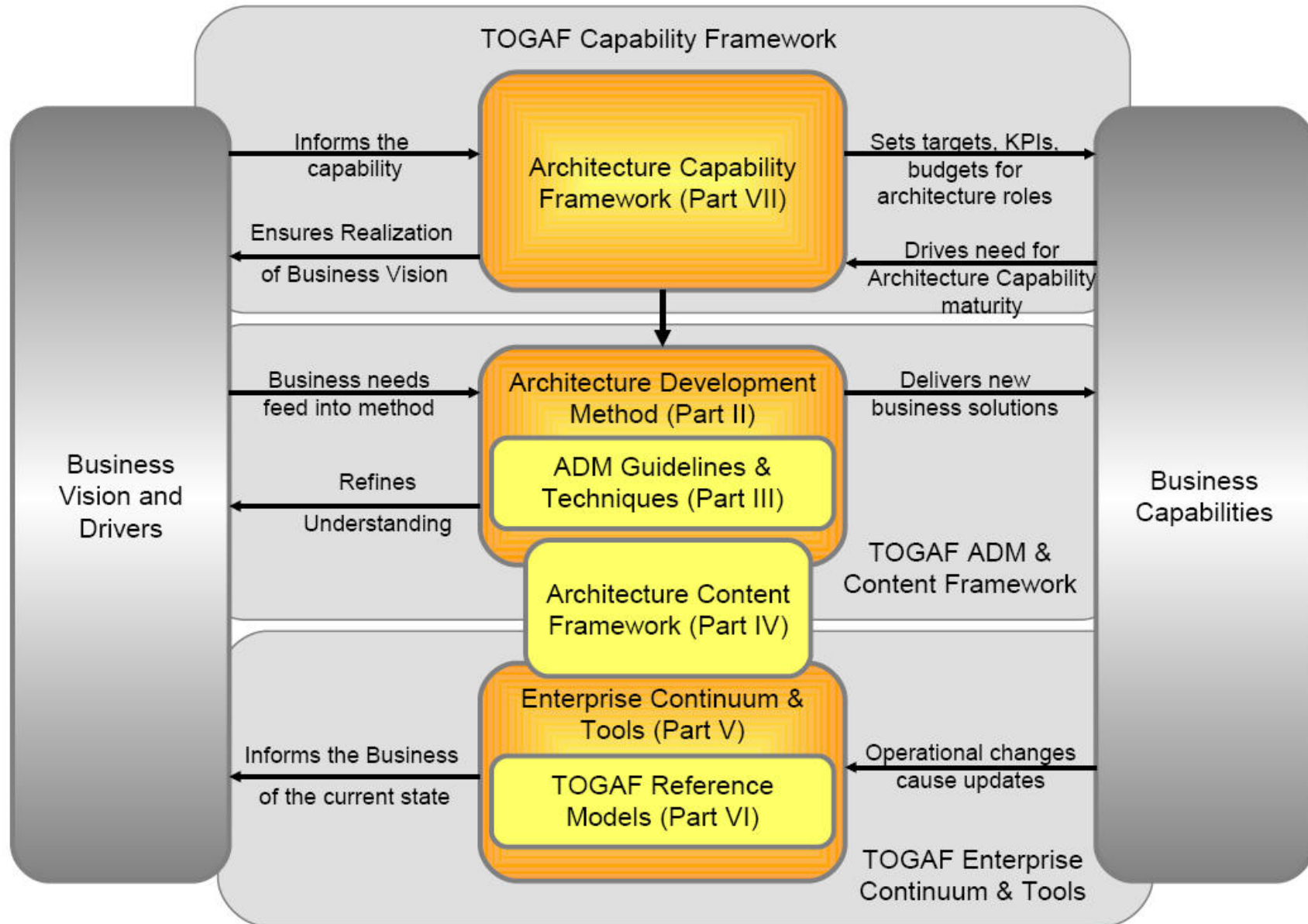
Support or
Guidance



TOGAF 9

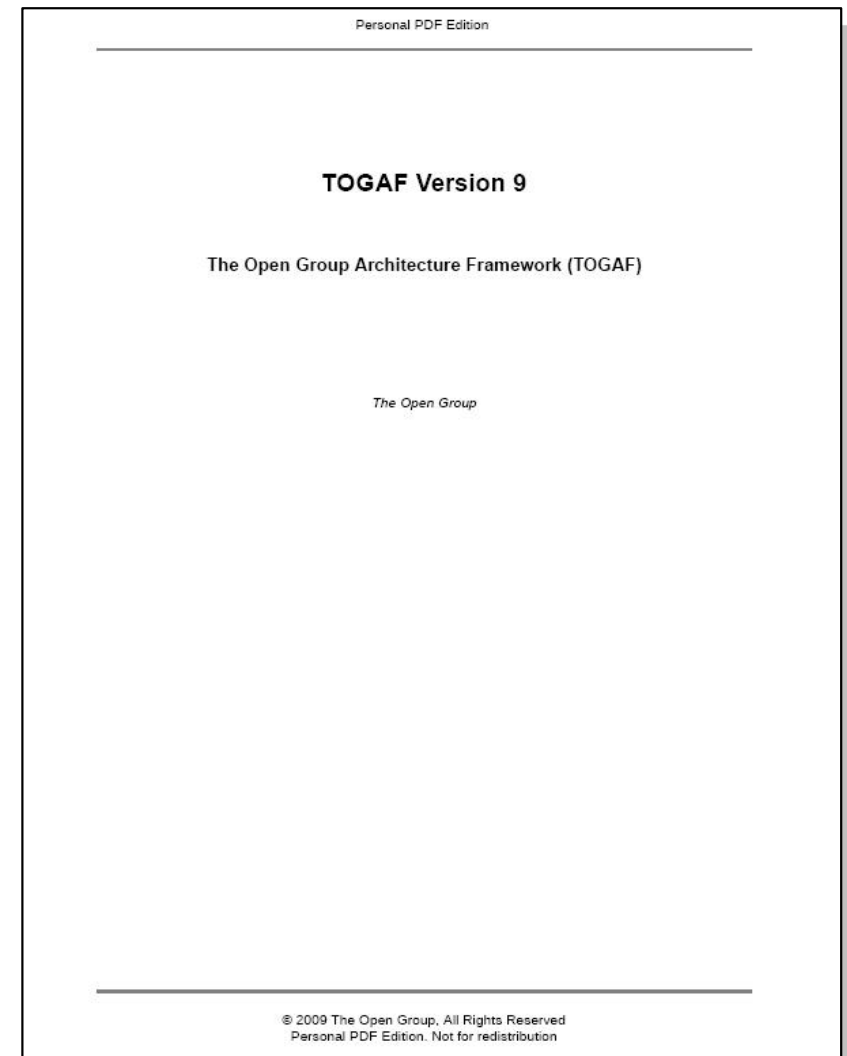
Other Frameworks

Translates Business Drivers into Capabilities



TOGAF 9 – Available Free, On-line

- TOGAF 9 Personal PDF Edition
- A wealth of great information!



Overview of System Architect



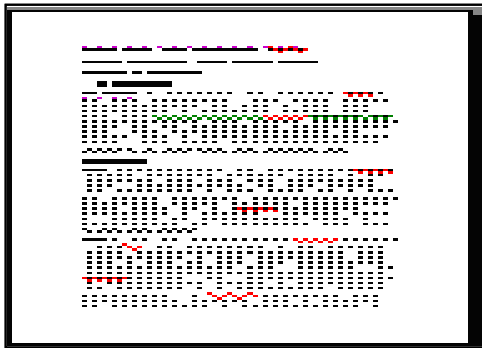
Statement of the Context of the Problem We Are Trying to Solve

- Lots of data
- Many different domains
- Complex interrelationships
- Change is constant
- Time is a dimension
- Many interested parties
- People ask questions and want answers
- Need a Framework for guidance



Stand-alone documents often mix model elements and viewpoints in different ways

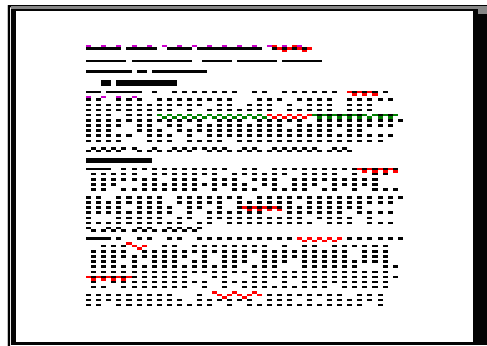
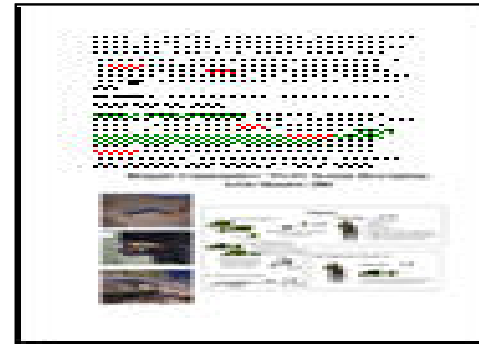
Operational Capability



Strategic Requirement



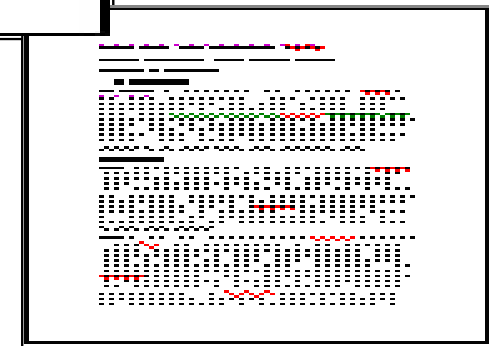
User Requirement



System Specification



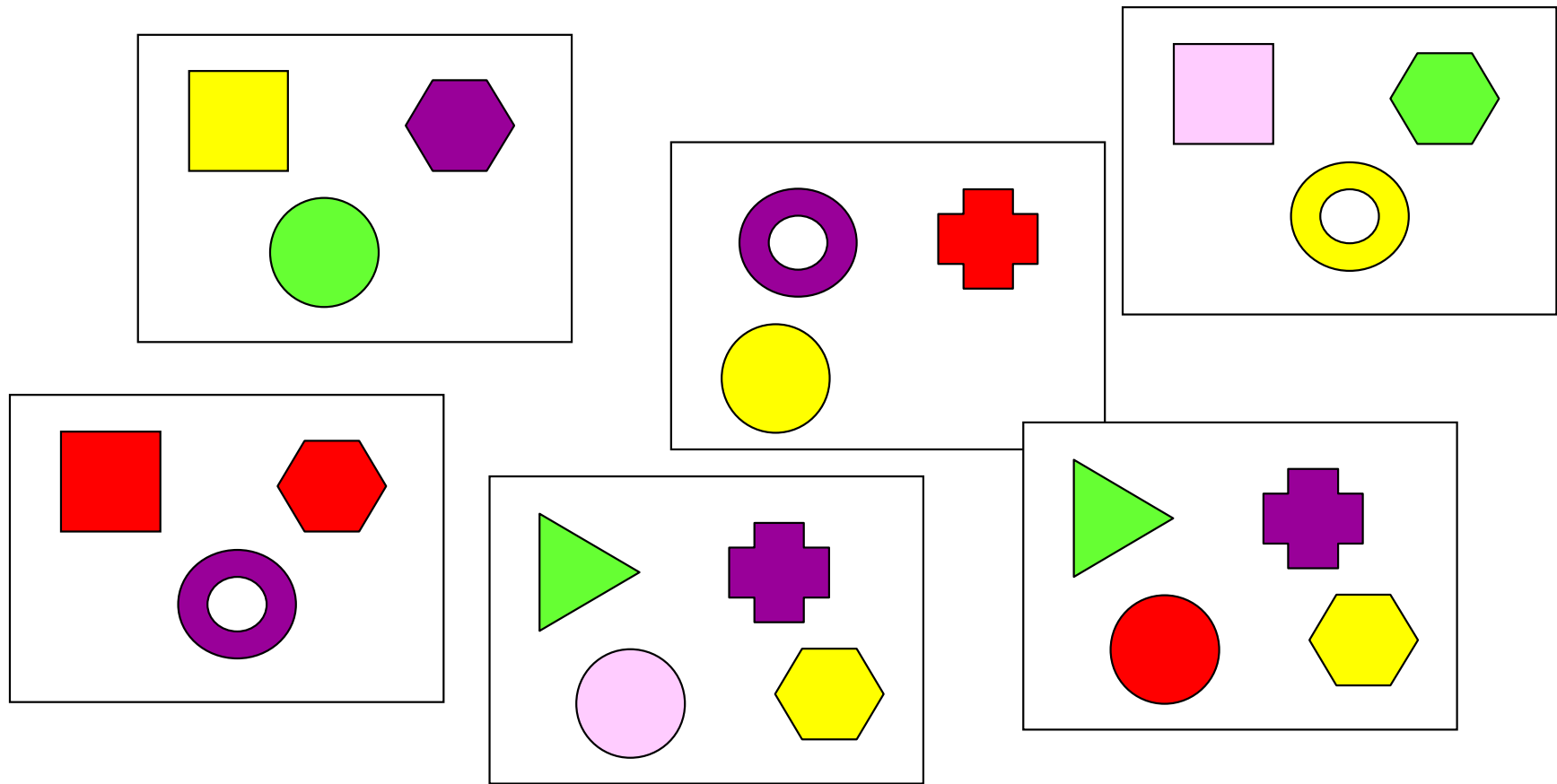
Acquisition Plan



Logistic Support Plan

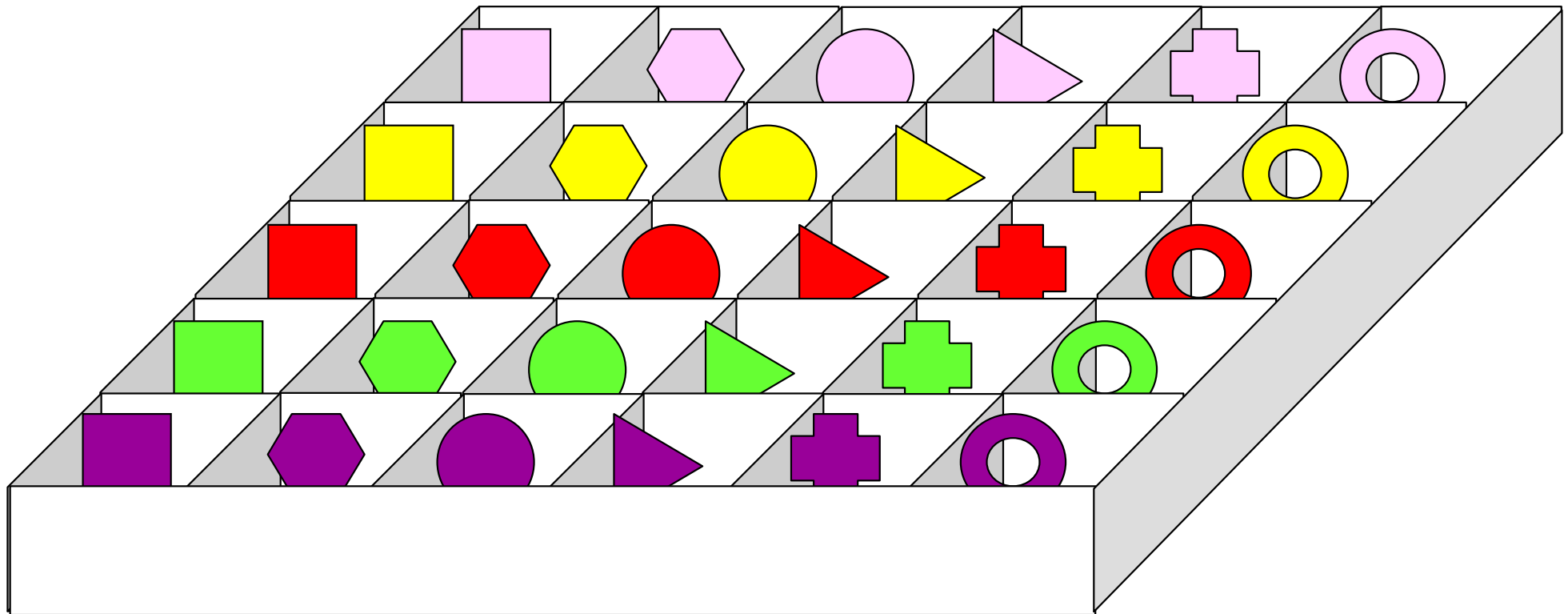


Stand-alone documents often mix model elements and viewpoints in different ways



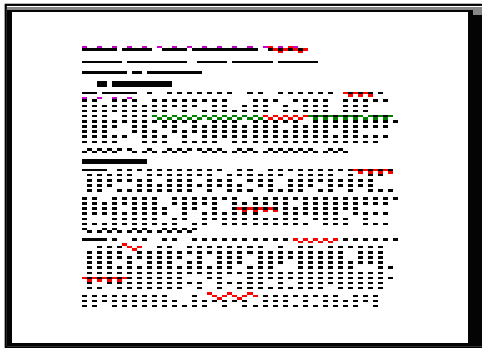
A Framework provides a standard way of categorising model elements

- Helps to identify overlaps, gaps, conflicts
- Encourages re-use



Consistent documents can be generated from a Framework-based architecture

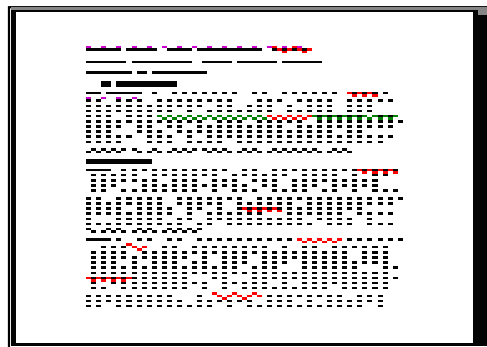
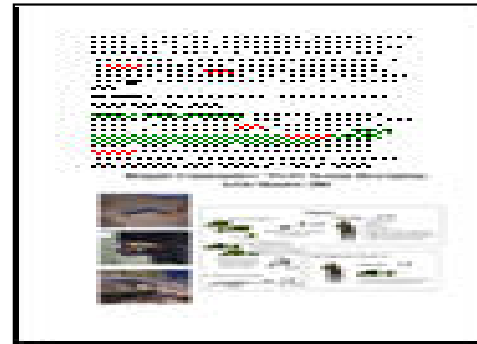
Operational Capability



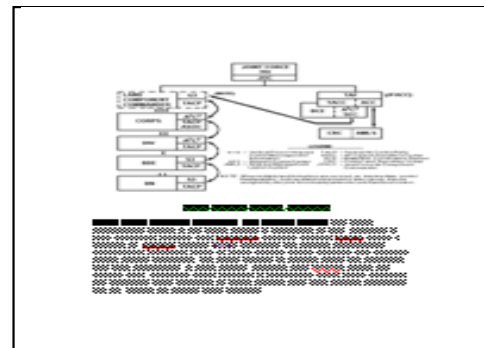
Strategic (e.g. Staff) Requirement



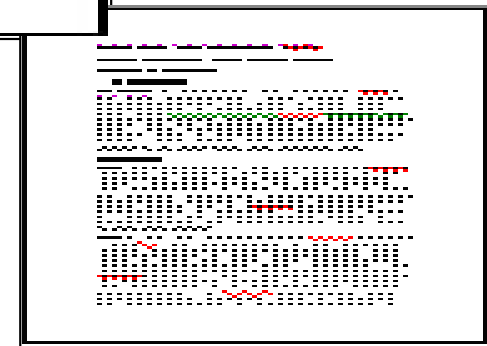
User Requirement



System Specification



Acquisition Plan



Logistic Support Plan



TOGAF 9 Assumes the use of a Repository

Architecture Repository

“Operating a mature architecture capability within a large enterprise creates a huge volume of architectural output. Effective management and leverage of these architectural work products require a formal taxonomy for different types of architectural asset alongside dedicated processes and tools for architectural content storage.”

