TOGAF

Version 9 Enterprise Edition

Module 20A
Phase C
Application Architecture – Catalogs, Matrices and Diagrams

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Module Objectives

The objectives of this module are to understand:

- The Catalogs, Matrices and Diagrams of Phase C, Application Architecture
- What they consist of
- How they are used

TOGAF 9 Artifacts

Preliminary Phase

- Principles catalog

Phase A, Architecture Vision

- Stakeholder Map matrix
- Value Chain diagram
- Solution Concept diagram

Phase B, Business Architecture

- Organization/Actor catalog
- Driver/Goal/Objective catalog
- Role catalog
- Business Service/Function catalog
- Location catalog
- Process/Event/Control/Product catalog
- Contract/Measure catalog
- Business Interaction matrix
- Actor/Role matrix
- Business Footprint diagram
- Business Service/Information diagram
- Functional Decomposition diagram
- Product Lifecycle diagram
- Goal/Objective/Service diagram
- Use-Case diagram
- Organization Decomposition diagram
- Process Flow diagram
- Event diagram

Phase C, Data Architecture

- Data Entity/Data Component catalog
- Data Entity/Business Function matrix
- System/Data matrix
- Class diagram
- Data Dissemination diagram
- Data Security diagram
- Class Hierarchy diagram
- Data Migration diagram
- Data Lifecycle diagram

Phase C, Application Architecture

- Application Portfolio catalog
- Interface catalog
- System/Organization matrix
- Role/System matrix
- System/Function matrix
- Application Interaction matrix
- Application Communication diagram
- Application and User Location diagram
- System Use-Case diagram
- Enterprise Manageability diagram
- Process/System Realization diagram
- Software Engineering diagram
- Application Migration diagram
- Software Distribution diagram

Phase D, Technology Architecture

- Technology Standards catalog
- Technology Portfolio catalog
- System/Technology matrix
- Environments and Locations diagram
- Platform Decomposition diagram
- Processing diagram
- Networked Computing/Hardware diagram
- Communications Engineering diagram

Phase E. Opportunities & Solutions

- Project Context diagram
- Benefits diagram

Requirements Management

- Requirements catalog

Catalogs, Matrices and Diagrams

Catalogs

- Application Portfolio catalog
- Interface catalog

Matrices

- System/Organization matrix
- Role/System matrix
- System/Function matrix
- Application Interaction matrix

