



ISECON 2006

A Case Study: Developing an Architectural Design Description for the Application Viewpoint

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Outline

- Introduction
- Project Context
- Project Charter
- Architecture Approach
- 4+1 RUP views
- Conclusion
- Q&A



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Introduction



- Case study of experience in developing the models of the application viewpoint to produce the Architecture Design Description (ADD)
- Experience on a team project based on a real-world initiative in a global automotive manufacturer
- Team project was part of the requirements of a course in IT System Architecture
- The Application Architecture Viewpoint (AAV) Team followed the S-K Approach to develop the ADD

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Project Context

- Focus is on existing Global Purchasing System (GPS) of the Heavy Vehicle Division of an automotive manufacturer
 - Has a legacy client/server architecture
 - Has dependencies on thick-client software layers
- The Heavy Vehicle Division seeks to
 - Upgrade the Global Purchasing System
 - Deploy a new Global Contract Module.

Project Context cont.

- Who will need access to the new system?
 - 170 existing users
 - 246 future users at distributed locations (assembly plants and office locations)
- The purpose of initiative is to provide all Global Purchasing System users with
 - Required minimum hardware and software prior to implementing the new release of the system
 - Ensure that current users have successful access to the new Global Contract feature and related information

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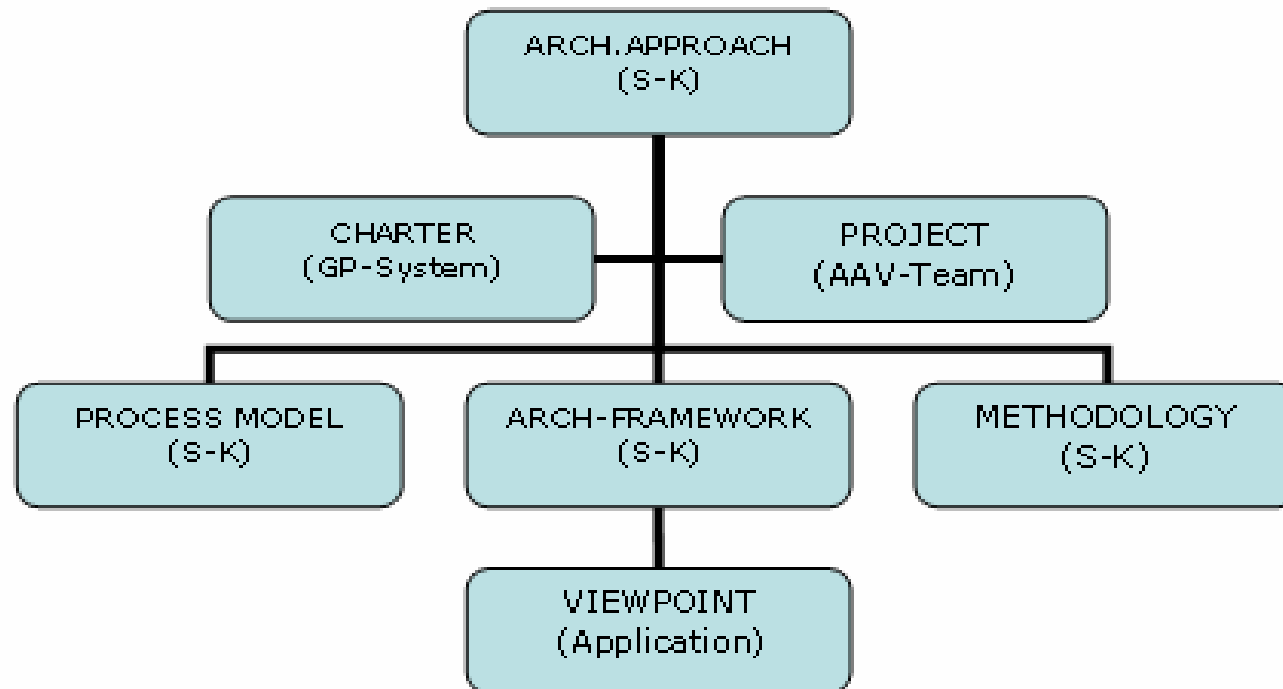
Project Charter