Source: TOGAF Online, The Open Group

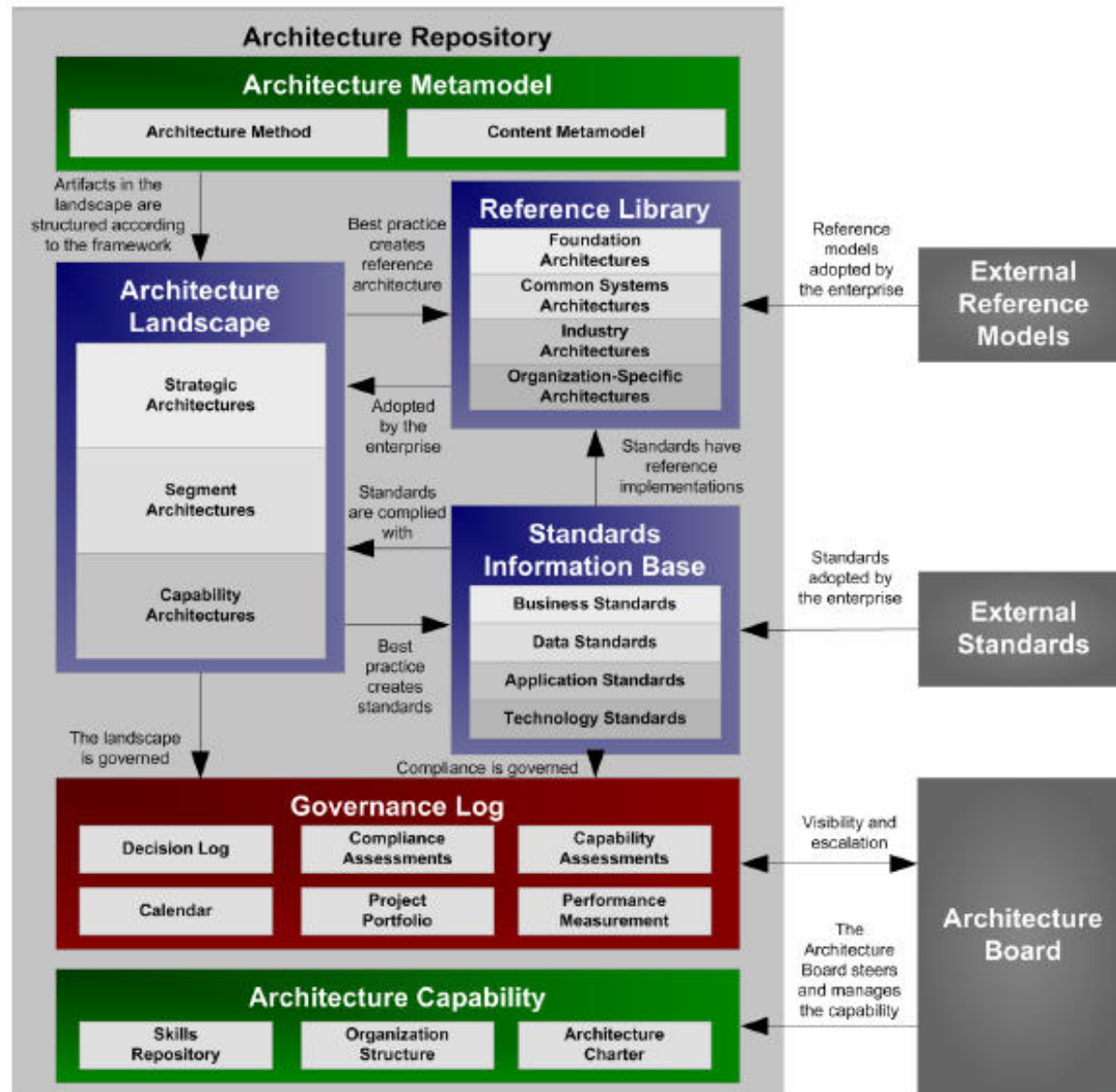


What's in a TOGAF 9 Repository?

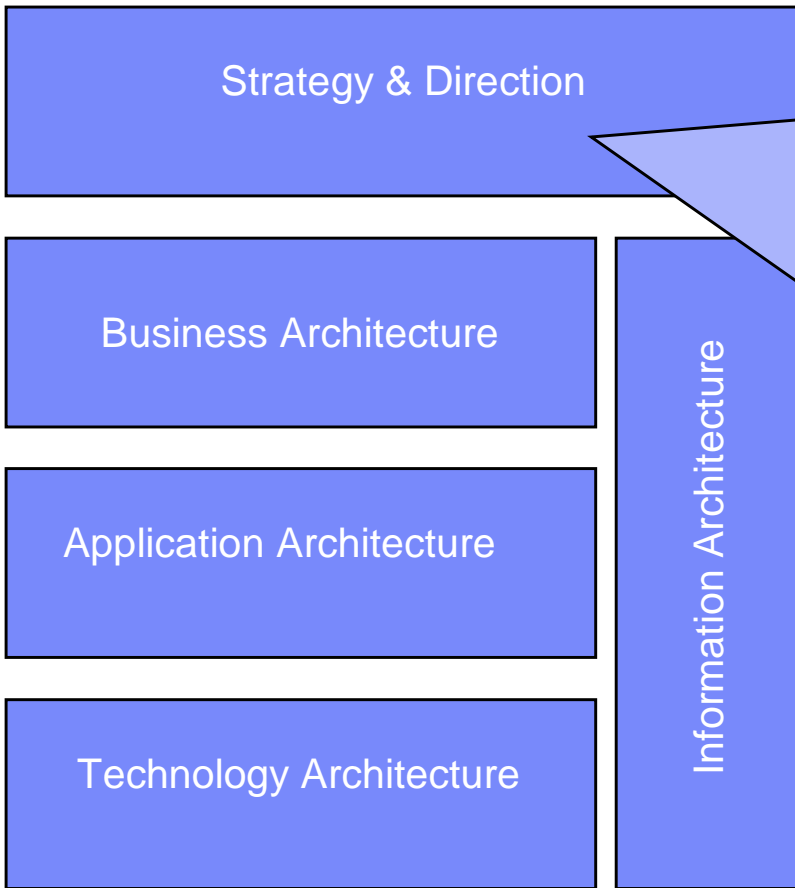
- **Architecture Metamodel**
 - ▶ describes the organisationally tailored application of an architecture framework, including a method for architecture development and a metamodel for architecture content.
- **Architecture Capability**
 - ▶ Parameters, structures, and processes to support governance of the Architecture Repository.
- **Architecture Landscape**
 - ▶ shows an architectural view of the building blocks that are in use within the organisation today (e.g., a list of the live applications).
- **Standards Information Base**
 - ▶ Standards with which new architectures must comply. May include industry standards, products and services from suppliers, or shared services already deployed.
- **Reference Library**
 - ▶ provides guidelines, templates, patterns, and other forms of reference material that can be leveraged in order to accelerate the creation of new architectures for the enterprise.
- **Governance Log**
 - ▶ provides a record of governance activity across the enterprise.



Architecture Repository



Supports Complete Architecture Frameworks

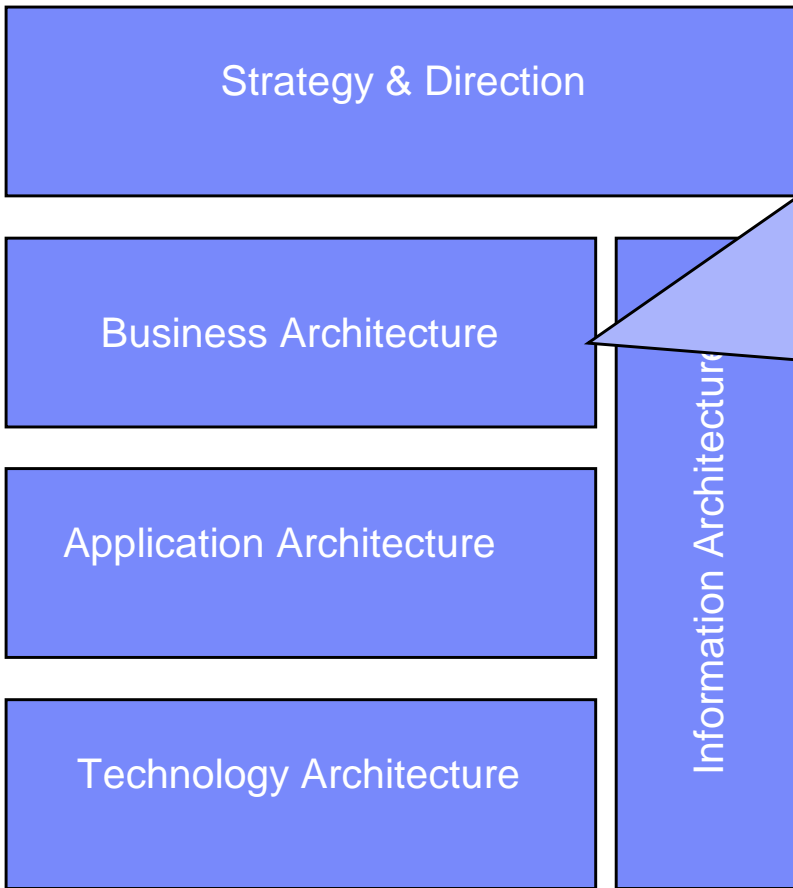


This does not represent any specific framework

- Strategy Maps
- Enterprise Direction Diagrams

For Example

Supports Complete Architecture Frameworks



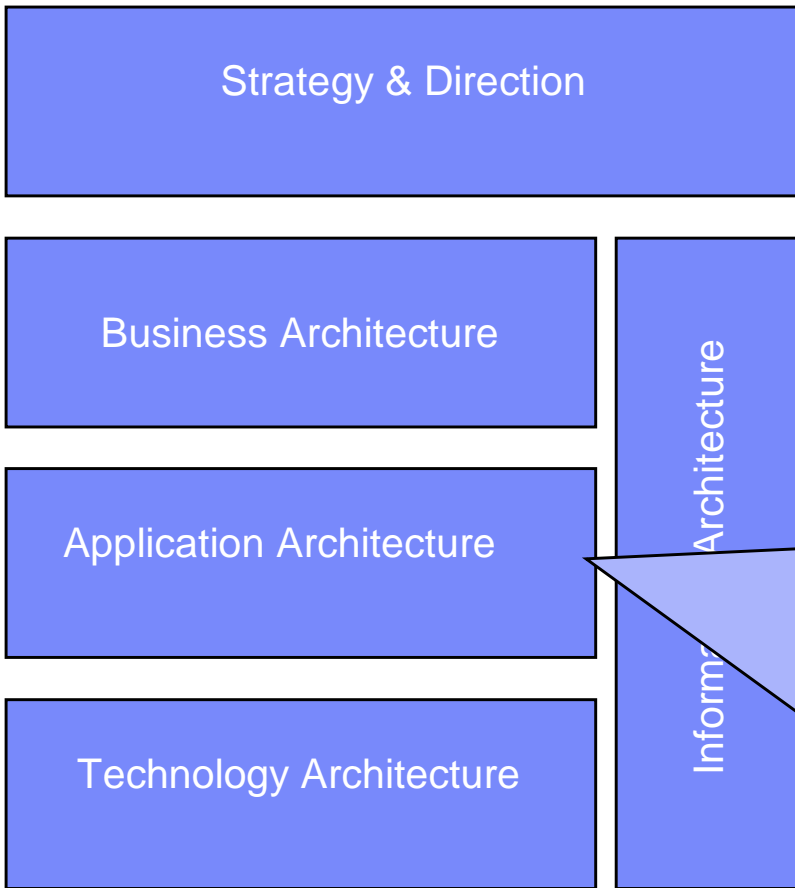
This does not represent any specific framework

- Organisation Models & ABBs
- Business Structure & ABBs
- Functional Models & ABBs
- Process Models & ABBs

For Example



Supports Complete Architecture Frameworks



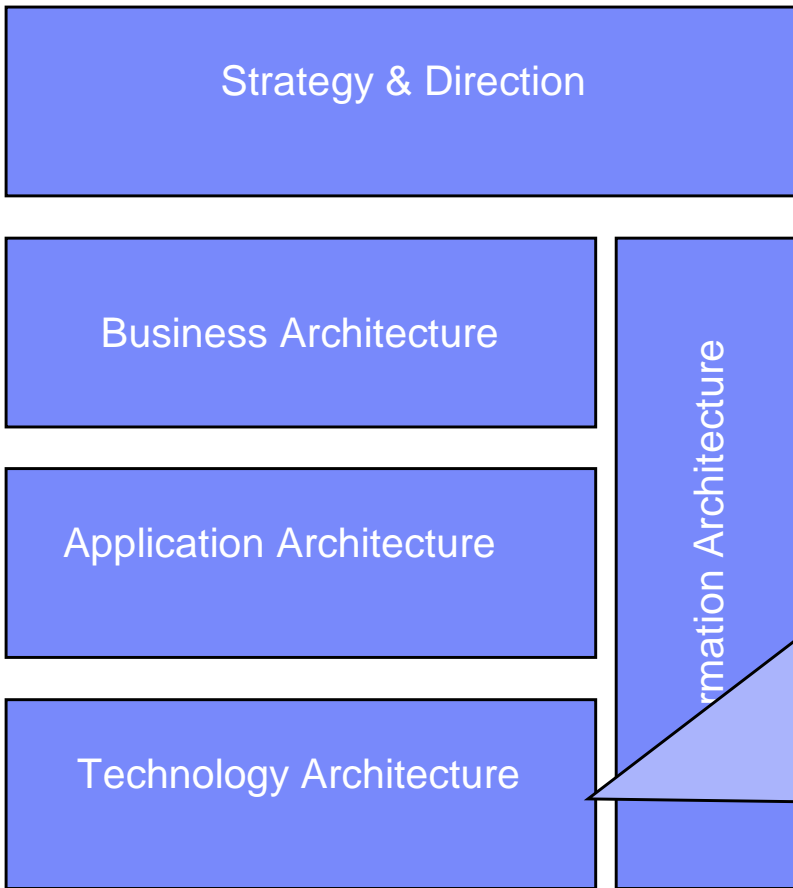
This does not represent any specific framework