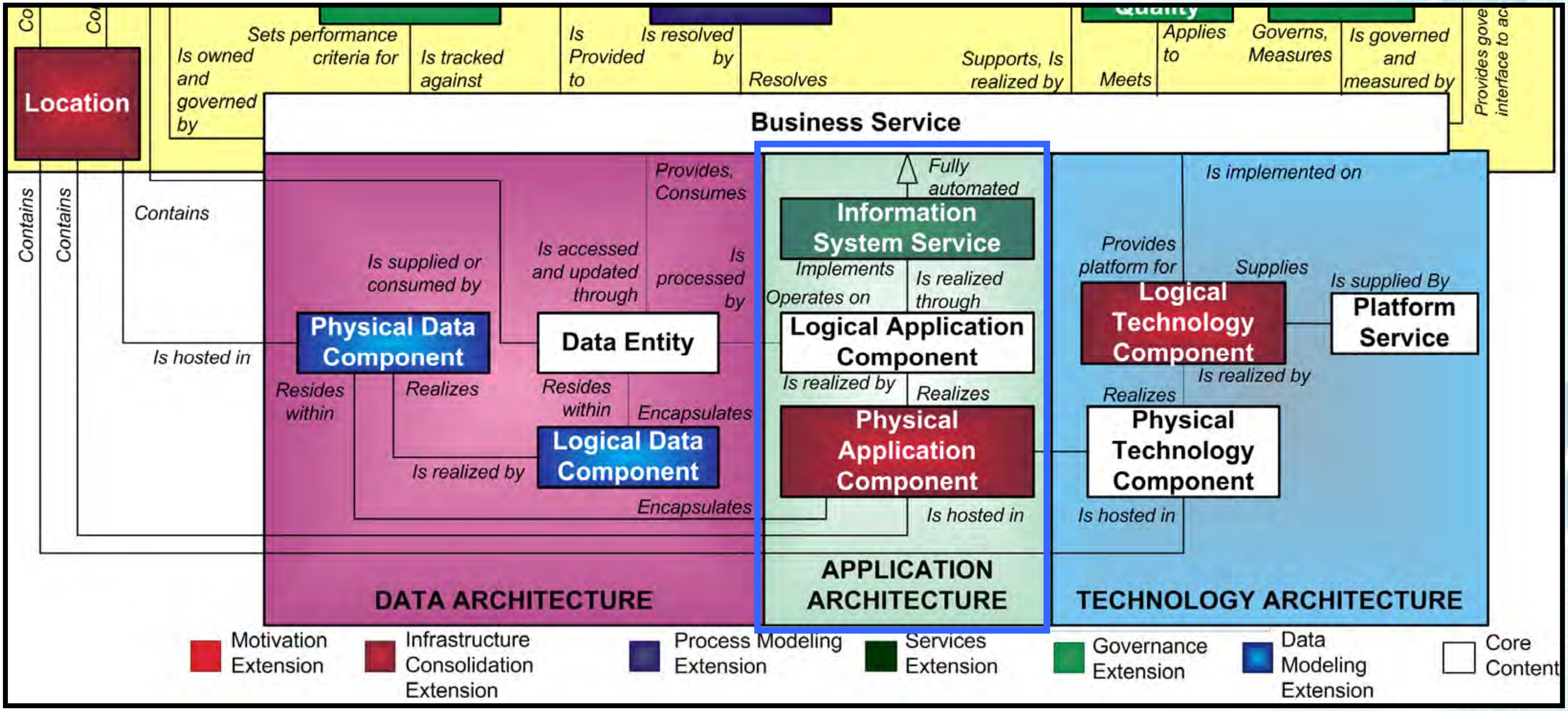
Diagrams

- Application Communication diagram
- Application and User Location diagram
- System Use-Case diagram
- Enterprise Manageability diagram
- Process/System Realization diagram
- Software Engineering diagram
- Application Migration diagram
- Software Distribution diagram

Catalogs

Catalog	Purpose
Application Portfolio Catalog	To identify and maintain a list of all the applications in the enterprise. This list helps to define the horizontal scope of change initiatives that may impact particular kinds of applications. An agreed Application Portfolio allows a standard set of applications to be defined and governed. It contains the following metamodel entities: •Information System Service •Logical Application Component •Physical Application Component
Interface Catalog	The purpose of the Interface catalog is to scope and document the interfaces between applications to enable the overall dependencies between applications to be scoped as early as possible. It contains the following metamodel entities: •Logical Application Component •Physical Application Component •Application *communicates with* application relationship

Exercise



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Matrices

- System/Organization matrix
- Role/System matrix
- System/Function matrix
- Application Interaction matrix

System/Organization Matrix

- The purpose of this matrix is to depict the relationship between systems (i.e., application components) and organizational units within the enterprise.
- The mapping of the Application Component-Organization Unit relationship is an important step as it enables the following to take place:
  - Assign usage of applications to the organization units that perform business functions
  - Understand the application support requirements of the business services and processes carried out by an organization unit
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created
  - Define the application set used by a particular organization unit

Example System/Organization Matrix

APPLICATION (Y-AXIS) AND ORGANISATION UNIT (X-AXIS)	CUSTOMER SERVICES	PROCUREMENT AND WAREHOUSING	HR	CORPORATE FINANCE
SAP HR	X	X	X	
SIEBEL	X	X		
SAP FINANCIALS	X	X		X
PROCURESOFT	X	X		

Role/System Matrix

- The purpose of the Role/System matrix is to depict the relationship between systems (i.e., application components) and the business roles that use them within the enterprise.
- The mapping of the Application Component-Role relationship is an important step as it enables the following to take place:
  - Assign usage of applications to the specific roles in the organization
  - Understand the application security requirements of the business services and processes supporting the function, and check these are in line with current policy
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created
  - Define the application set used by a particular business role; essential in any move to role-based computing

Example Role/System Matrix

APPLICATION (Y-AXIS) AND FUNCTION (X-AXIS)	CALL CENTRE OPERATOR	CALL CENTRE MANAGER	FINANCE ANALYST	CHIEF ACCOUNTANT
SAP HR	X	X	X	X
SIEBEL	X	X		
SAP FINANCIALS	X	X	X	X
PROCURESOFT	X	X		

System/Function Matrix

- The purpose of the System/Function matrix is to depict the relationship between systems (i.e., application components) and business functions within the enterprise.
- The mapping of the Application Component-Function relationship is an important step as it enables the following to take place:
  - Assign usage of applications to the business functions that are supported by them
  - Understand the application support requirements of the business services and processes carried out
  - Support the gap analysis and determine whether any of the applications are missing and as a result need to be created
  - Define the application set used by a particular business function

Example System/Function Matrix

APPLICATION (Y-AXIS) AND FUNCTION (X-AXIS)	CALL CENTRE 1ST LINE	WAREHOUSE CONTROL	VACANCY FILLING	GENERAL LEDGER MAINTENANCE
SAP HR	X	X	X	X
SIEBEL	X	X		
SAP FINANCIALS	X	X		X
PROCURESOFT	X	X		