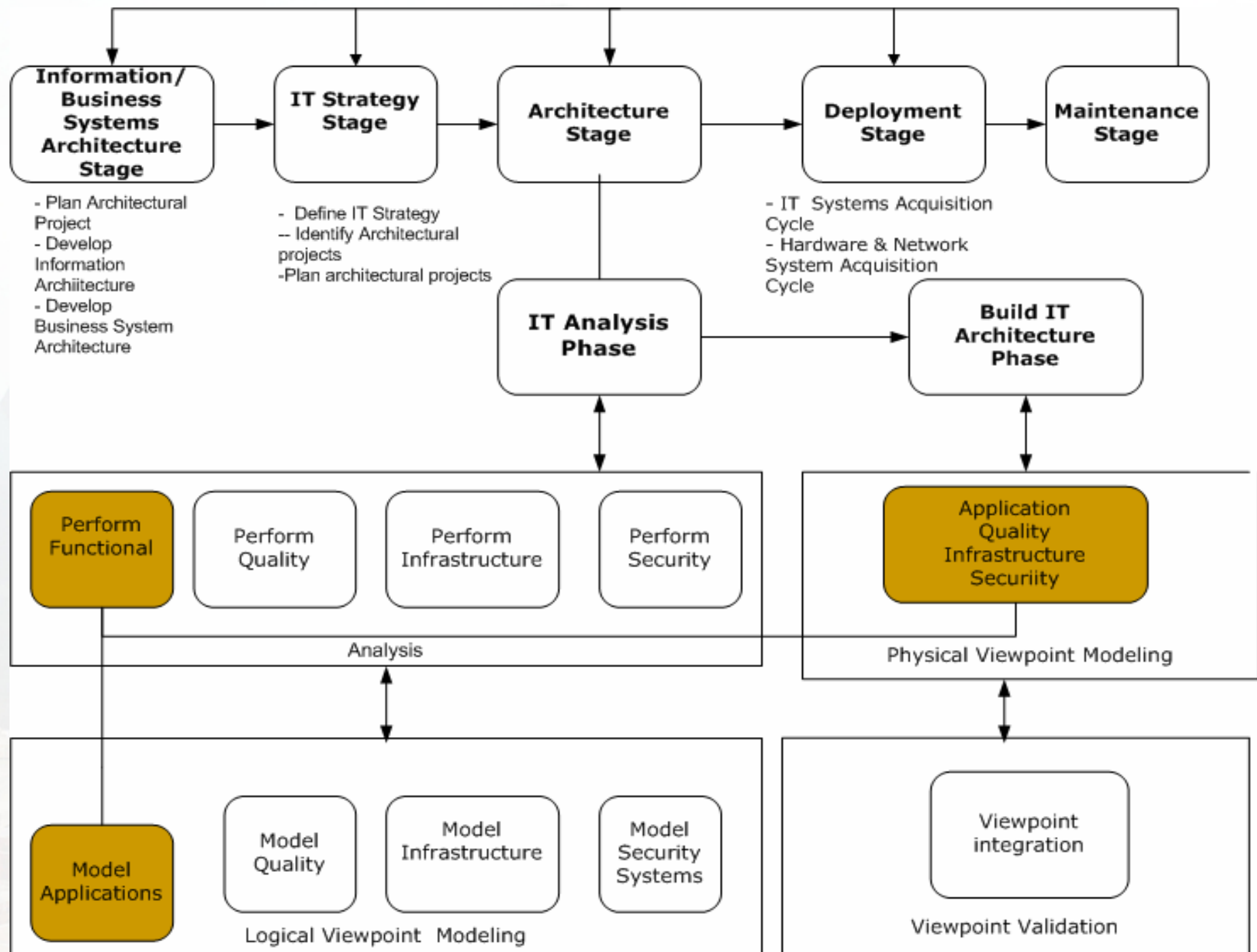
- The project scope includes analyzing
 - Automotive manufacturing environment
 - Global Purchasing applications
 - User base
 - Infrastructure supporting the legacy purchasing system
 - All other constraints imposed by corporate IT strategies and policies
- AAV Team is tasked to develop the Architecture Design Description (ADD) which includes
 - Baseline application architecture, supporting views, and new architectural models that will achieve the desired outcomes and concerns specified in the project requirements.