- Application Models & ABBs
- User Models & ABBs

For Example



Supports Complete Architecture Frameworks



This does not represent any specific framework

- Hardware Models & ABBs
- Technology Reference Models

For Example



Supports Complete Architecture Frameworks

Strategy & Direction

Business Architecture

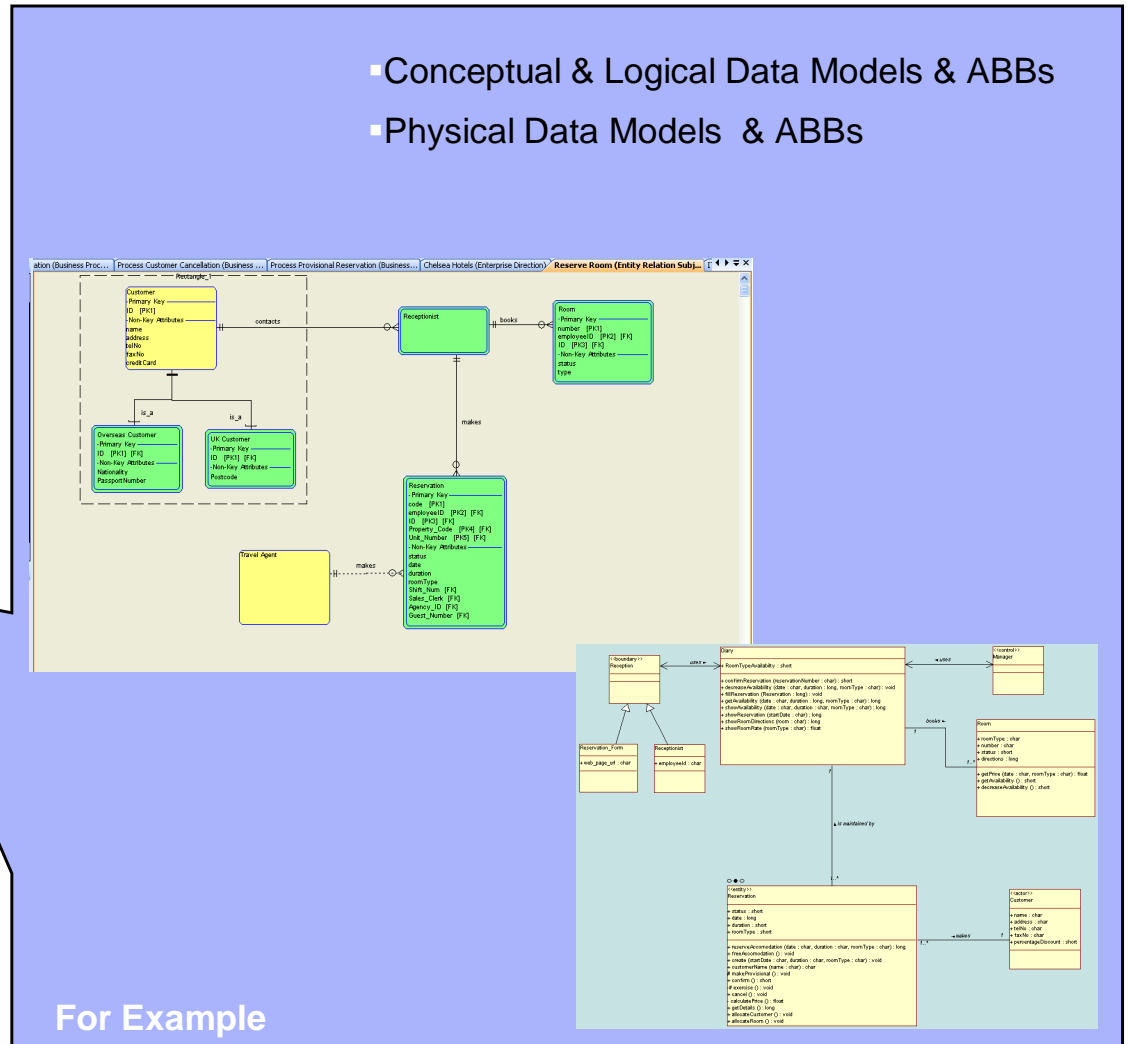
Application Architecture

Technology Architecture

Information Architecture

This does not represent any specific framework

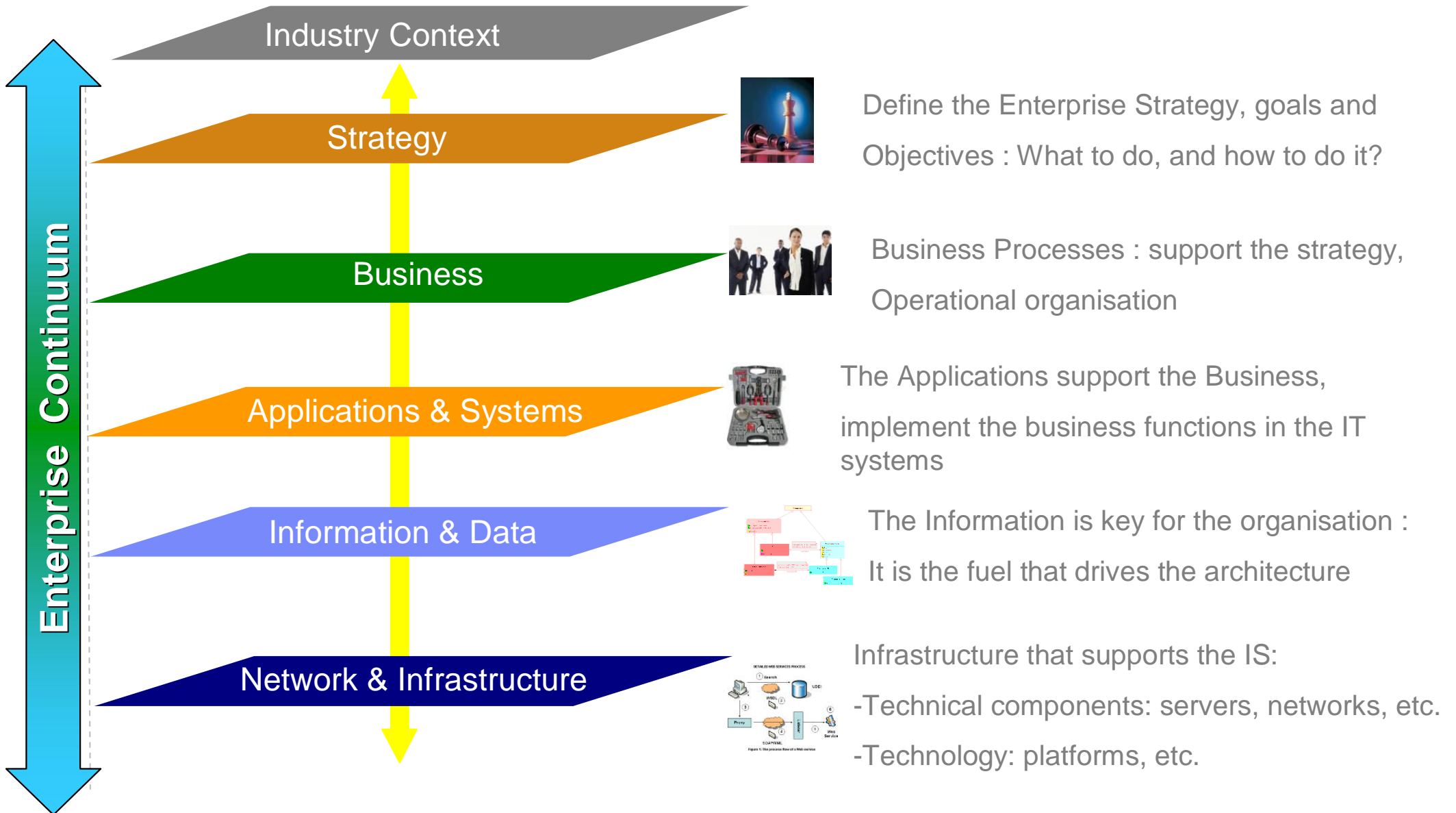
- Conceptual & Logical Data Models & ABBs
- Physical Data Models & ABBs



For Example

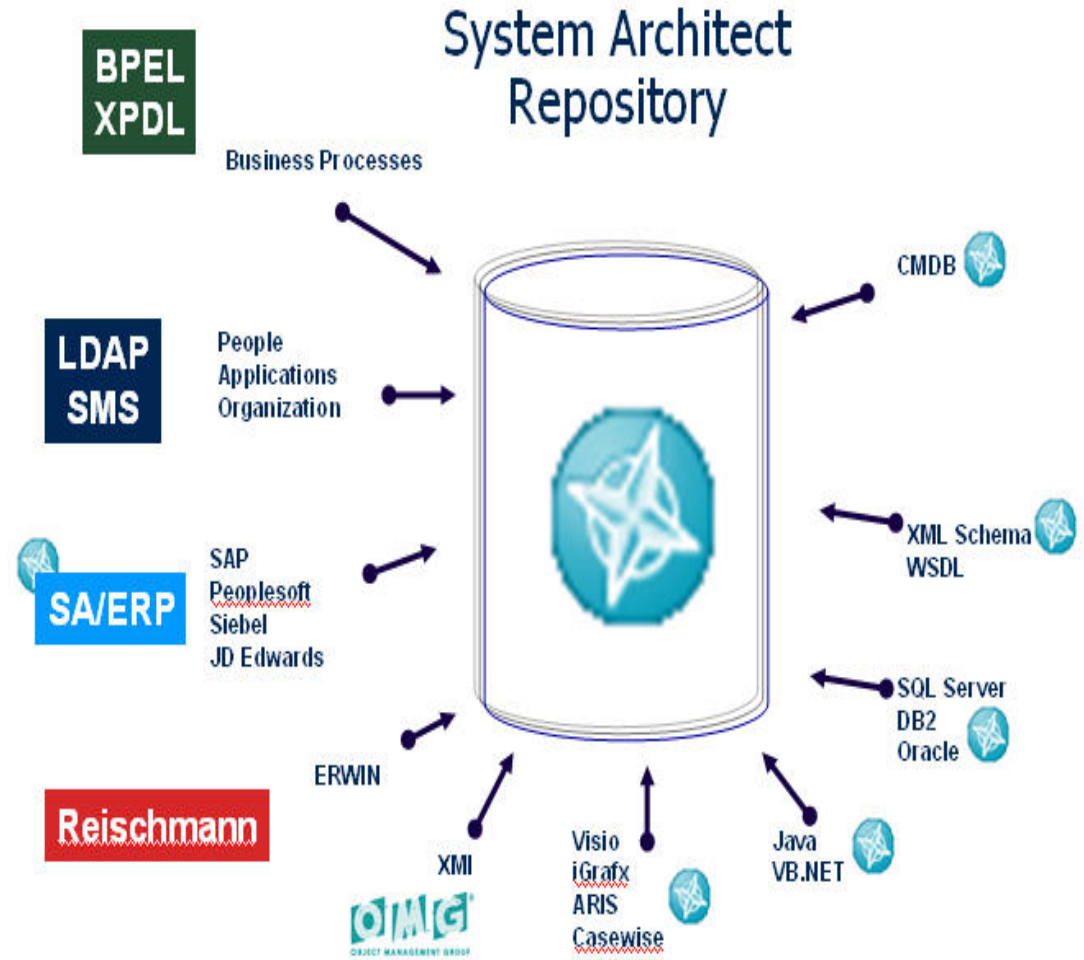


Enterprise Architecture



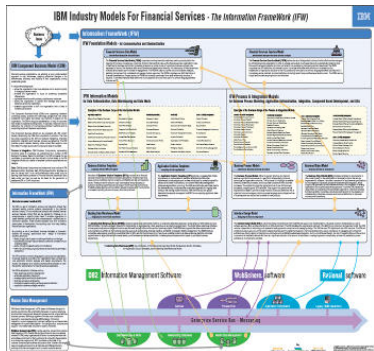
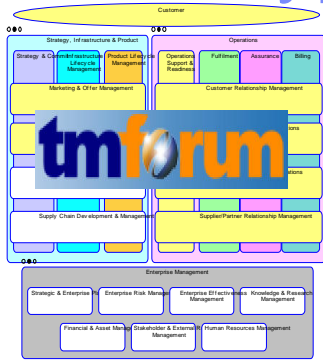
Feature Areas

- Harvesting (auto discovery)
- Multiple Method Support
- Multi-user repository
- Extensible Metamodel
- Multi-Framework
- Standards based modeling
- Impact Analysis/Traceability
- Analytics/Heatmaps/Simulations
- Reporting
- Web Publishing
- Model Comparison
- Extended Team Support
- Govern and Control
- Tool interoperability (EA Ecosystem)
- Reference Models

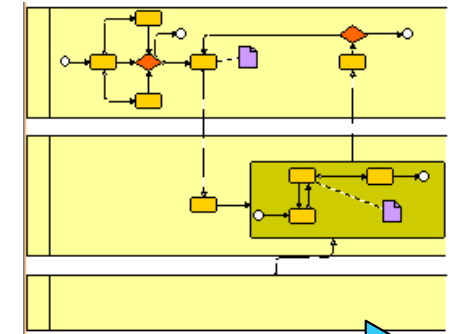
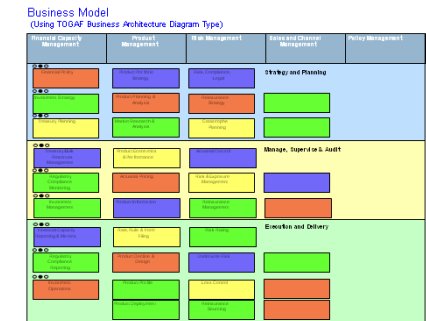
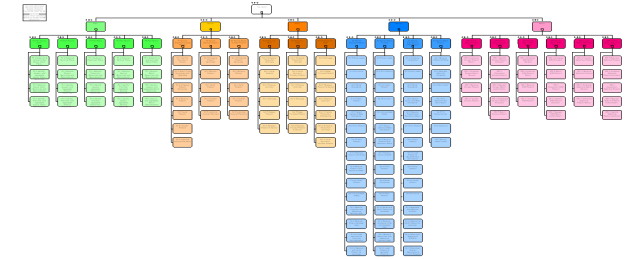
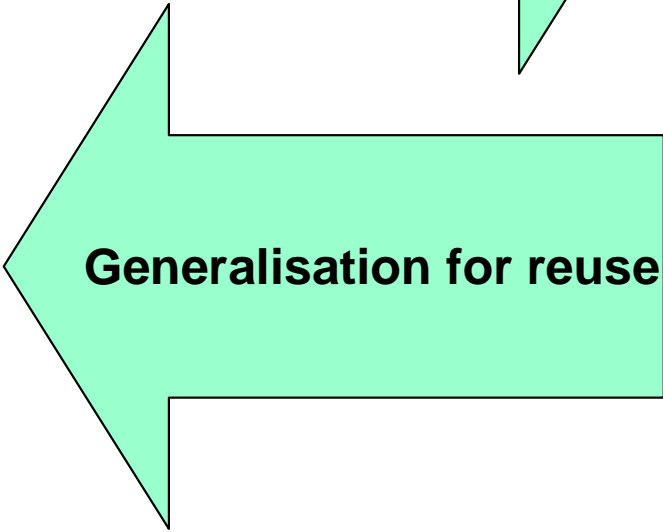
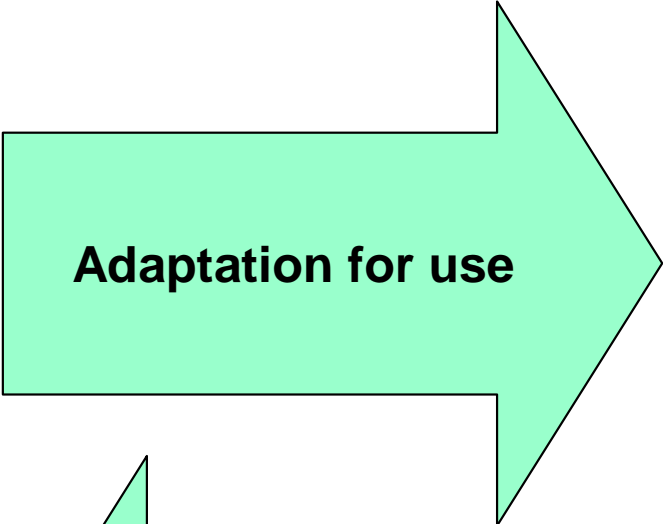