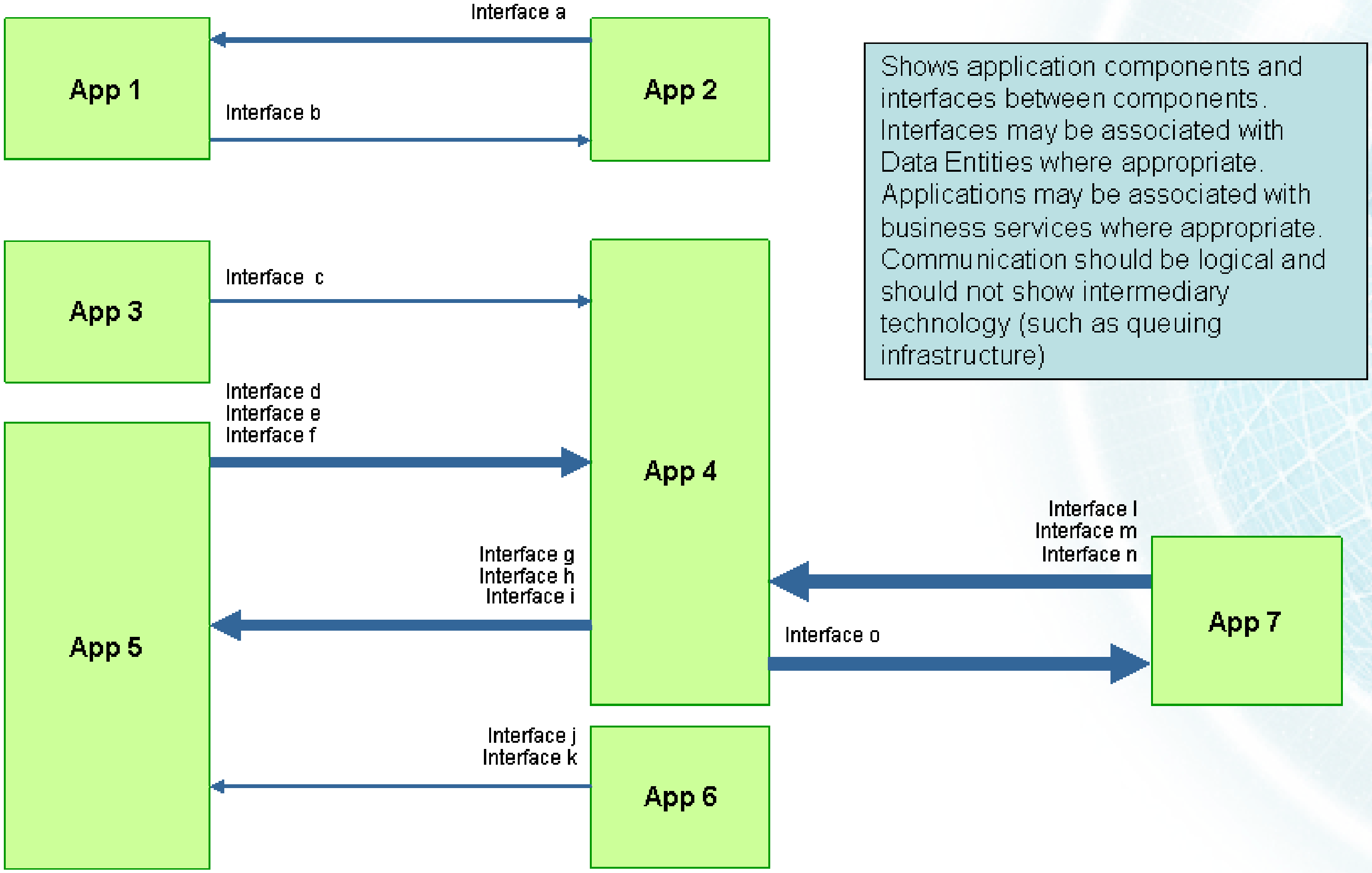
Diagrams

- Application Communication diagram
- N2 model or Node Connectivity diagram
- Application and User Location diagram
- System Use-Case diagram
- Enterprise Manageability diagram
- Process/System Realization diagram
- Software Engineering diagram
- Application Migration diagram
- Software Distribution diagram

Application Communication Diagram

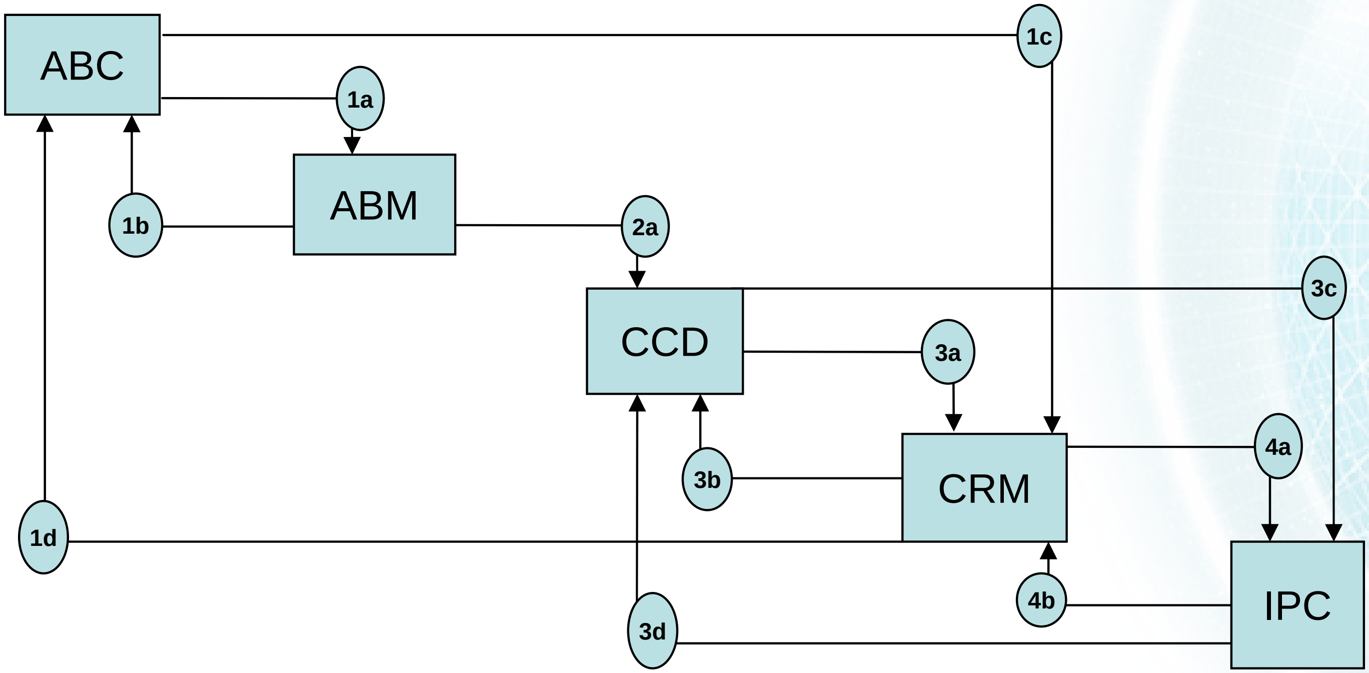
- The purpose of the Application Communication diagram is to depict all models and mappings related to communication between applications in the metamodel entity.
- It shows application components and interfaces between components.
- Communication should be logical and should only show intermediary technology where it is architecturally relevant.