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S-K Architecture Approach





S-K Architectural Framework

Stakeholder	Purpose	Concern/ Principle	Content	Layer	Aspect	Viewpoint Language	Model Portfolio	Standard	Tools
Strategist (CFO)	Deciding	Business Principles	Overview	Business	Structure		Enterprise Strategic Plan System Block Diagram	COBIT	MS Visio
Global CIO Purchasing	Informing	Business/ Strategy	Coherence- Scope	Business, Technology	Structure		IT Strategic Plan System Block Diagram	COBIT	MS Visio
Project Manager	Deciding	Timeliness Efficiency	Details	Application, Technology	Structure Behavior Information		Figure 3: S-K Arch. Process Model, Figure 4: 4+1 RUP	IEEE 12207 IEEE 1058, Pmbok, IBM RUP	MS Visio MS Project
Analysts/Tester	Designing	Accessibility to contract data	Details	Application, Technology	Information	Unified Modeling Language	Figure 5: Business use case model for GPS. Function table	OMG UML 2.0	MagicDraw MS Word
Programmers	Designing	Desired functionality Reduced complexity	Details	Application	Information	Unified Modeling Language	Figure 7: Implementation model (architecture layers) Figure 8: Package diagram, Figure 9 : Class diagram	OMG UML 2.0	MS Visio MagicDraw
System Integrator	Designing	Dependency on other projects	Details	Application	Structure Information	Unified Modeling Language	Figure: Business Process for GPS Figure 6 : Sequence diagram for GPS Figure 7: Implementation model	OMG UML 2.0	MS Visio MagicDraw
System Engineering	Designing	Enhanced functionality Main- tainability	Details	Application, Technology	Structure Information	Unified Modeling Language	Figure 10: Deployment diagram	OMG UML 2.0	
End User	Informing	Ease of use	Details	Application	Information	User Training guide	Figure 5: Use case model		
Procurement	Deciding	Strategy	Details	Business	Structure Information		System Block Diagram	COBIT	MS Visio

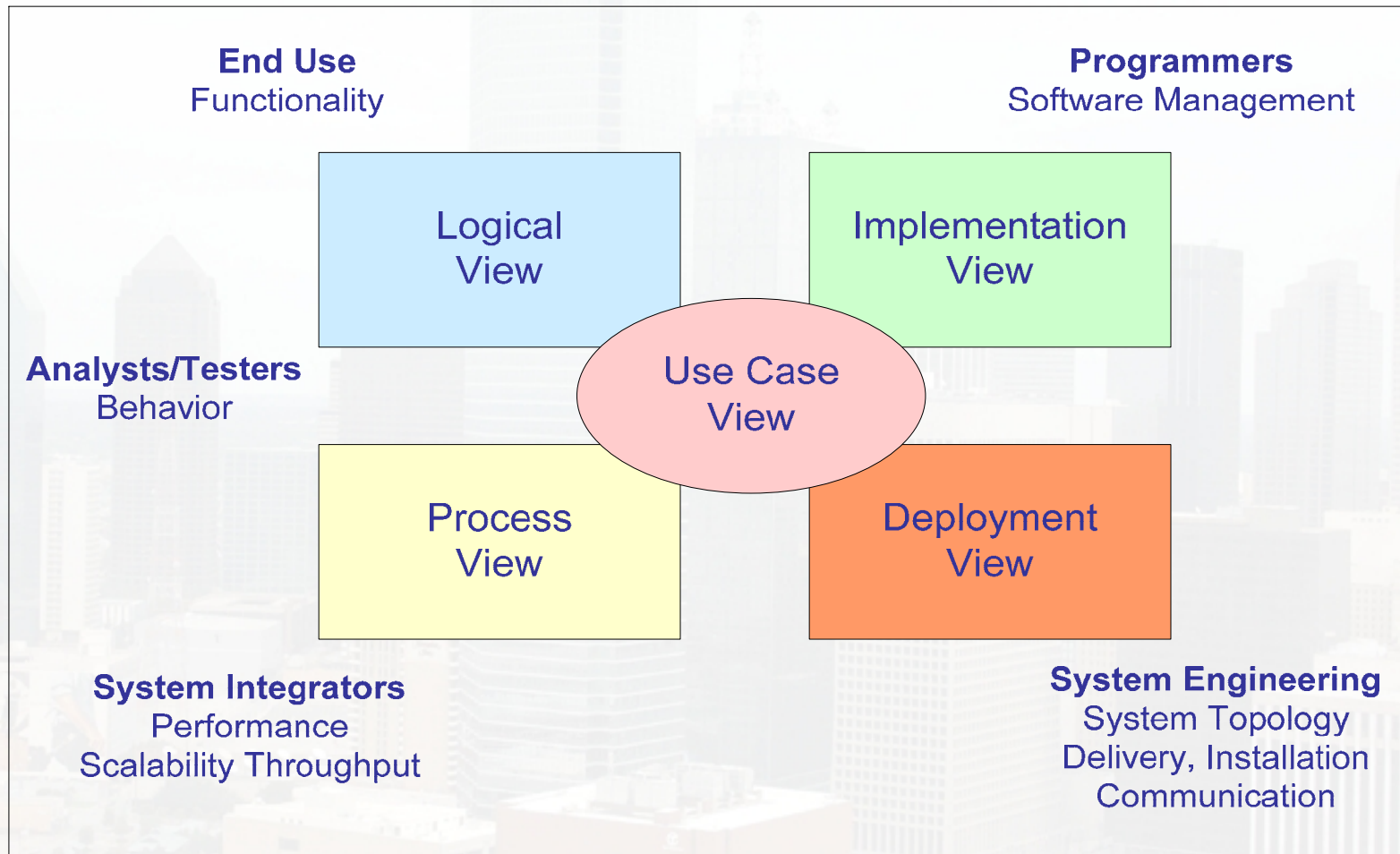
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4+1 RUP views