Different Types of Architectures

More general

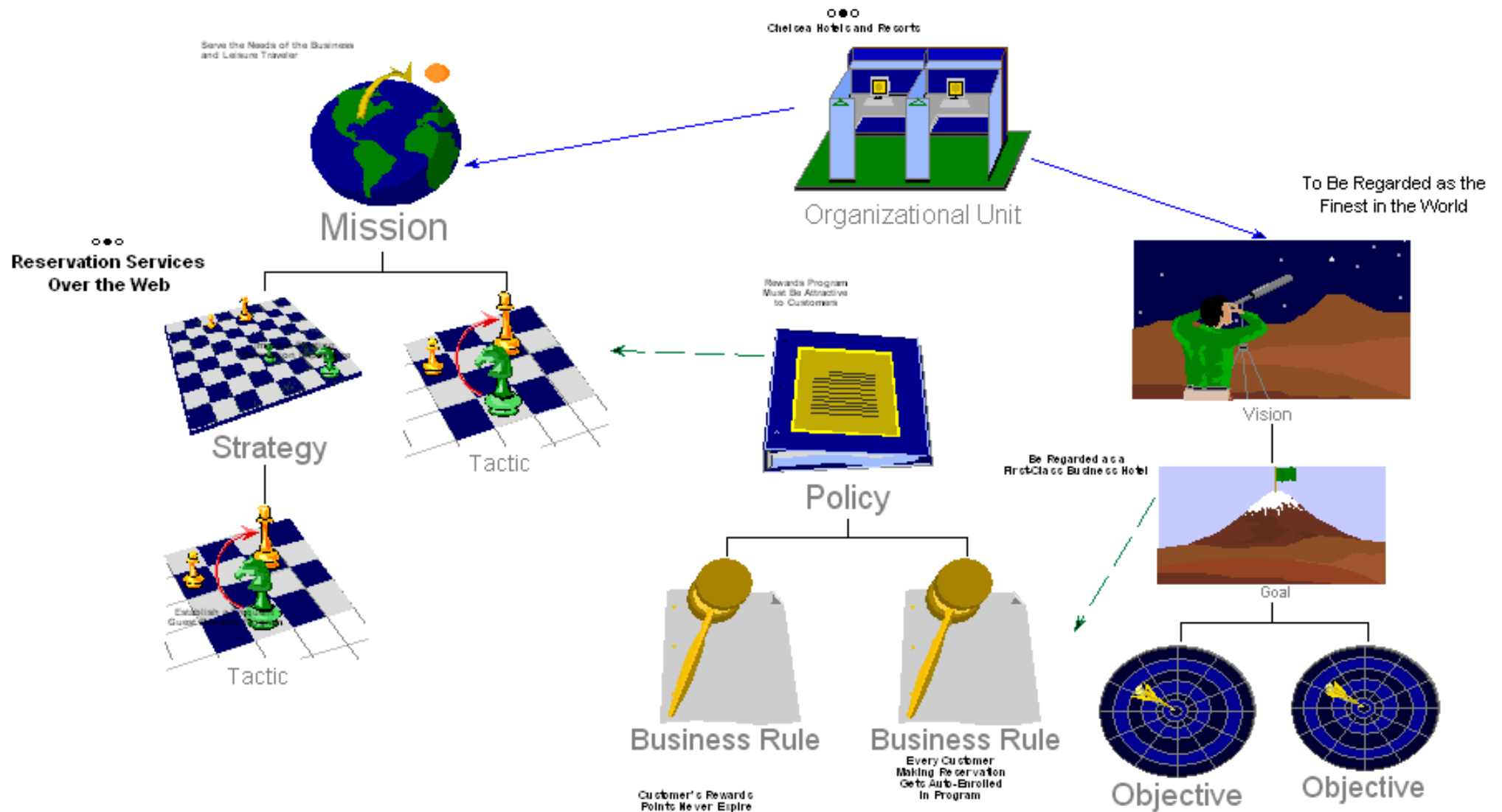


Supply-Chain Operations Reference-model

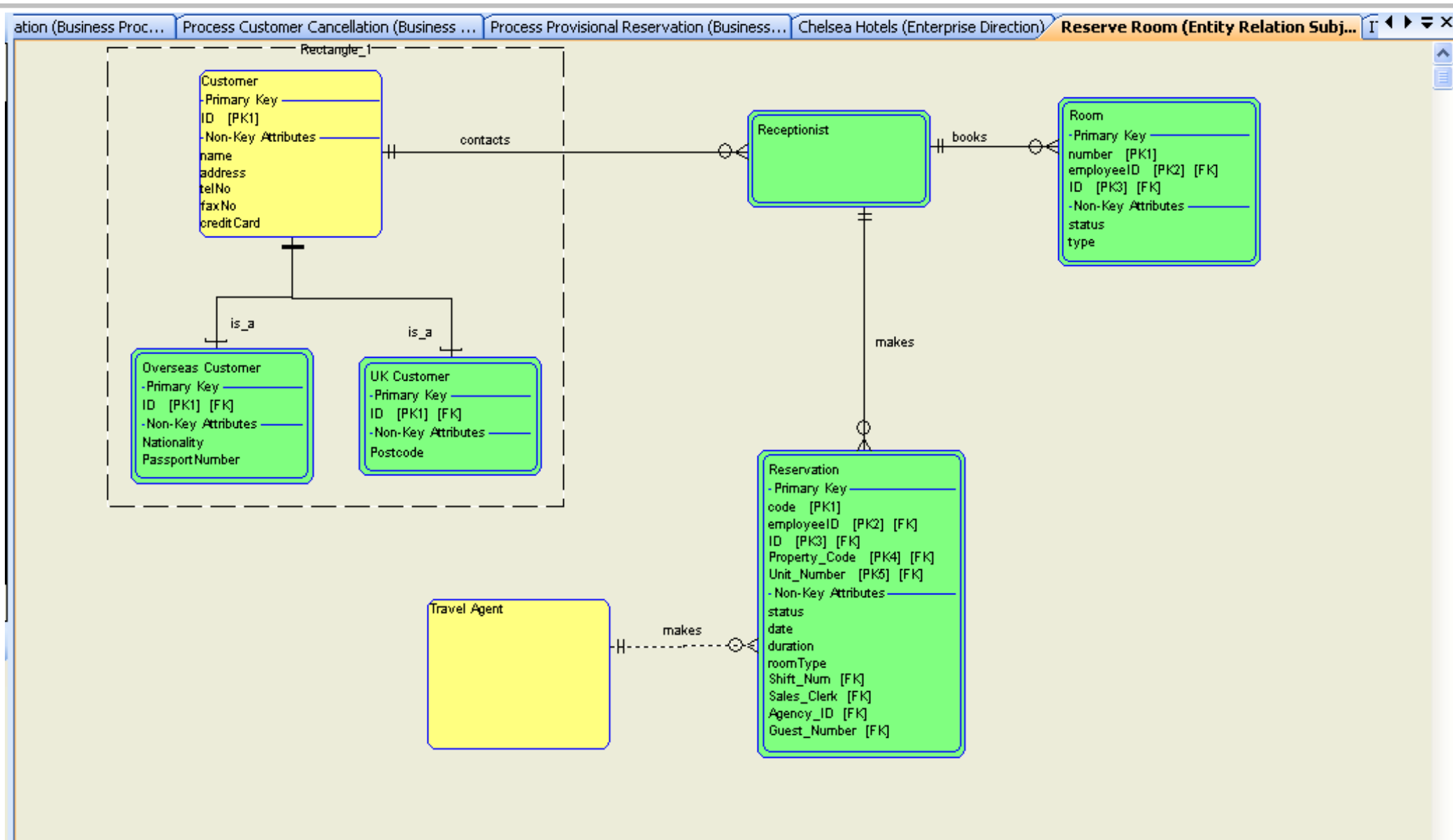


Capture and Model all Domains of the Organisation

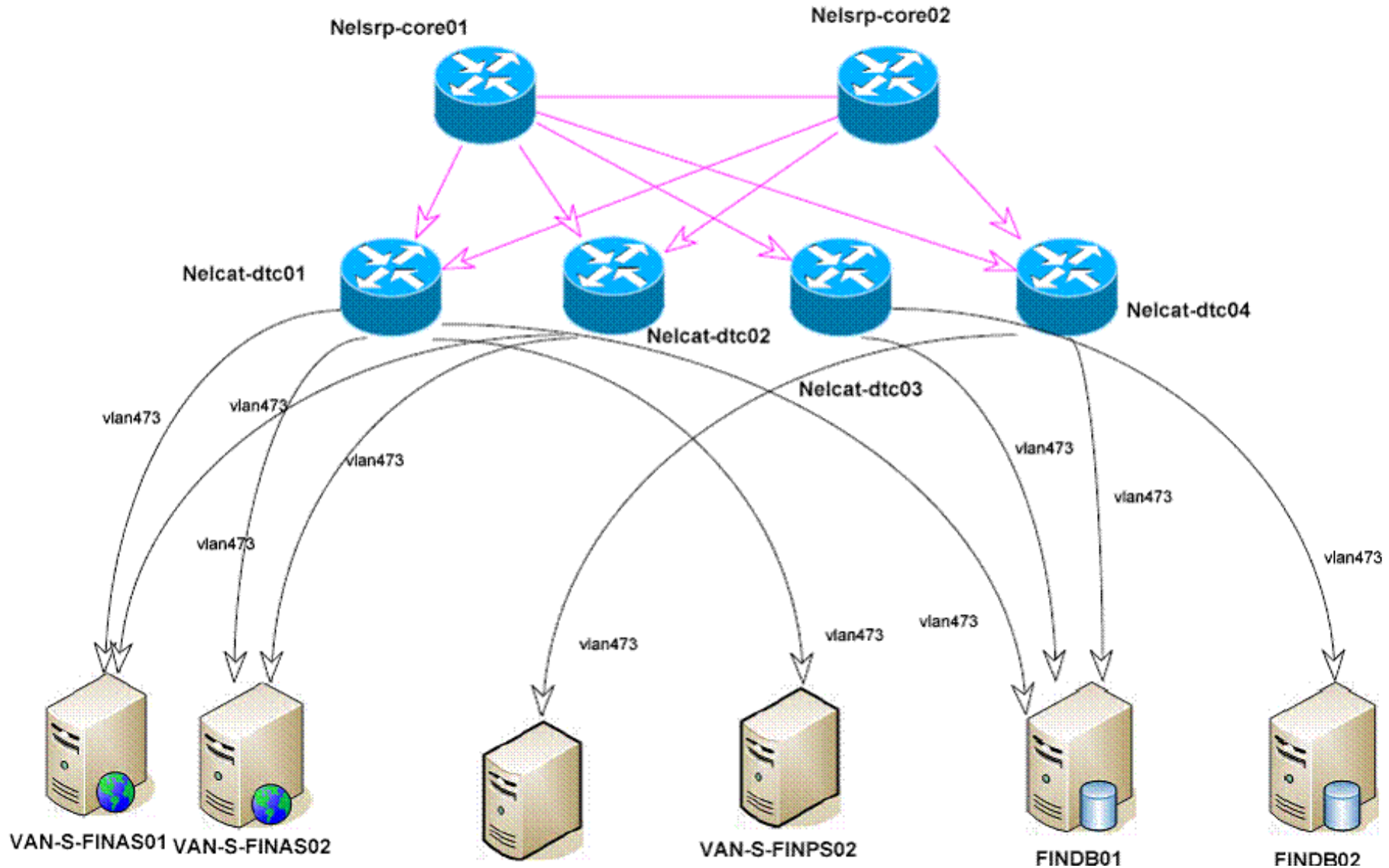
Business Strategy - Enterprise Direction Diagram



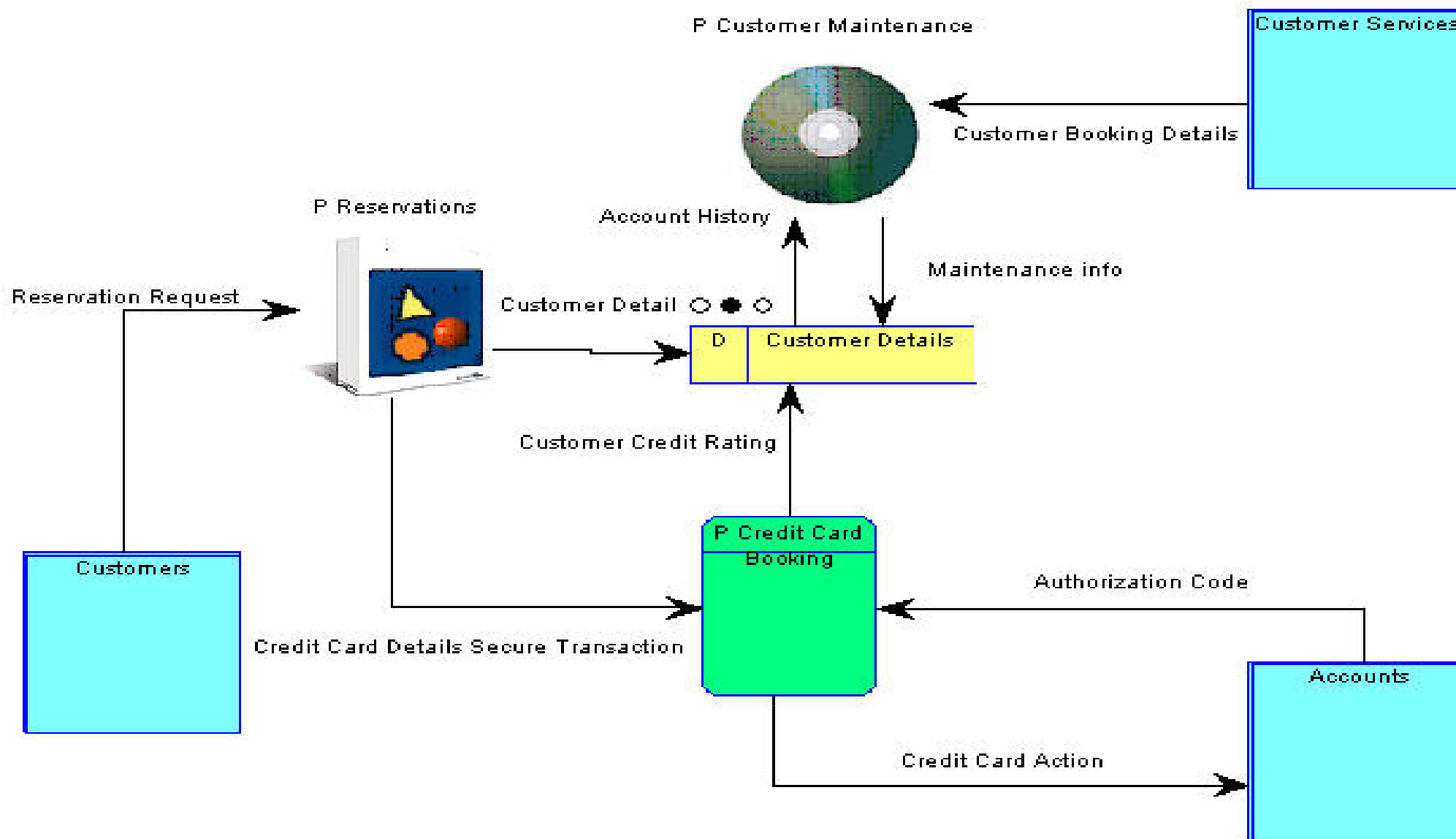
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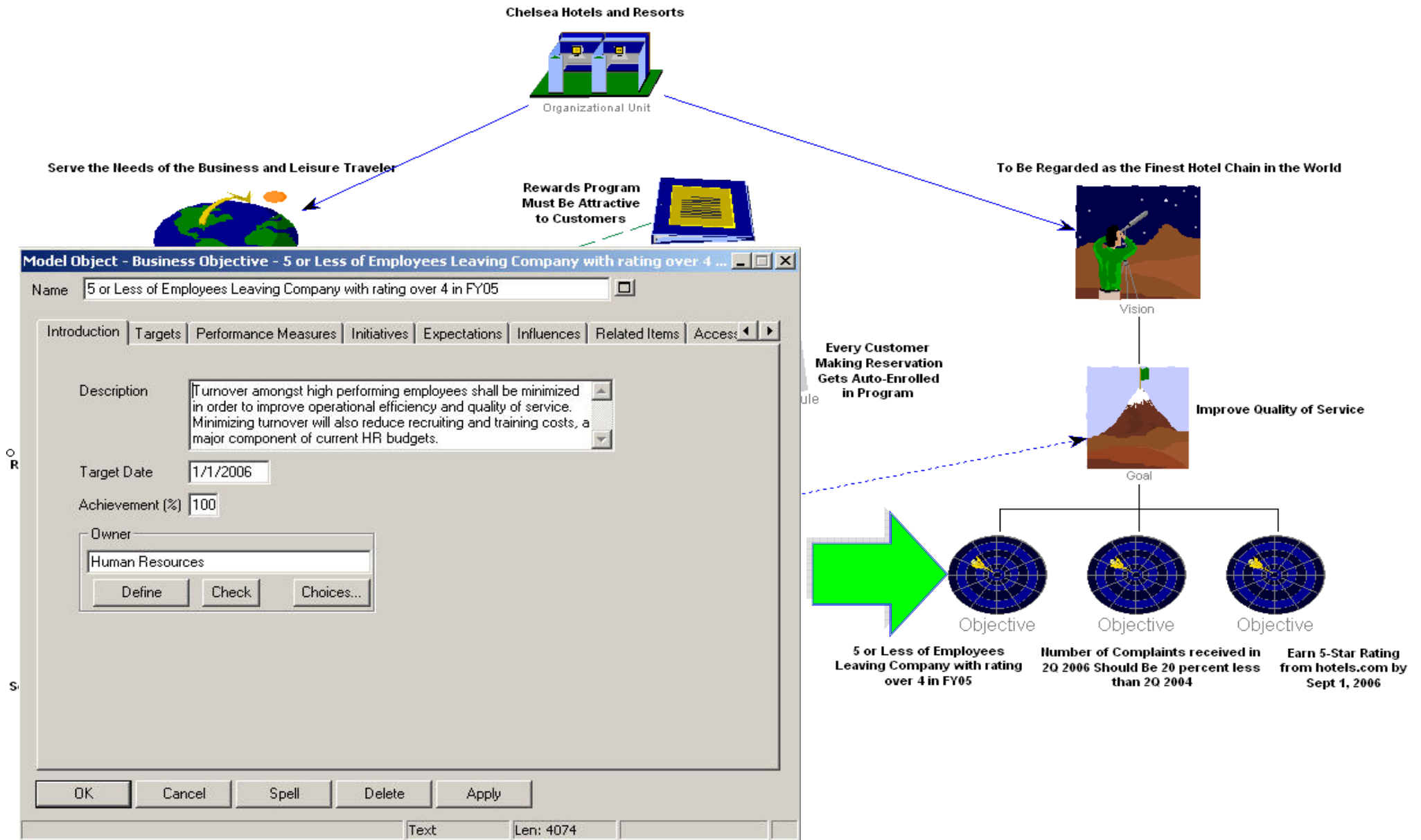
Capture and Model all Domains of the Organisation