Application Communication Diagram



Shows application components and interfaces between components. Interfaces may be associated with Data Entities where appropriate. Applications may be associated with business services where appropriate. Communication should be logical and should not show intermediary technology (such as queuing infrastructure)

N2 Model



Information Exchange Matrix

LABEL	SOURCE	DESTINATION	DATA ENTITY	EVENT TRIGGERED
1a	▪ ABC	▪ ABM	▪ Sales order (create request)	▪ New sales order from front end
1b	▪ ABM	▪ ABC	▪ Sales order (confirm create)	▪ Order created in the backend ERP system
2a	▪ ABM	▪ CCD	▪ Product catalog	▪ Subscribe/Publish timer

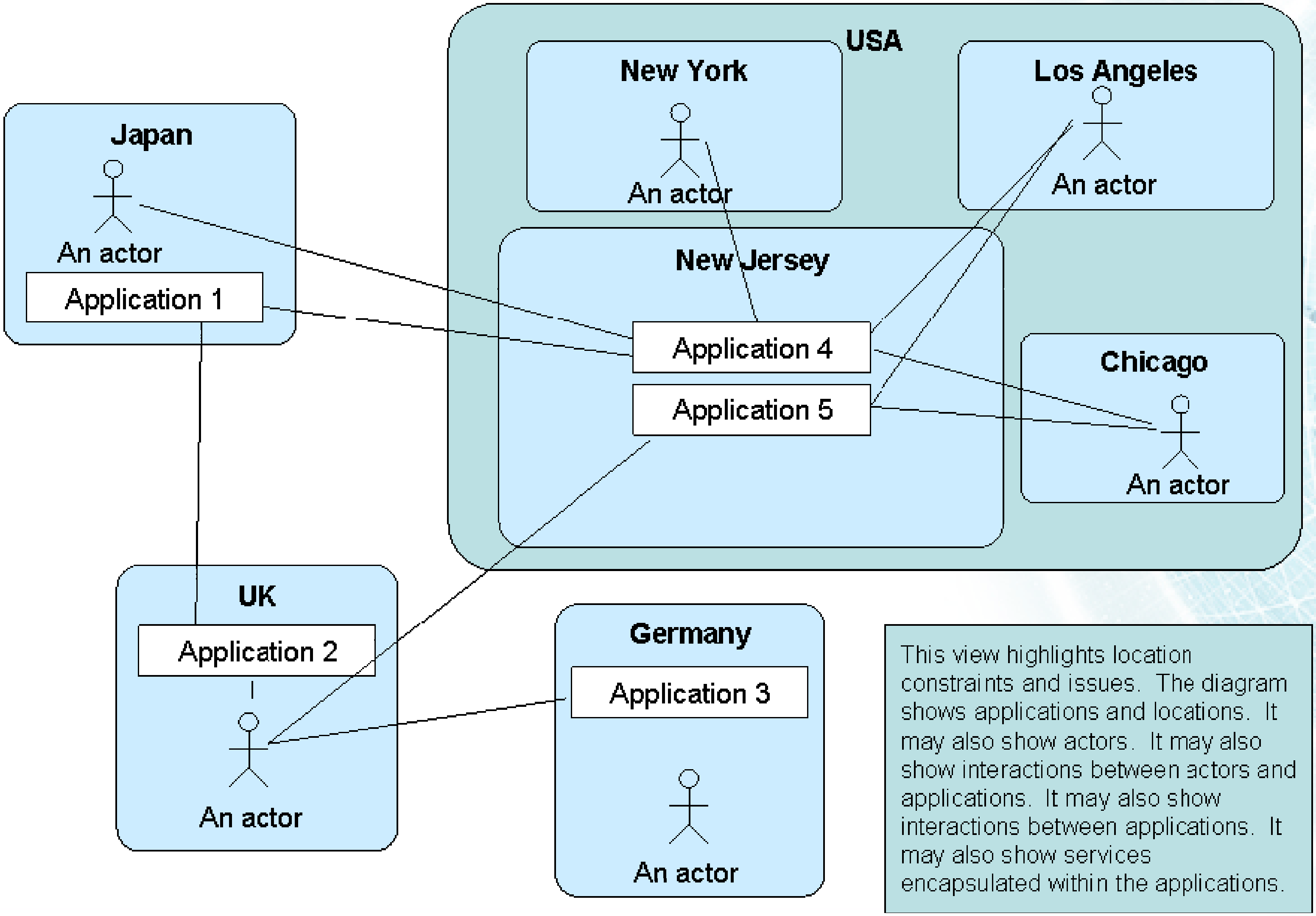
Application & User Location Diagram

- The purpose of this diagram is to clearly depict the business locations from which business users typically interact with the applications, but also the hosting location of the application infrastructure.
- The diagram enables:
  - Identification of the number of package instances needed
  - Estimation of the number and the type of user licenses
  - Estimation of the level of support needed
  - Selection of system management tools, structure, and management system
  - Appropriate planning for the technological components of the business
  - Performance considerations while implementing solutions