- Logical: the functionality as seen by the end user
- Implementation: the system as seen by the programmers
- Process: view seen by system integrators
- Deployment: view seen by system engineering to be used for installation and delivery
- Use-Case: the high level use-cases that drive the architecture

RUP 4+1 Views

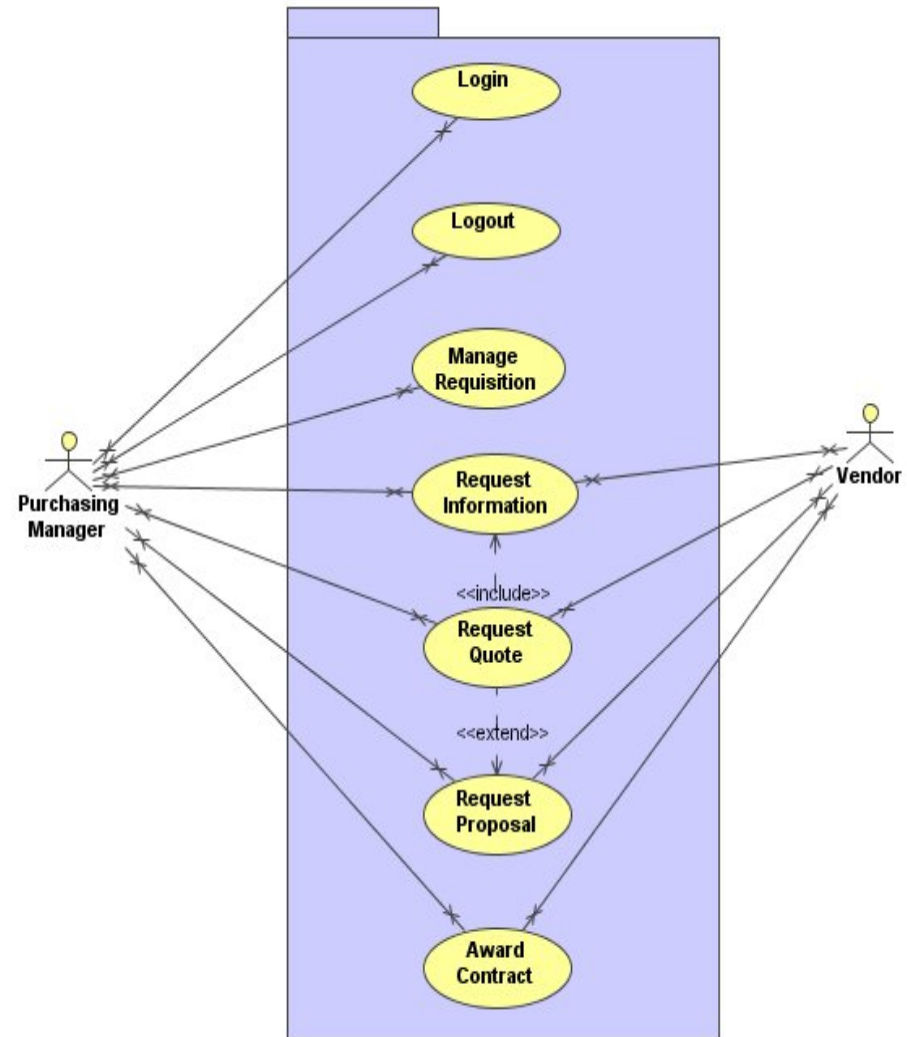


Logical View

Function #	Function	Function Description
F01.01000	Login	All users need to sign on to use the GPS system.
F01.02000	Logout	When finished with the purchasing business process, user clicks "logout" to sign out.
F01.03000	Requirement Cycle	Follow corporate statement of work and cost estimates processes and maintain relevant data
F01.04000	Requisition Cycle	Access module to perform following functions: <ul style="list-style-type: none"> • Evaluate specifications • Confirm sources • Review past performance of sources • Produce solicitation package (bid documents, qualified vendor, proposal evaluation)
F01.05000	Solicitation Cycle	Access module to support solicitation process and create: <ul style="list-style-type: none"> • Request for Quote • Request for Information • Request for Proposal
F01.06000	Award Cycle	<ul style="list-style-type: none"> • Support processes to award contract and store digital contract information
F01.07000	Global Contract Administration	Access global contract function module

Use-case View

- Captures business requirements of the system at a high level.
- Depicts the collaboration between the external actors (the purchasing manager and vendor) and the individual use cases that comprise the system.