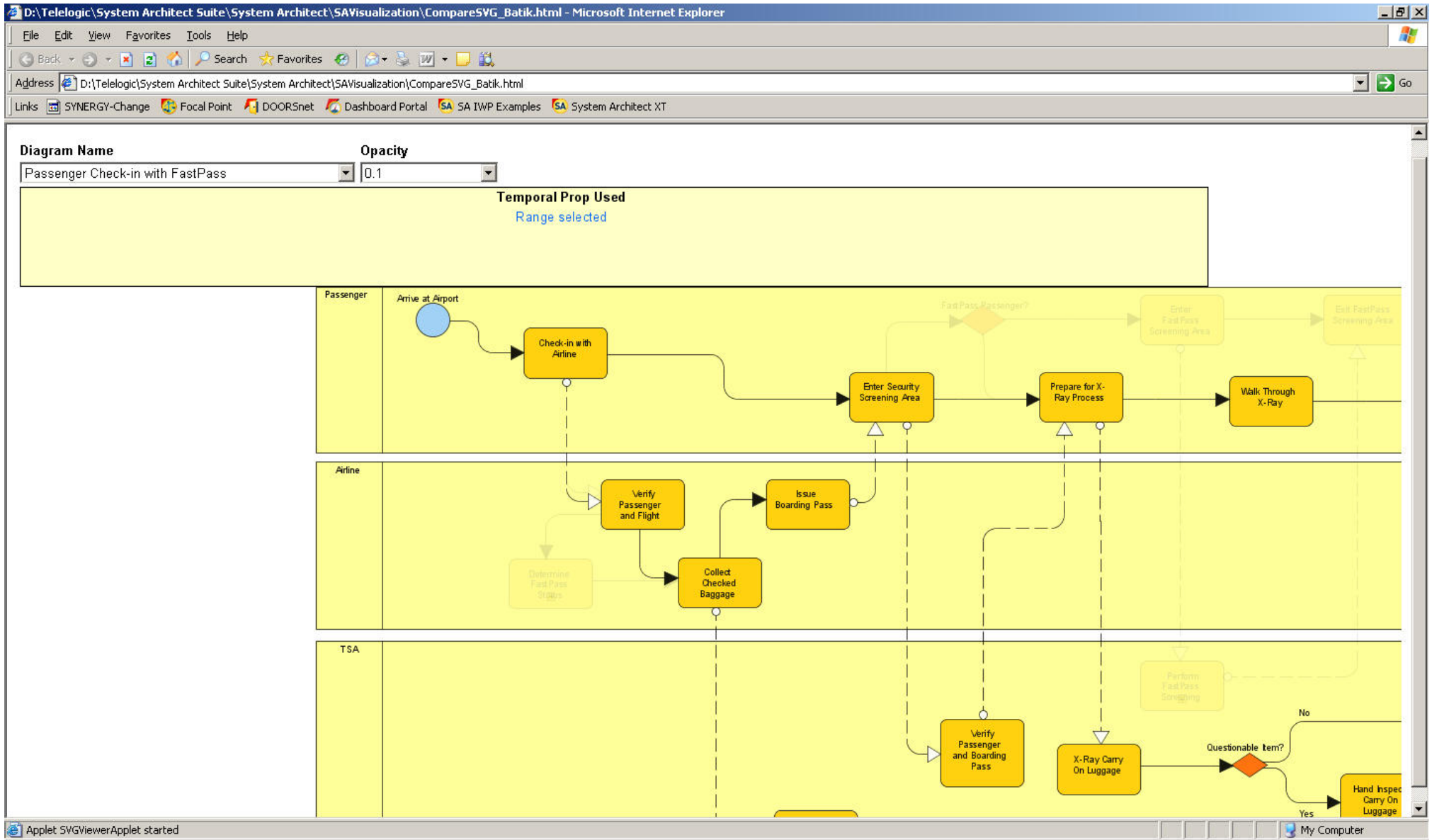
Capture and Model all Domains of the Organisation



Visualise Goals and Objectives

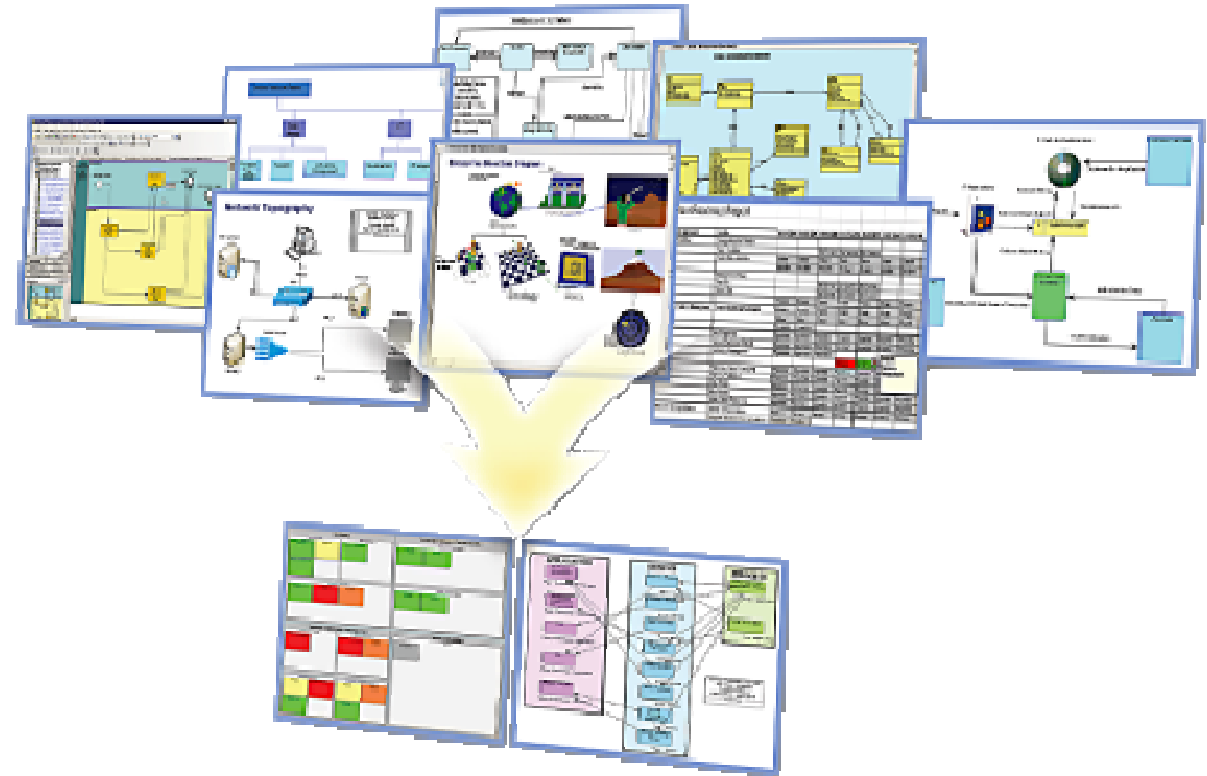


As-Is/To-Be Transition



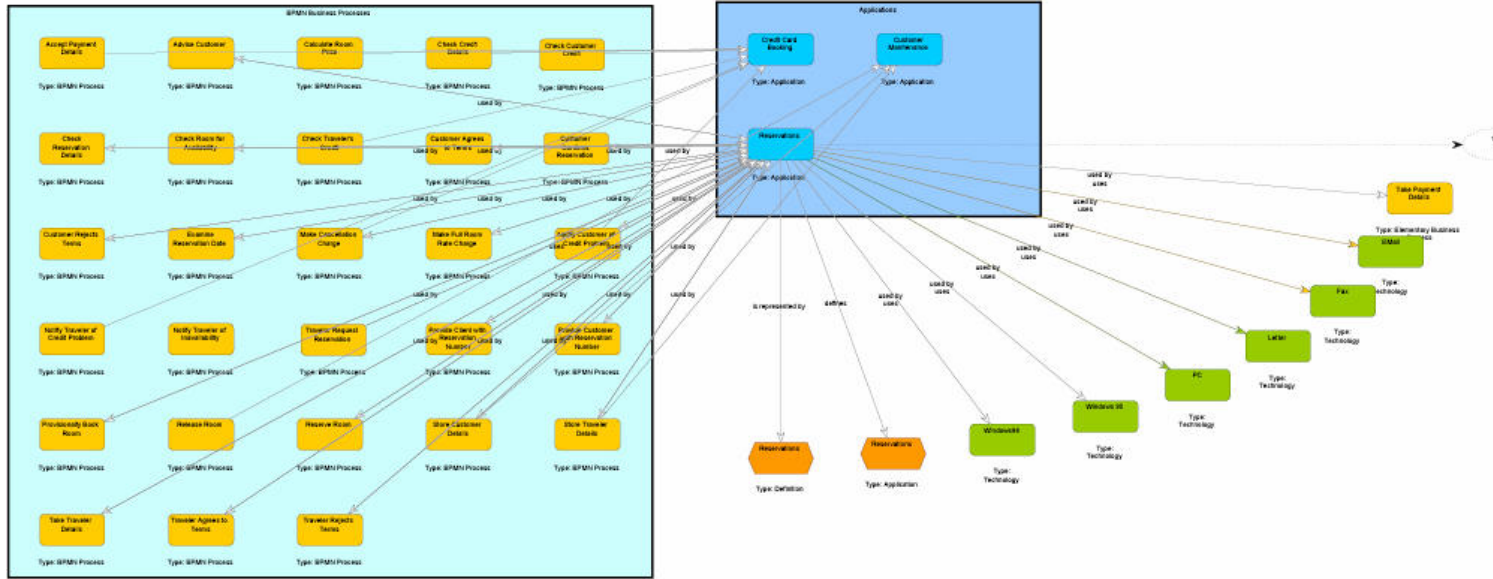
More Than a Modelling Tool

- Impact Analysis
- Alignment
- Transition state planning
- What-if?
- Risk analysis
- Heat map generation



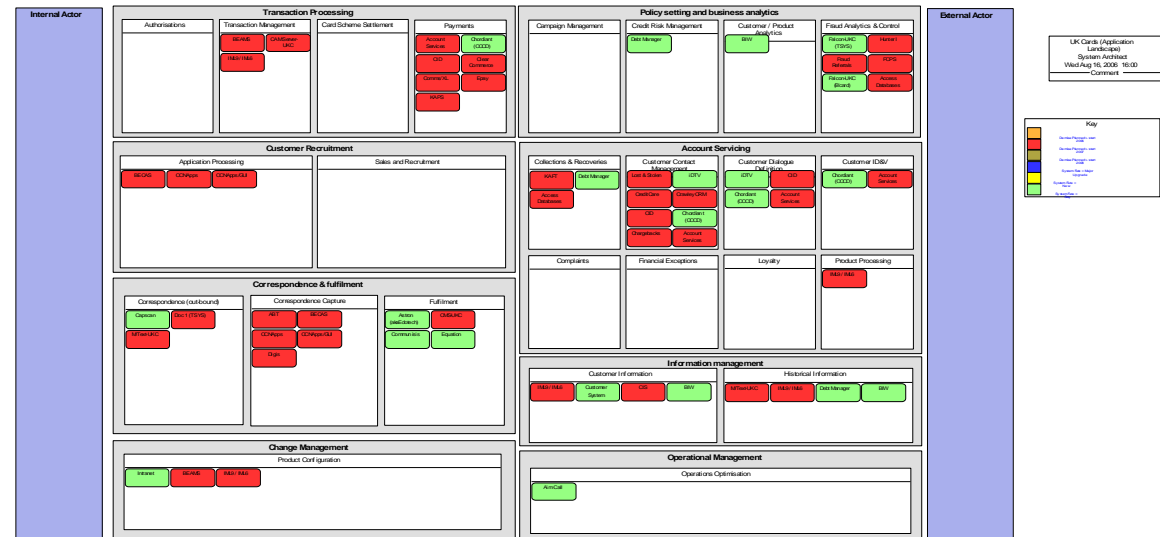
Impact Analysis and Reuse Reporting

Applications Supporting (BPMN) Business Processes

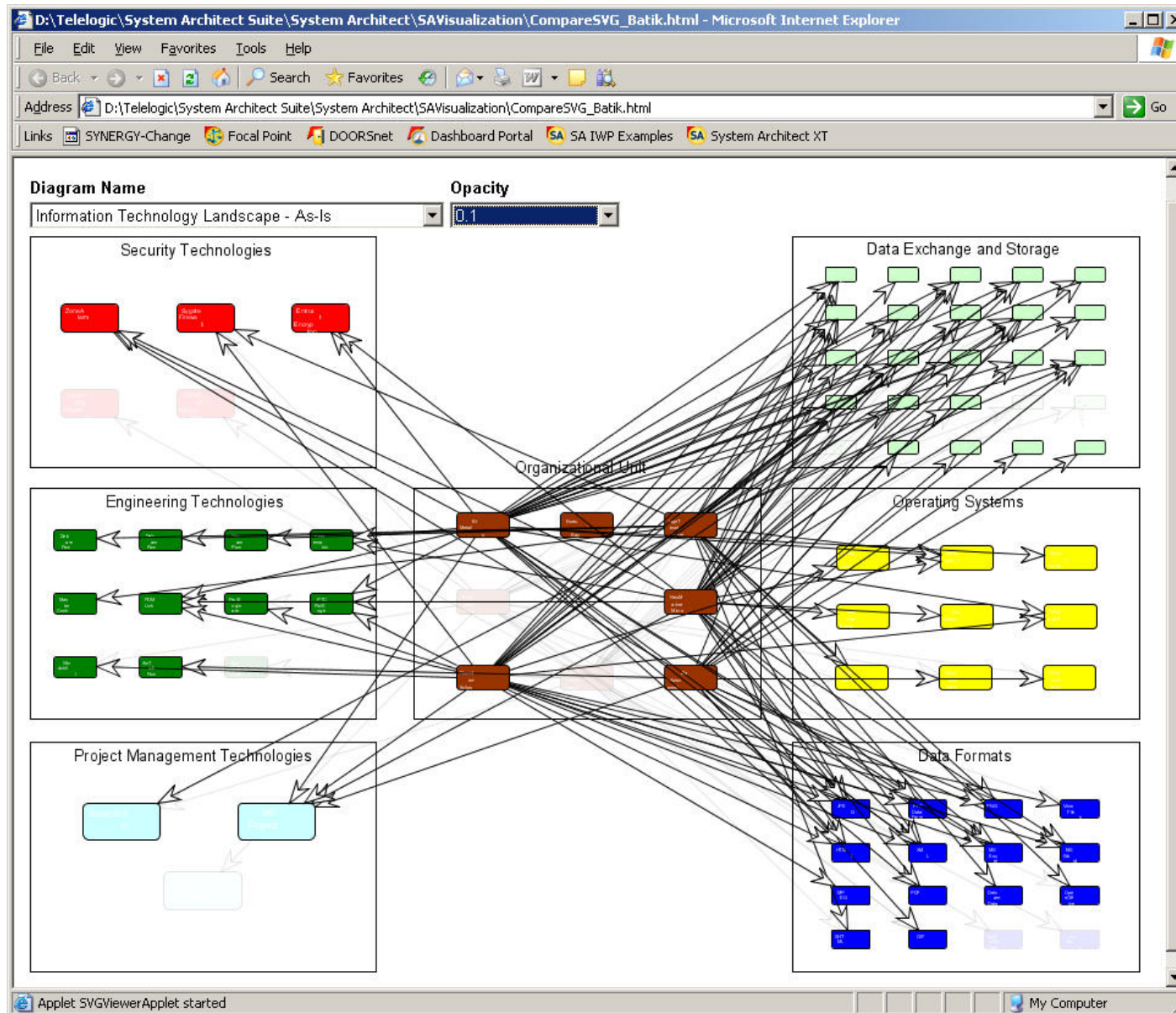


- Visualise and understand the impact of change

- Landscape Reports**
 Communicate project information



What if Analysis



Use Matrices to View Relationships...

Matrix Browser

- UOB to Function/Activity
- UOB to DLP
- Requirement to Process Thread
- Elem Bus Process to Application
- Elem Bus Process to Derived Logical Process
- Elem Bus Process to Entity
- Elem Bus Process to Function
- Elem Bus Process to Location
- Elem Bus Process to Process Thread
- Elem Bus Process to Role
- Elem Bus Process to Technology
- Event to Result
- Data Distribution Scheme
- Business Process (BPMN) to Location
- Business Process (BPMN) to Application
- Business Process (BPMN) to Entity
- Business Process (BPMN) to Data Object
- Business Process (BPMN) to Technology
- Business Process (BPMN) to Function
- Business Process (BPMN) to Role

ED IDEF BE Org
 Loc App Data Tech
 Misc Saved User

Application	Elementary Business Process	Answer Phone	Business Case Routed for Approval	Calculate Room Price	Check Payment Details	Check Reservation Details	Check Room Availability	Examine Period to Accom Date	Inform Customers Company	Make Cancellation Charge	Make Full Room Rate Charge	Make Percentage Room Rate Charge	NewProcess	Process Room Booking	Process_1	Process_2	Release Room	Reservations and Booking Funcs	Reserve Room	Store Customer Details	Take Payment Details	Test 1	
Bid server																							
Credit Card Booking	X		X		X			X											X	X	X		
Customer Maintenance																				X			
Hotel Maintenance																							
Order Entry	X		X		X																		
Reservations			X		X	X											X		X	X	X		
VendorConnection			X																	X			
new application																							

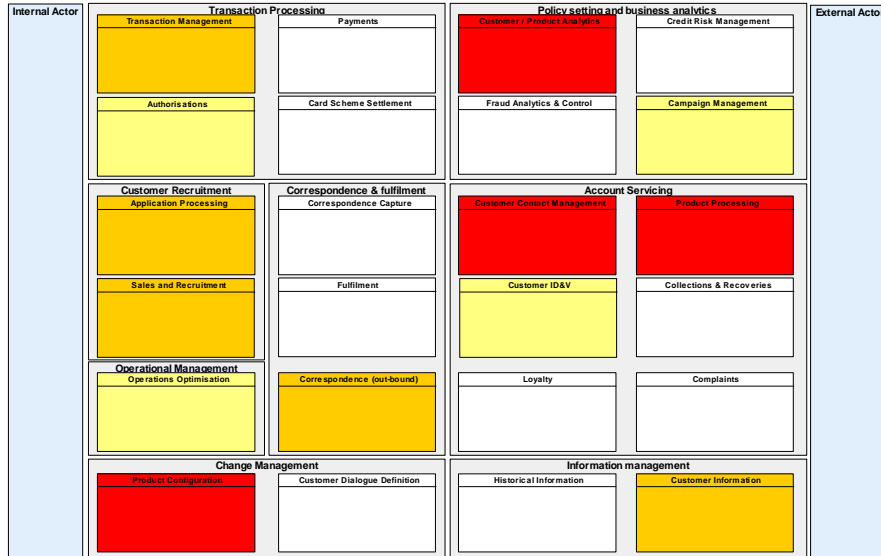


Perform Gap Analyses

What Processes are not Automated?



Is IT aligned to Business Strategy?