Example Application & User Location Diagram (part 1)

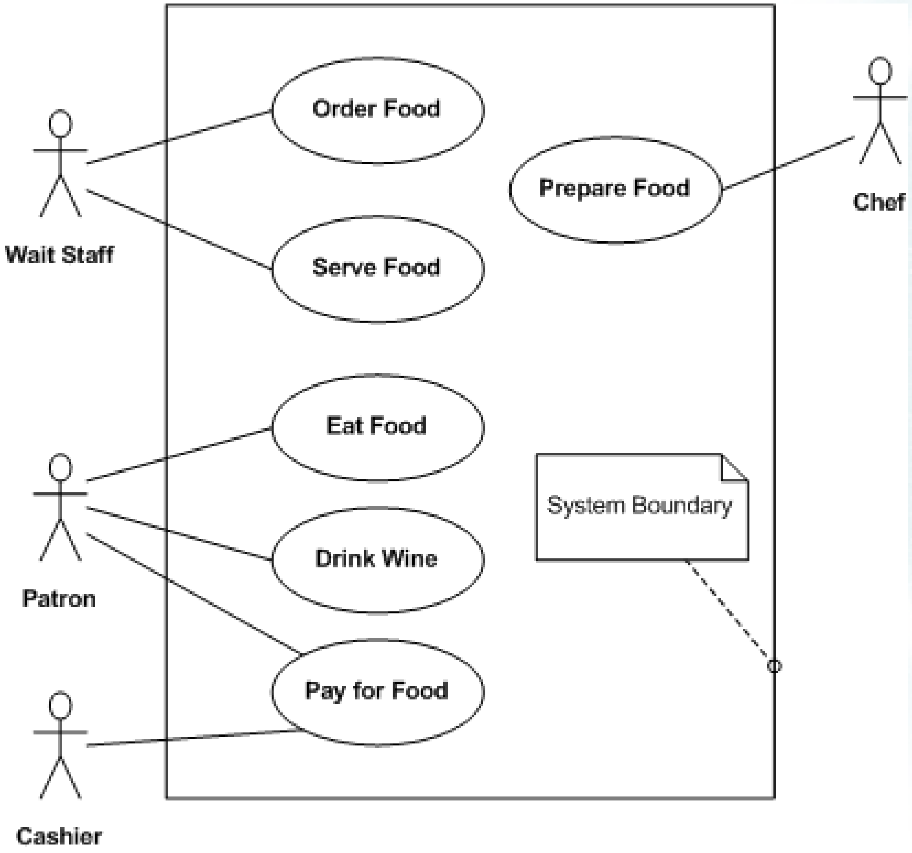
APPLICATION	USER TYPE	INTERNAL, CUSTOMER OR PARTNER	USER BUSINESS LOCATION	LOCATION ADDRESS	ORG UNIT (USER BELONGS TO)
CRM	Developer Super User Administrator	Internal	NA Western Region EMEA Headquarters, UK	Chicago Sears tower office Chicago Downtown office Middlesex, London	NA Sales & Marketing EMEA Sales
SAP R/3	Test Engineers Mechanical Engineers Procurement managers	Internal	Beijing Manufacturing Plant		Manufacturing & logistics

Example Application & User Location Diagram (part 2)



This view highlights location constraints and issues. The diagram shows applications and locations. It may also show actors. It may also show interactions between actors and applications. It may also show interactions between applications. It may also show services encapsulated within the applications.

System Use Case Diagram

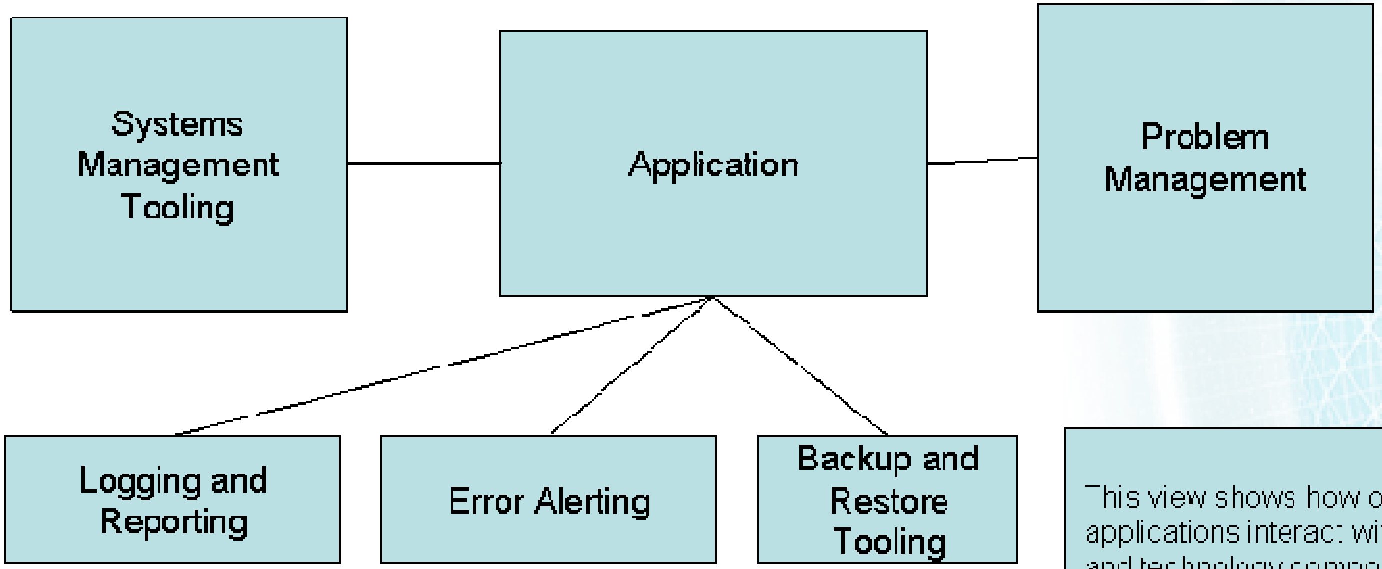


Source: wikipedia.org

Enterprise Manageability Diagram

- The Enterprise Manageability diagram shows how one or more applications interact with application and technology components that support operational management of a solution.
- Analysis can reveal duplication and gaps, and opportunities in the IT service management operation of an organization.

Example Enterprise Manageability Diagram



Systems Management Tooling

Application

Problem Management

Logging and Reporting

Error Alerting

Backup and Restore Tooling

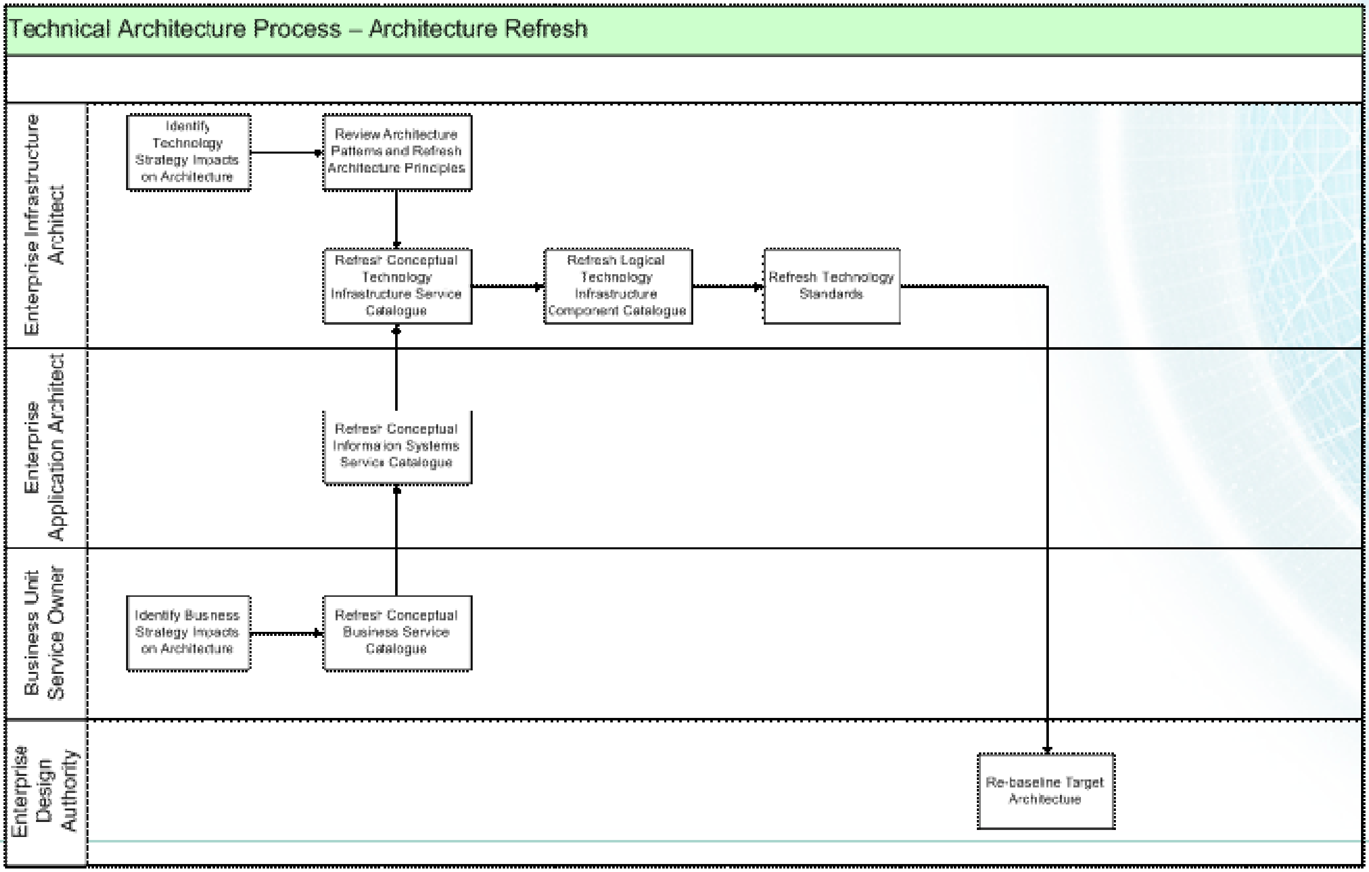
‾his view shows how one or more applications interac: with applicaticn and technology components that support operational management of a solution. This view is really a f lter on the appl cation-applicat on communication view. This diagram may also show support personnel access to administrative functions ɔf the system. This diagram may also address enviror ment migratior , conf guration management etc.