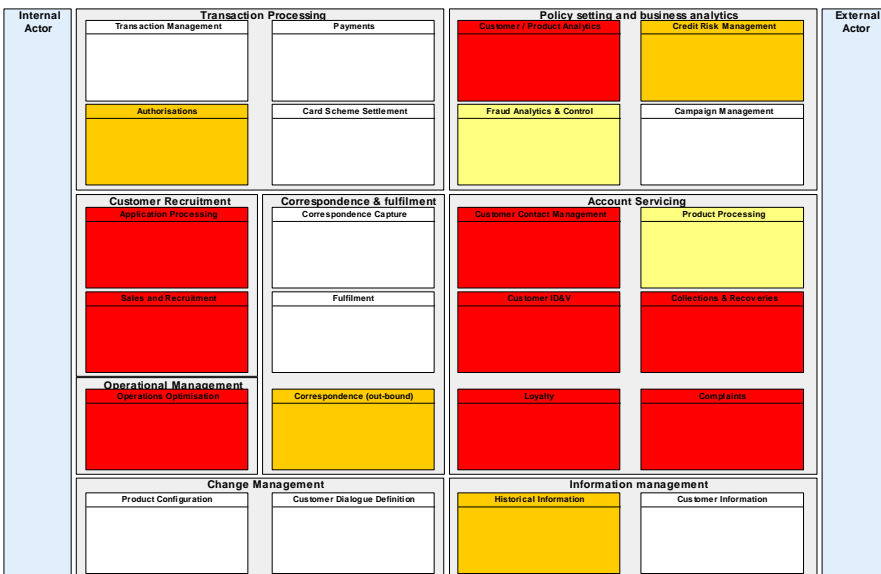


- Business Strategy heatmap

- ▶ Use Application Landscape to show which components expect to be impacted by business strategy

- Change plan heatmap

- ▶ Now show which components are impacted by the current change portfolio



Not an application name in sight

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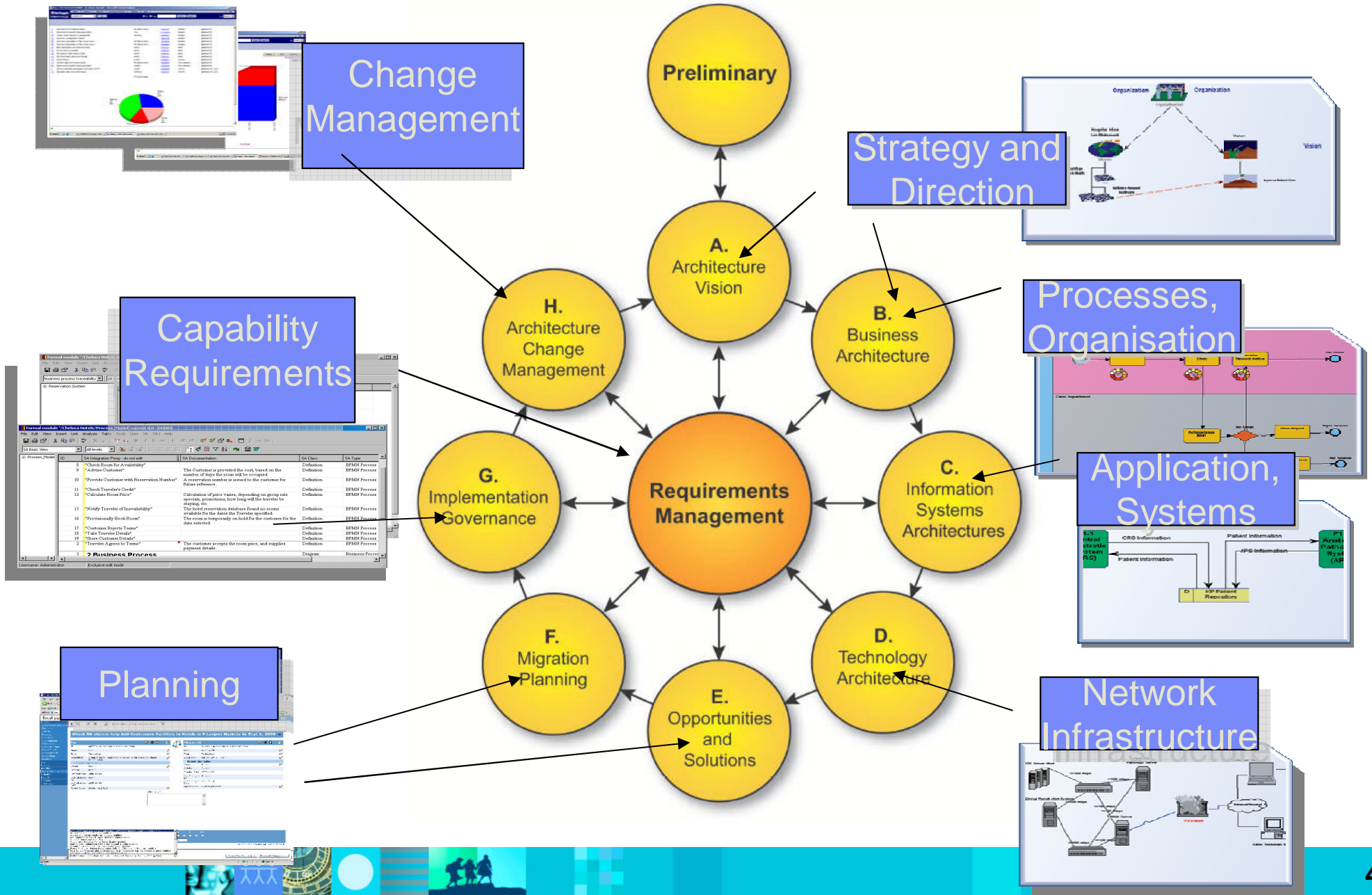
TOGAF
Version 9 Enterprise Edition



TOGAF 9 Within System Architect



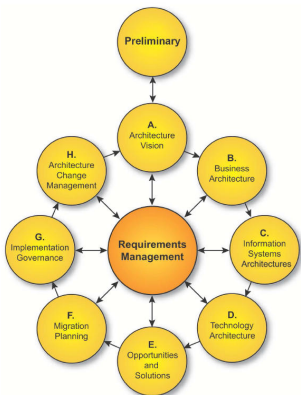
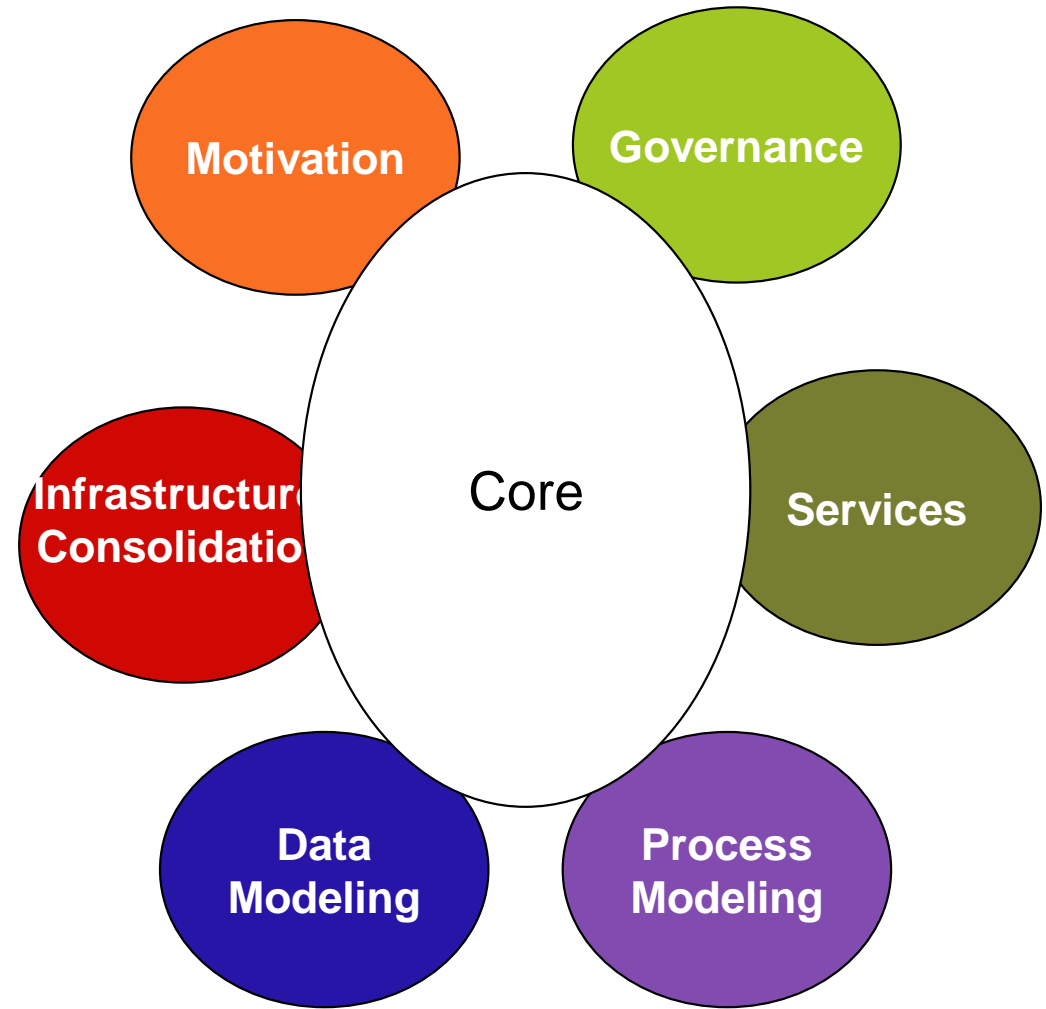
TOGAF ADM



TOGAF 9 within System Architect

- **Out of the box TOGAF 9 implementation**

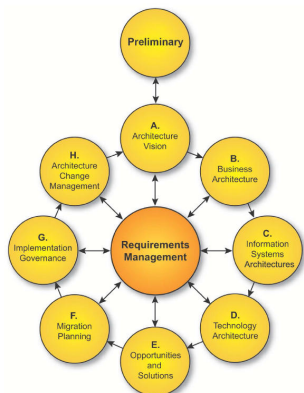
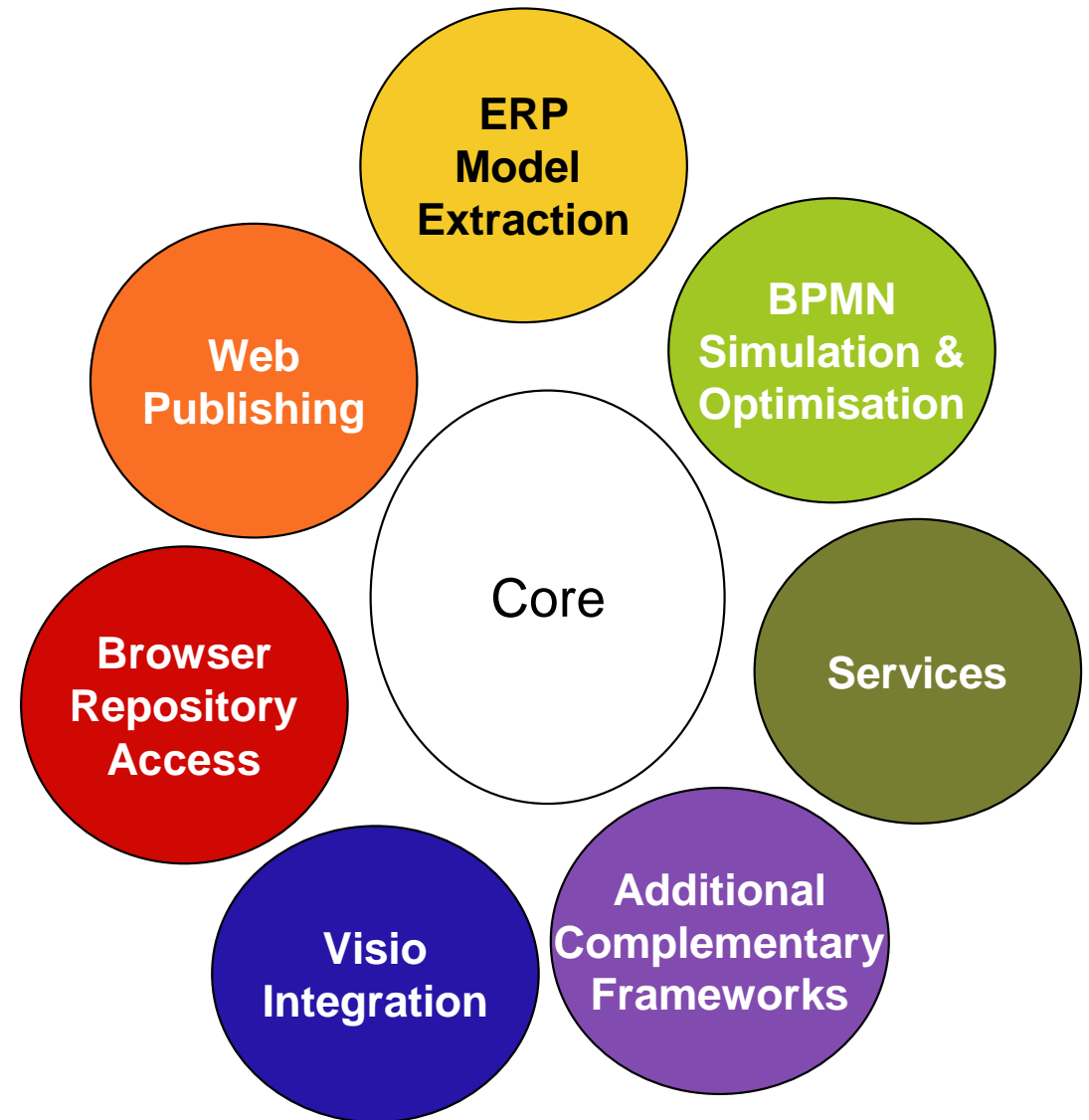
- ▶ Catalogs, Matrices, Views
- ▶ Content metamodel supporting core
- ▶ Switchable metamodel extensions



TOGAF 9 within System Architect

Additional Extensions from IBM

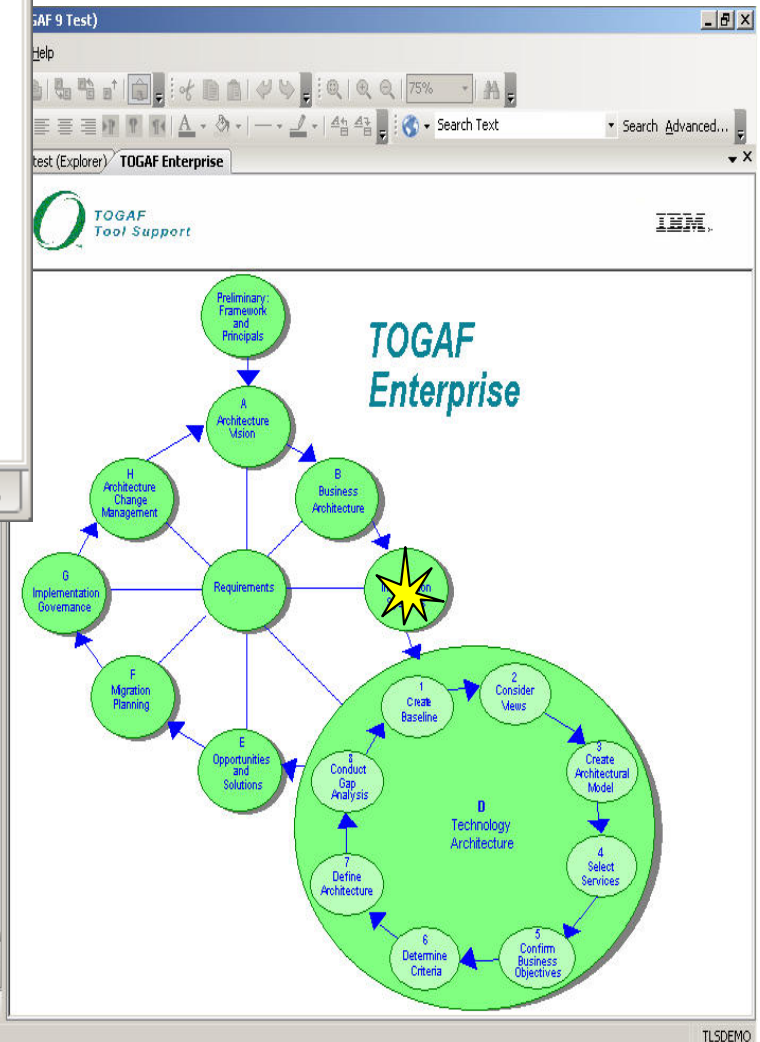
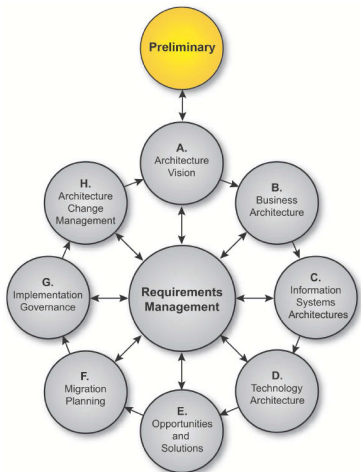
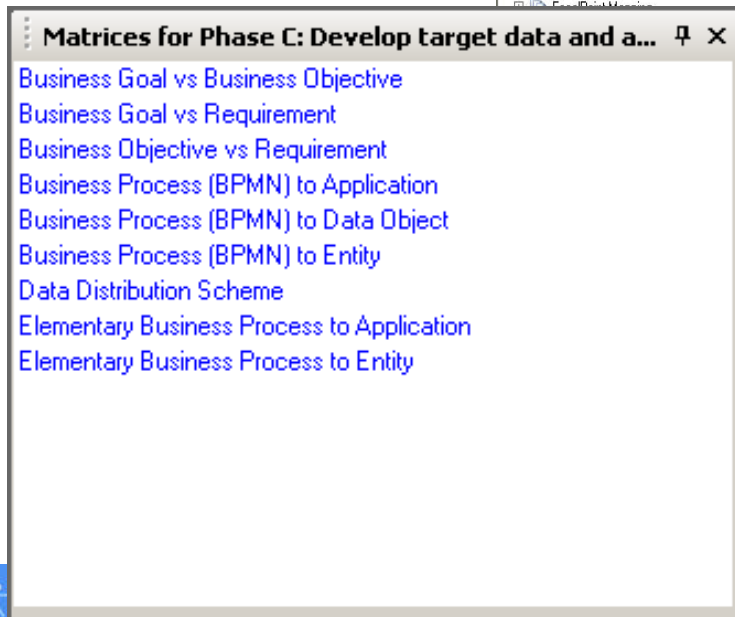
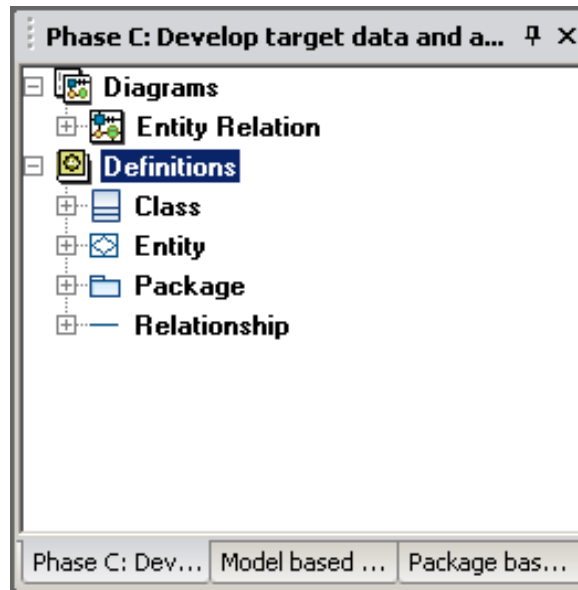
- ▶ SA/ERP
- ▶ SA Simulator III
- ▶ iRMA
- ▶ Process Integrator
- ▶ SA/XT
- ▶ SA/Publisher
- ▶ ...



TOGAF 9 within System Architect

Framework Manager

- ▶ Interactive
- ▶ Customisable



TOGAF 9 within System Architect

- **Customised explorer views**
 - ▶ Correlate with TOGAF 9 Viewpoints
 - Business Footprint Diagram
 - Class Hierarchy Diagram
 - Data Dissemination Diagram
 - ...

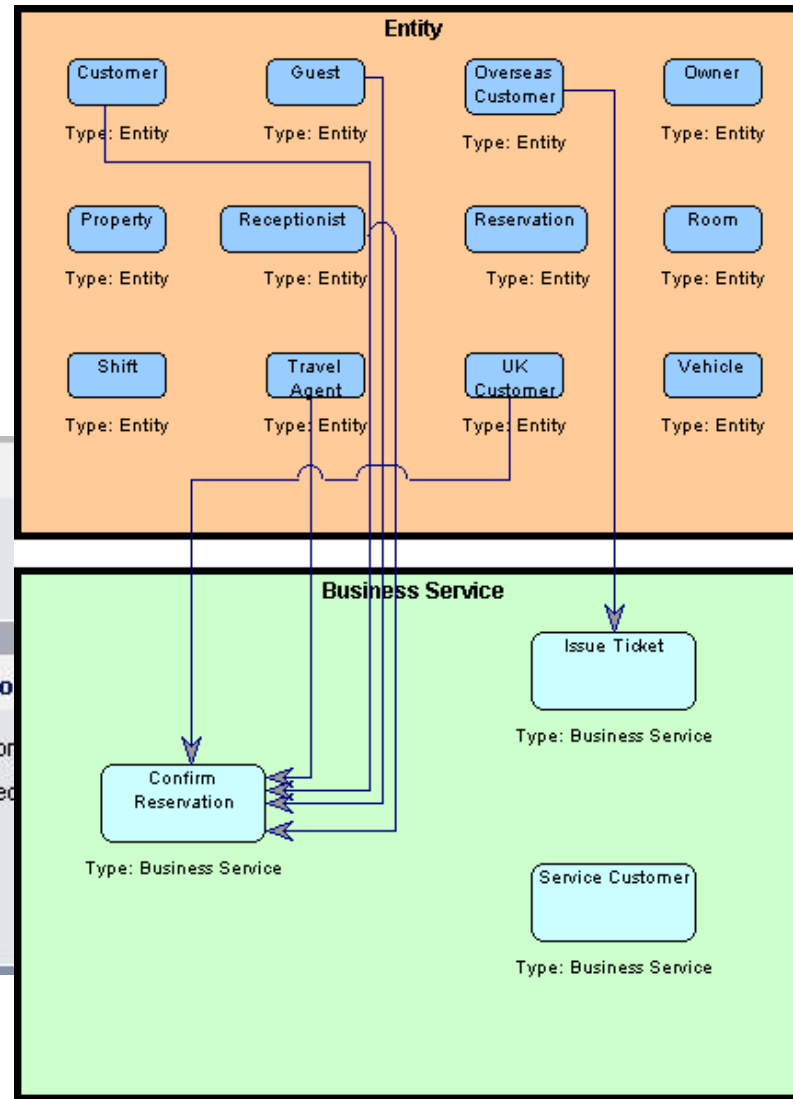
- Viewpoints also correspond to
 - ▶ Matrices
 - ▶ Explorer listings
 - ▶ Diagrams etc.

Explorer Object Report

- ▶ Business Services
- ▶ Entities

Explorer Relationship Report

- ▶ All Immediate Uses Relations
- ▶ Business Processes Related
- ▶ Business Service to Entity
- ▶ Diagram Depicts
- ▶ IDEF0 Hierarchies



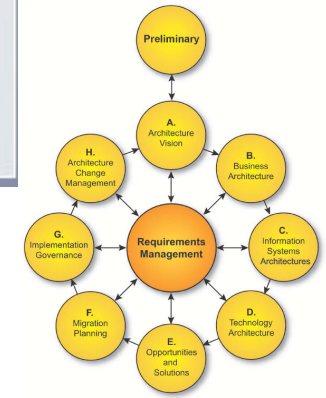
on Diagram

ct Diagram

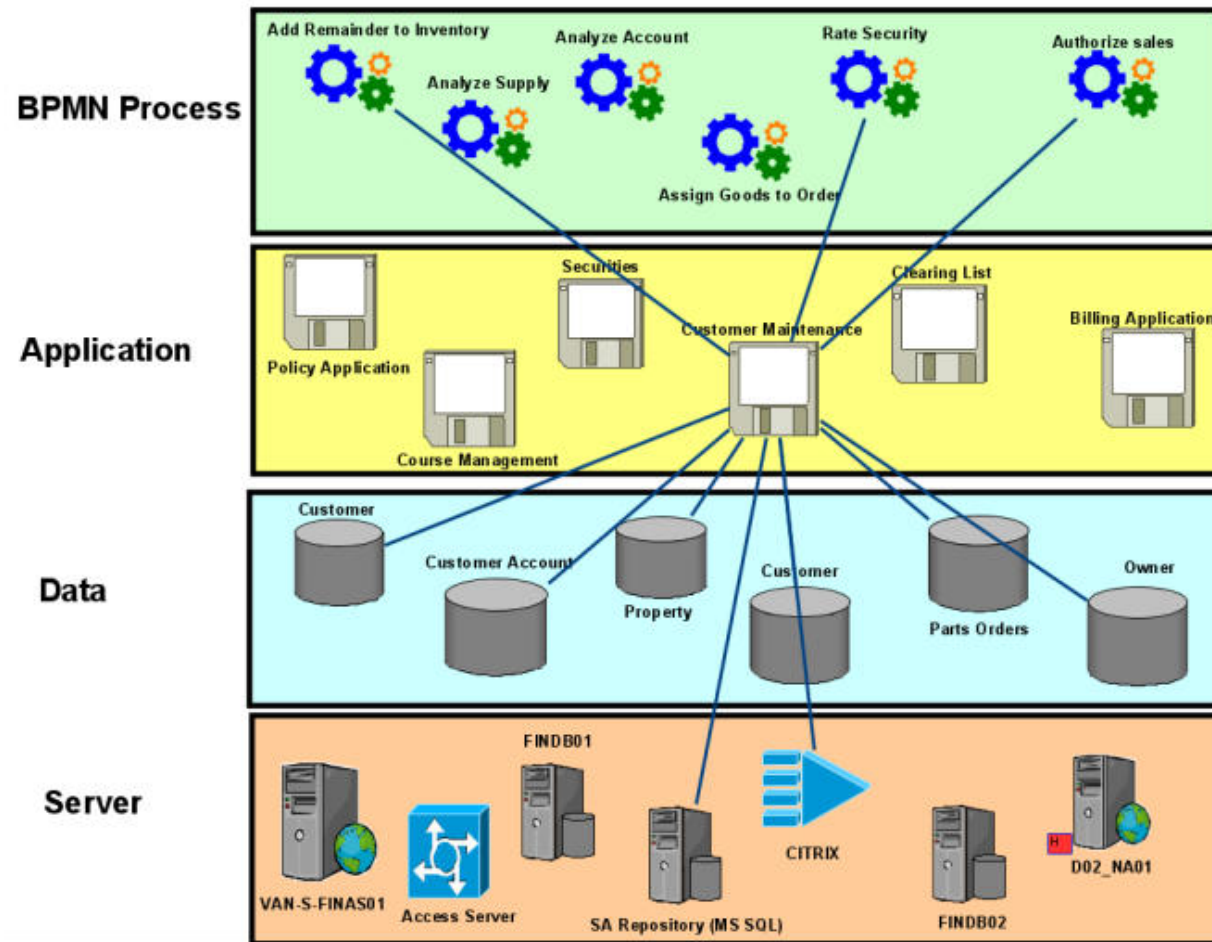
Information Diagram

Diagram

Diagram



Visualize the enterprise and the impact of change



Understand enterprise strategies and their implementation
Understand how infrastructure changes impact the business risk
Understand projects' dependencies and impacts on the organization



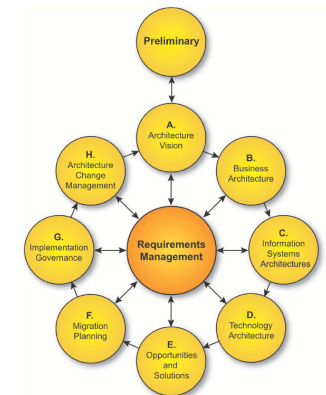
TOGAF 9 within System Architect

Document production

- ▶ IBM Rational Publishing Engine
- ▶ WYSIWIG Editor
- ▶ Multiple Data Sources
- ▶ Consistent SDLC Publishing

The screenshot shows the System Architect interface with a service architecture diagram. A blue arrow points from the diagram to a Microsoft Word document titled '21st Century Airlines.doc'. The Word document displays a '2.1 Enterprise Technology Frameworks' section with a 'Z1 ETF Tree Diagram - "21st Century Airlines"' table. A 'Report Generator...' menu is open, showing options like 'Word Reports', 'HTML Reports...', and 'Report Server Manager...'. A 'TOGAF Enterprise' menu is also visible, listing various report types such as 'Audit', 'Business Enterprise Reports', 'Diagrams', 'BPMN', 'Physical Model Reports', 'Object Model Reports', 'Logical Model Reports', 'IDEF Reports', and 'Structured Reports'.

This screenshot shows a 'Report Generator...' menu with a 'Word Reports' sub-menu. A 'TOGAF Enterprise' menu is also visible, listing various report types such as 'Audit', 'Business Enterprise Reports', 'Diagrams', 'BPMN', 'Physical Model Reports', 'Object Model Reports', 'Logical Model Reports', 'IDEF Reports', and 'Structured Reports'. A 'Learn System Architecture' section is also present, with a 'Take the Quick Start Tutorial. Take the Method Tutorial.' link and a 'Learn More' link.

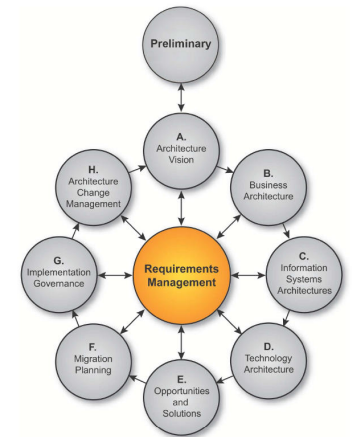


TOGAF 9 within System Architect

- Requirements Management with IBM Rational DOORS

The screenshot illustrates the integration of IBM Rational DOORS with System Architect. It shows a BPMN process diagram for 'Reservations (Business Process)' with a highlighted section indicating that the 'Business Process diagram sent to DOORS'. Below this, a DOORS Object diagram shows the mapping of process elements to DOORS objects like '1.0-9 Meeting asset procedure', '1.0-12 Asset insurance', and '1.0-10 Asset capitalization'. To the left, a DOORS Requirements table is visible, listing requirements such as '1 Requirements' and '2 Business Process'.

ID	Requirement	Description	Definition	EPFMC
21	1 Requirements			
1	Explain hotel terms to all customers; customer must stay at hotel.			
2	Customer must confirm reservation 48 hours prior to reservation date; reservation request.			
3	2 Business Process			
8	"Check Room for Availability"		Definition	EPFMC Process
9	"Advise Customer"	The Customer is provided the details of the room that will be occupied.	Definition	EPFMC Process
10	"Provide Customer with Reservation Number"	Reservation number is issued to the customer for future reference.	Definition	EPFMC Process
11	"Check Traveler's Credit"		Definition	EPFMC Process
12	"Calculate Room Price"	Calculation of price varies, depending on group rate specials, promotions, how long will the traveler be staying, etc.	Definition	EPFMC Process
15	"Notify Traveler of Availability"	The hotel reservation database found no rooms available for the dates the Traveler specified.	Definition	EPFMC Process
16	"Provisionally Book Room"	The room is temporarily on hold for the customer for the date selected.	Definition	EPFMC Process
17	"Customer Rejects Terms"		Definition	EPFMC Process
18	"Take Traveler Details"		Definition	EPFMC Process
19	"Store Customer Details"		Definition	EPFMC Process
2	"Traveler Agrees to Terms"	The customer accepts the room price, and supplies payment details.	Definition	EPFMC Process

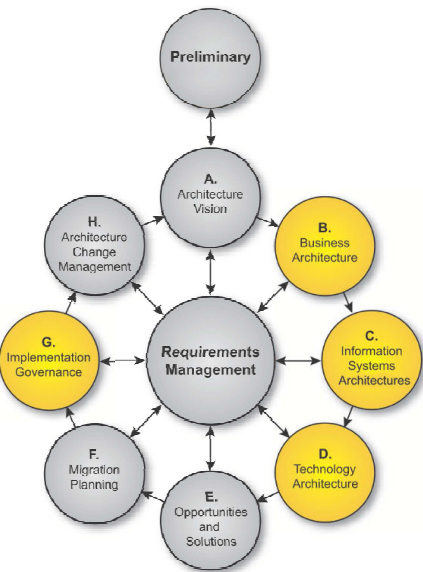


TOGAF 9 within System Architect

- **Migration Planning**
- **EA Portfolio Management with IBM Rational Focal Point**
 - ▶ Manage the Catalog in System Architect
 - ▶ Collaboratively Prioritise & Plan in Focal Point
 - ▶ Highlight the results in System Architect
- **Part of your EA Capability**
 - ▶ Governance body
 - ▶ Business operations

TOGAF 9 within System Architect

- **Solution development with**
 - ▶ IBM Rational Software Architect (for IT)
 - ▶ WebSphere Business Modeler (for BPM)
 - ▶ IBM Rational Rhapsody (for embedded/Real Time)

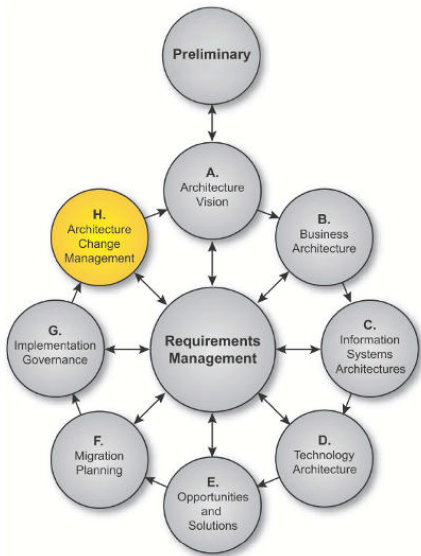


This block contains several screenshots from IBM Rational software. The top-left screenshot shows the 'System Architect' interface with a 'TOGAF Enterprise' diagram, which is a complex network of interconnected nodes representing different architectural layers. The bottom-left screenshot shows the 'Rational Software Architect' interface with a project explorer and a diagram showing an 'Initial' state and a transition to a 'Menu' state with actions like 'BROWSE' and 'ADD'. The right side of the block shows multiple overlapping windows from 'WebSphere Business Modeler', displaying various BPMN diagrams and configuration panels for business process modeling.

TOGAF 9 within System Architect

Architecture Change Management with IBM Rational Change

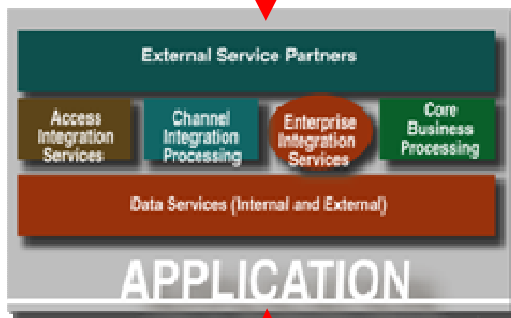
The screenshot shows the System Architect application interface. The main window displays a TOGAF Enterprise architecture diagram with a central 'Requirements' node and surrounding nodes: Preliminary Framework and Principles, A Architecture Vision, B Business Architecture, C Information Systems Architectures, D Technology Architecture, E Opportunities and Solutions, F Migration Planning, G Implementation Governance, and H Architecture Change Management. A web browser window in the foreground shows the Telelogic Pyramid website, which includes a navigation pane, a 'Vision' document view, and a 'Work Item 7: Add screen saver page to web site' window.