Process/System Realization Diagram

- The purpose of the Process/System Realization diagram is to clearly depict the sequence of events when multiple applications are involved in executing a business process.
- It enhances the Application Communication diagram by augmenting it with any sequencing constraints, and hand-off points between batch and real-time processing.

Example Process/System Realization Diagram

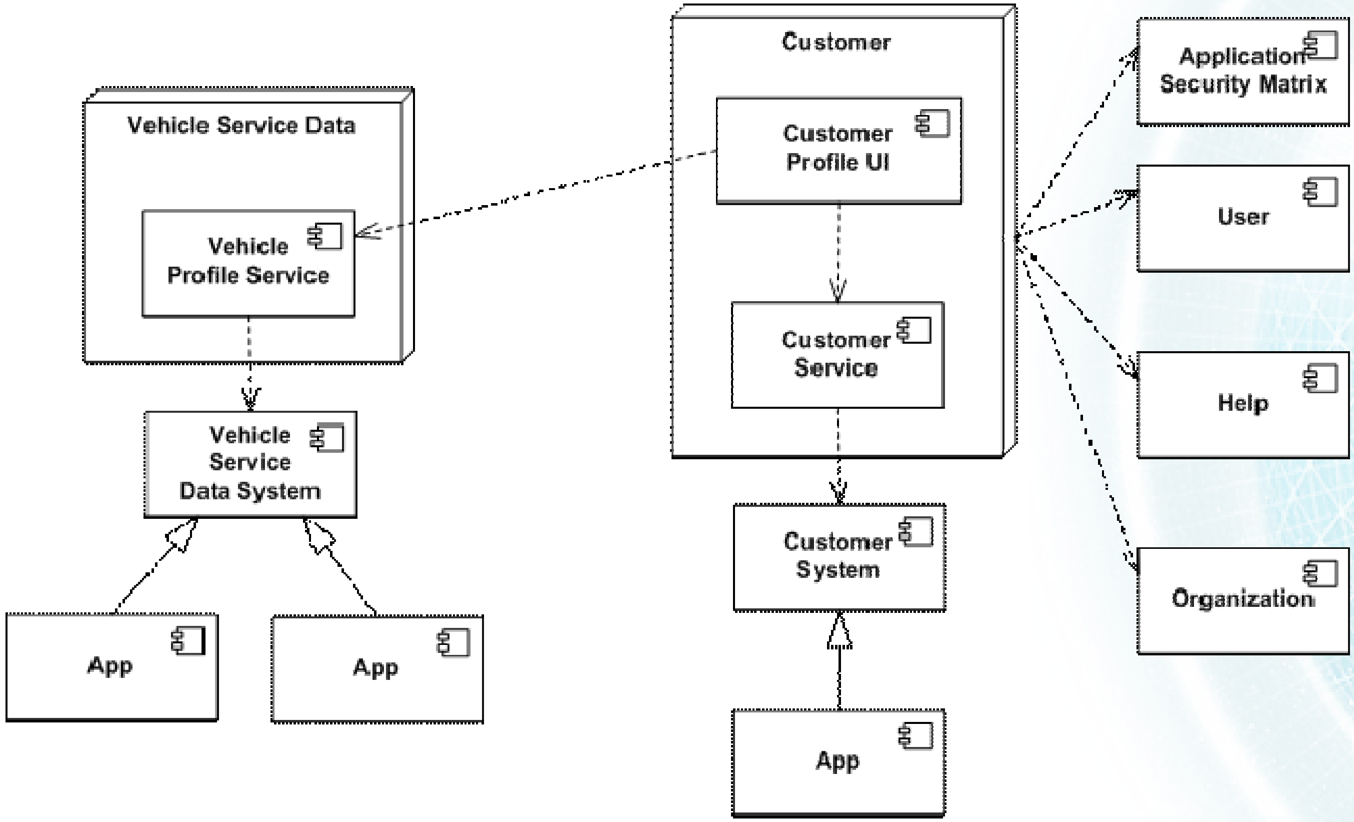
UML sequence (most detail) and activity diagrams (less detail) can be used, or a less formal swimlaned flowchart (least detail). BPMN is also an option. The decision on diagram form will depend on the level of detail and formality. Generally, the non-formal view is best suited to stakeholders, but specific areas of architecture risk need to be addressed in more detail. The diagram can show organisations, actors, application components, data entities and architecturally significant technology components.