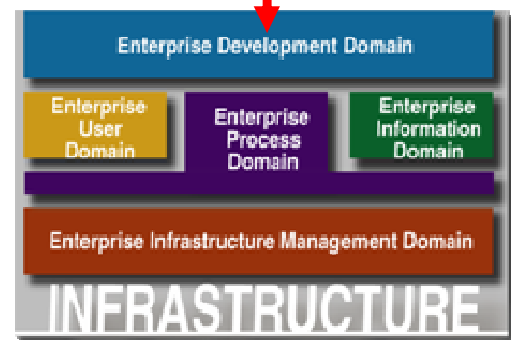
TOGAF 9 supported stepwise transformation of business, applications & operational systems.



Deliver incremental business transformation via a reusable, component-based business



Achieve business efficiency and IT cost efficiency via a **Service Oriented Architecture** (with appropriate packages in some domains, current application transformation, SOA business service solutions)



Achieve IT service delivery speed, flexibility and cost efficiency via proven IT service delivery management processes, standards, methods and robust technologies



What can we use it for?

- Mergers and Acquisitions - Asset Consolidation
- Business Continuity Management and Security
- Business and Technology planning
- Governance, Compliance and Regulation
- Outsourcing / Offshoring
- Business/IT Alignment (44%*)

*The Open Group TOGAF 9 Survey



Where do We Go From Here?

- How do we get started?
- This is far too big for us to do
- How do we progress our level of maturity?
- Do we have to do the whole Enterprise for this to be of value?
- How can we ensure that our organisation will benefit from an EA initiative?
- How can we deploy at reasonable cost and with sufficient commitment?



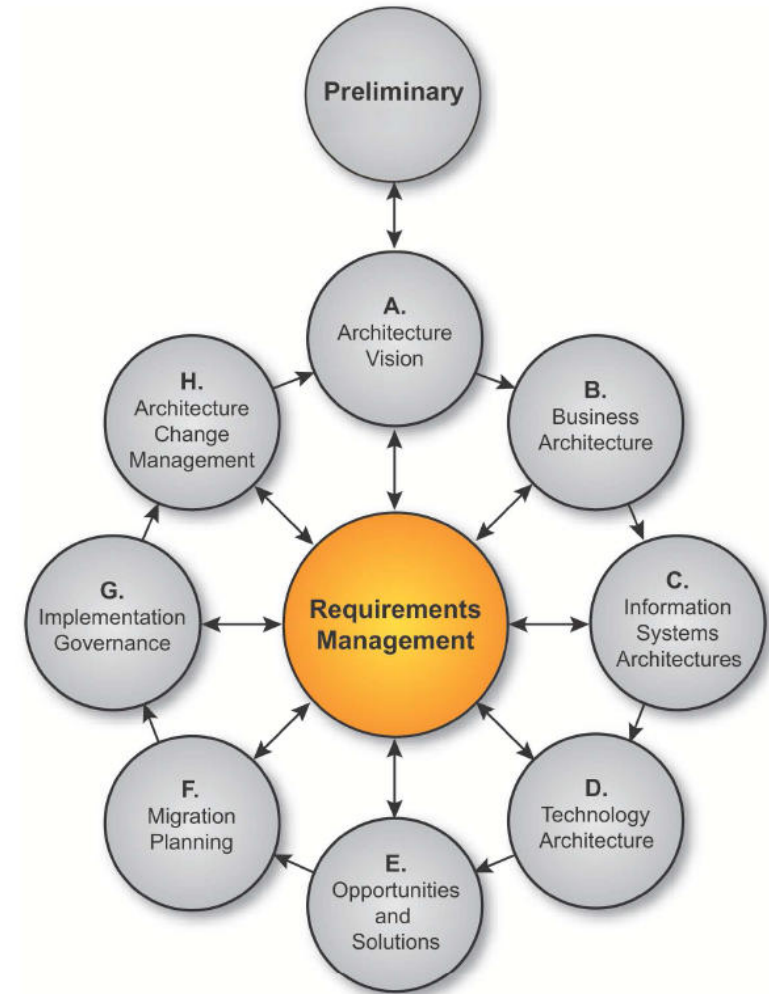
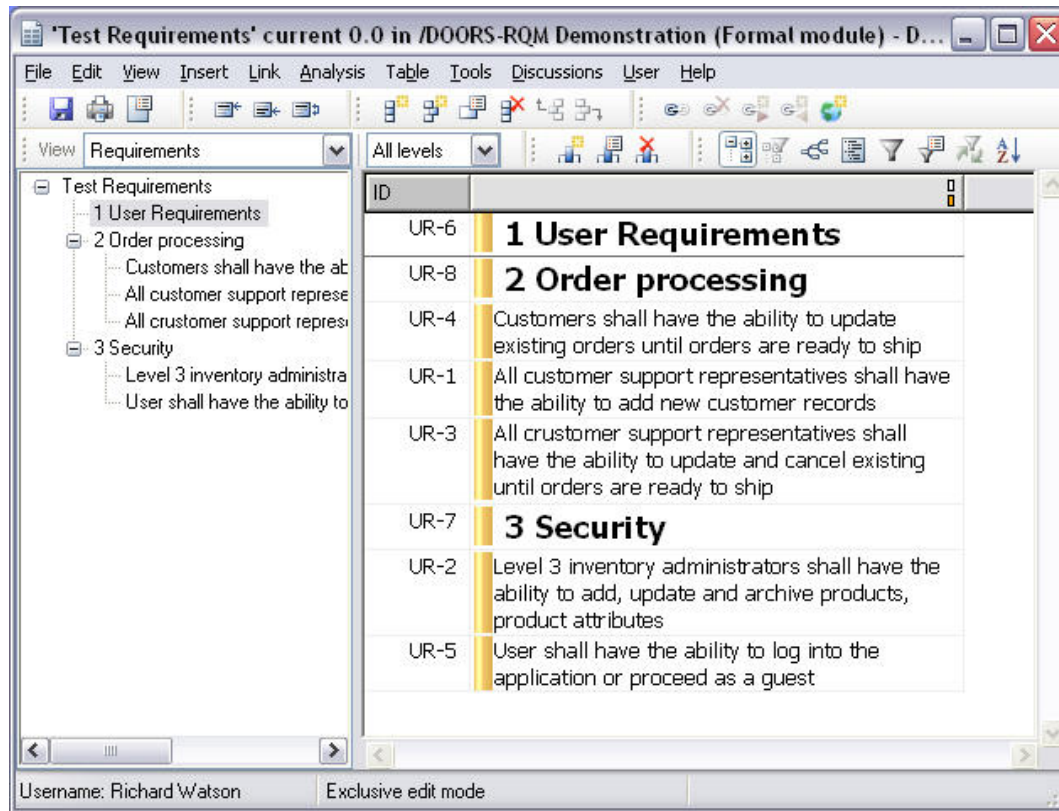
Recommended Next Steps

- Find out more about TOGAF
 - ▶ Training available
- Do it in conjunction with an Enterprise Architecture Tool
 - ▶ Find out about System Architect!
- Identify a problem area in your organisation
 - ▶ Difficult questions
 - ▶ Business transformation
 - ▶ IT refresh
- Engage IBM Services to help
 - ▶ Enterprise Architecture Quick Start
- Determine an appropriate level of governance
- Get senior level sponsorship
- Beef up your requirements (BA) practice



Invest in your Requirements Management Practice

- Rational for Requirements Management
- Requirements are central to everything



System Architect EA QuickStart - Overview

- Tightly scoped enterprise architecture project
- Delivered onsite by professional IBM services consultants
- Combines senior-level IBM consulting expertise with IBM System Architect software
- Helps your organisation form the basis of a successful enterprise-wide EA initiative.
- Can be delivered in conjunction with your TOGAF initiative



System Architect EA QuickStart - Advantage

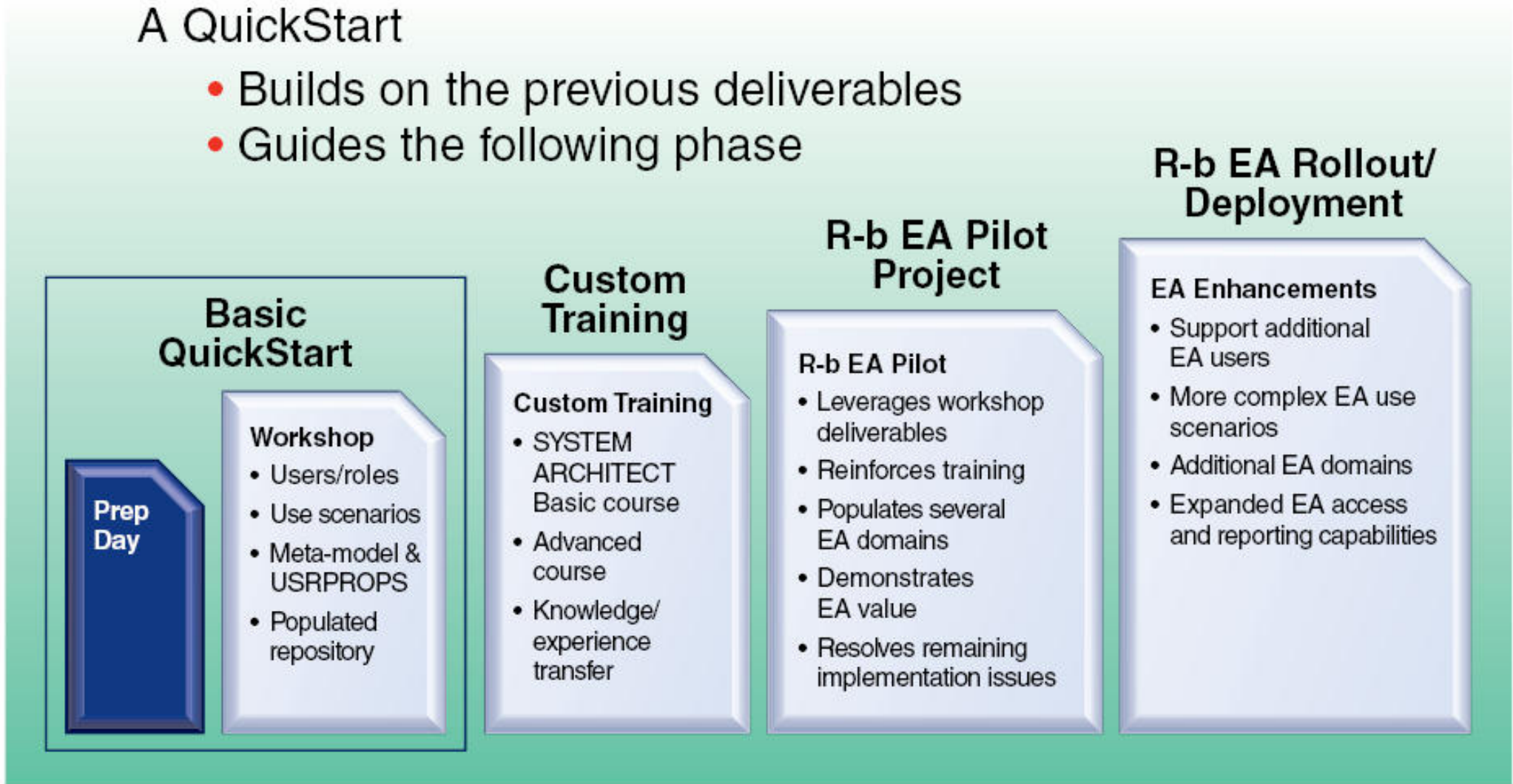
- The EA QuickStart Advantage
 - ▶ **Develop** a working repository that demonstrates alignment and gaps through a vertical slice of virtually all areas of the enterprise, from strategy to infrastructure.
 - ▶ **Learn** roles and processes by actively participating in *the project*.
 - ▶ **Create** usable and extensible EA content and analysis *capabilities*.
 - ▶ **Demonstrate** a tangible ROI in a short-term project.
 - ▶ **Build** support for EA among sponsors and stakeholders.
 - ▶ **Establish** the next steps for branching into other areas.



System Architect EA QuickStart - Overview

A QuickStart

- Builds on the previous deliverables
- Guides the following phase



SA EA QuickStart approach consists of the basic QuickStart, custom training, Repository-based (R-b) EA pilot project and rollout/deployment phases.



System Architect EA QuickStart – 4 Phases

- **Basic QuickStart**
 - ▶ *Introduce users to their roles*
 - ▶ *Help gather requirements*
 - ▶ *Identify key artifacts*
 - ▶ *Teach the basics of enterprise architecture.*
- **Custom training**
 - ▶ *Basic course to gain valuable experience using Telelogic System Architect*
 - ▶ *Evolves into more focused and advanced training.*
- **R-b EA pilot project**
 - ▶ *Reinforces training*
 - ▶ *Leverages workshop deliverables to populate several domains*
 - ▶ *Demonstrates the value of a well-developed EA.*
- **R-b EA rollout/deployment**
 - ▶ *Access to the EA is expanded*
 - ▶ *Reporting capabilities leveraged to publish key information in a Web site format*



System Architect EA QuickStart – Critical Factors

■ People

- ▶ *Users learn key roles and responsibilities*
- ▶ *Actively participate in the project*
- ▶ *Focus on high-value scenarios*
- ▶ *Users define their needs to drive EA capability development.*

■ Process

- ▶ *Users create their own modeling environment and its underlying structure.*
- ▶ *EA configuration management and versioning*
- ▶ *Develop and define critical meta model requirements*
- ▶ *Customise new user capabilities interactively.*

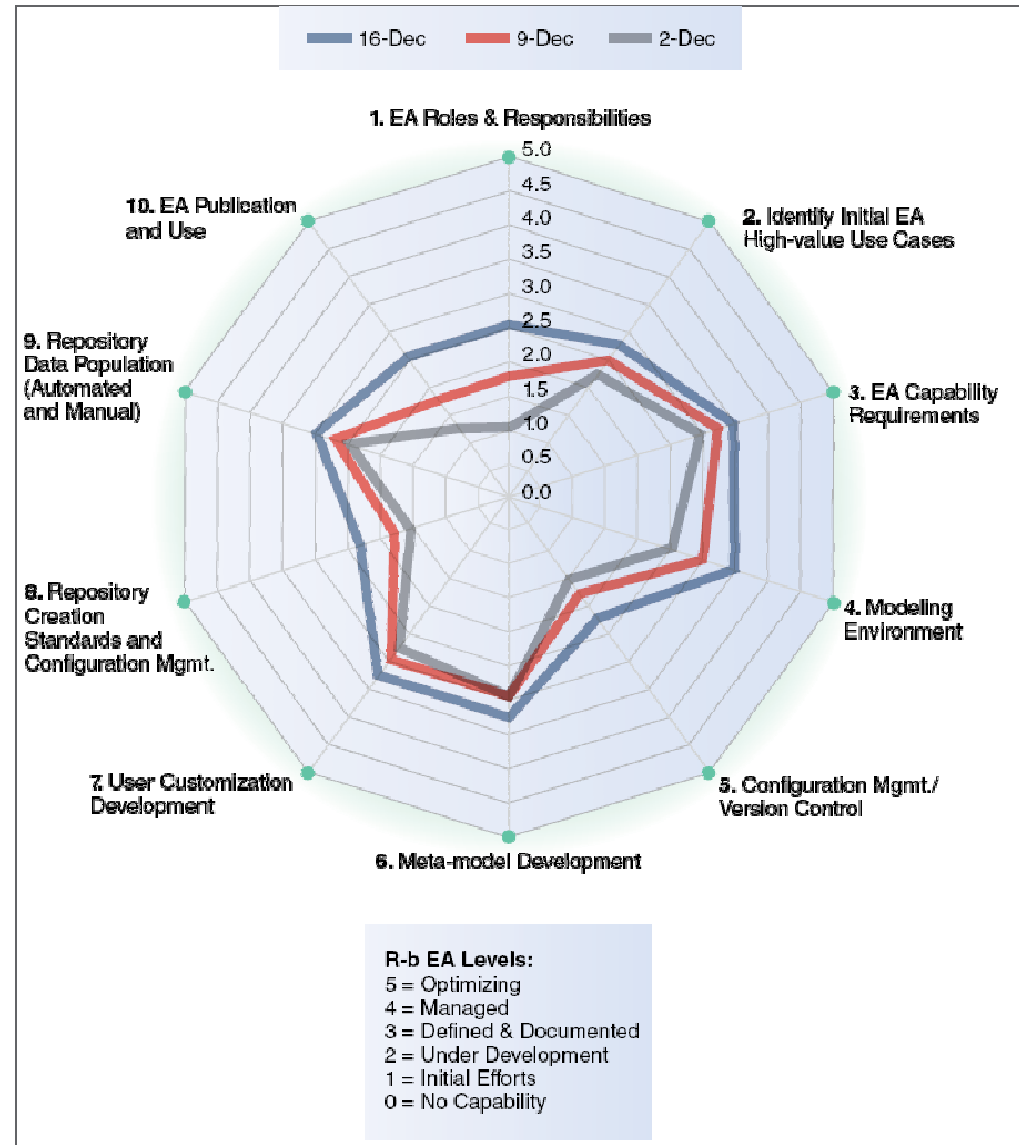
■ Technology

- ▶ *Develop a repository management strategy*
- ▶ *Automate data population*
- ▶ *Utilise best-practice data entry to help ensure integrity*
- ▶ *Publish EA to maximise value across the entire organisation.*



Designed to measure and improve EA capabilities

- EA roles and responsibilities
- Identify initial high value EA use cases
- EA Capability requirements
- Modeling environment
- Configuration management/version control
- Meta-model development
- User customisation development
- Repository creation standards and configuration management
- Repository data population (auto & manual)
- EA publication & use



The future of TOGAF with IBM Rational

- IBM is committed to supporting TOGAF within System Architect
- IBM is a platinum member of the Open Group
- IBM has contributed to the development of TOGAF 9 and is continuing to do so
- IBM Rational is leveraging IBM methods as extensions to TOGAF 9
- TOGAF 9 provides a foundation for tool connectivity within IBM and outside of IBM
- IBM organisations are collaborating internally and with partners to ensure a consistent approach to TOGAF



Questions