Technical Architecture Process – Architecture Refresh
Enterprise Infrastructure Architect
Enterprise Application Architect
Business Unit Service Owner
Enterprise Design Authority
Identify Technology Strategy Impacts on Architecture
Review Architecture Patterns and Refresh Architecture Principles
Refresh Conceptual Technology Infrastructure Service Catalogue
Refresh Logical Technology Infrastructure Component Catalogue
Refresh Technology Standards
Refresh Conceptual Information Systems Service Catalogue
Identify Business Strategy Impacts on Architecture
Refresh Conceptual Business Service Catalogue
Re-baseline Target Architecture

Software Engineering Diagram

- The Software Engineering diagram breaks applications into packages, modules, services, and operations from a development perspective.
- It enables more detailed impact analysis when planning migration stages, and analyzing opportunities and solutions.
- It is ideal for application development teams and application management teams when managing complex development environments.

Example Software Engineering Diagram



Breaks applications into packages, modules, services and operations from a development perspective. May show dependencies between functional components

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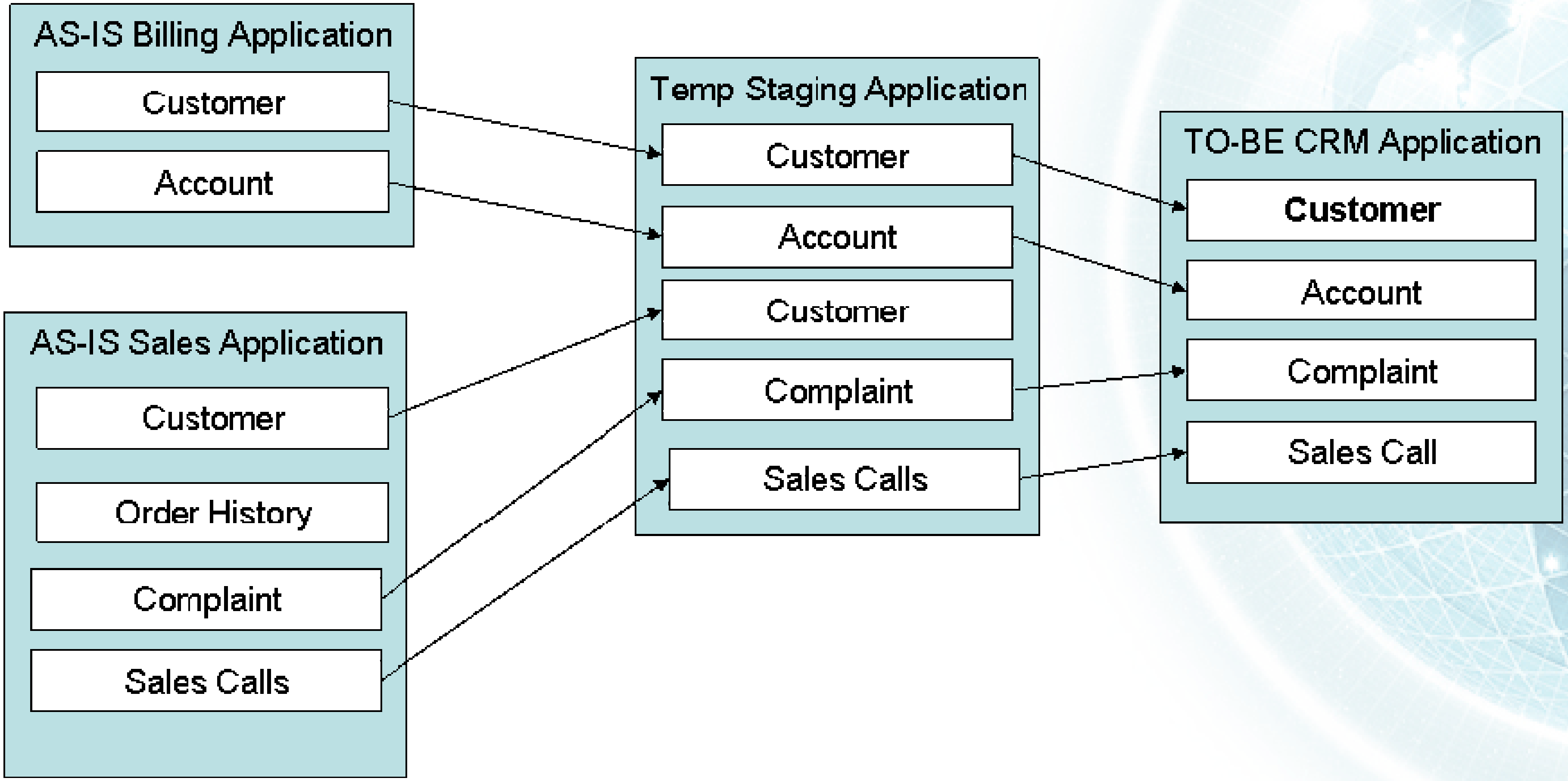
Application/Migration Diagram

- The Application Migration diagram identifies application migration from baseline to target application components.
- It enables a more accurate estimation of migration costs
- It should be used to identify temporary applications, staging areas, and the infrastructure required to support migrations

Example Application/Migration Diagram



Software Distribution Diagram

- This diagram is a composite of the Software Engineering diagram and the Application-User Location diagram.
- Depending on the circumstances, this diagram alone may be sufficient, or may not be needed.