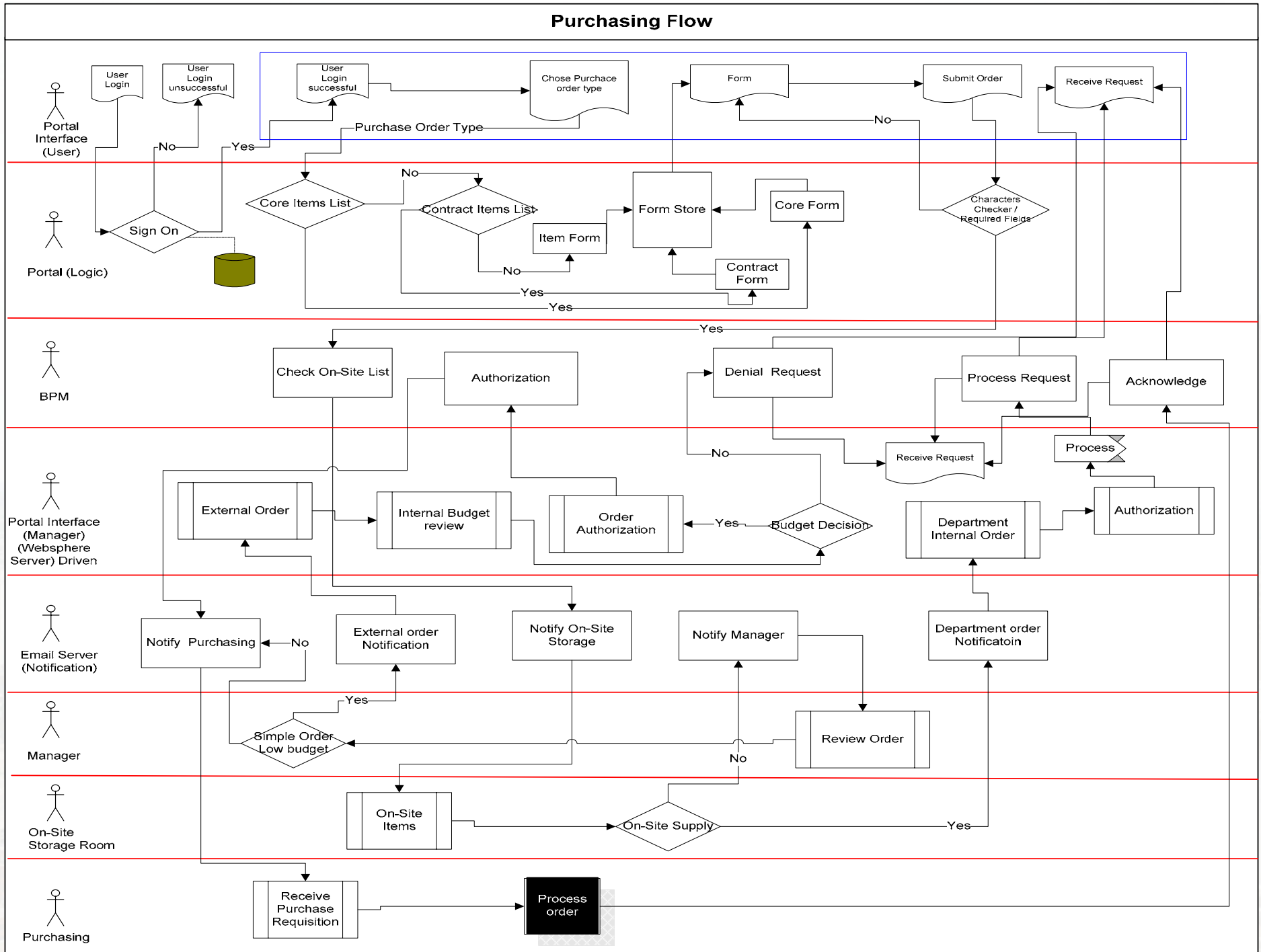


Process View

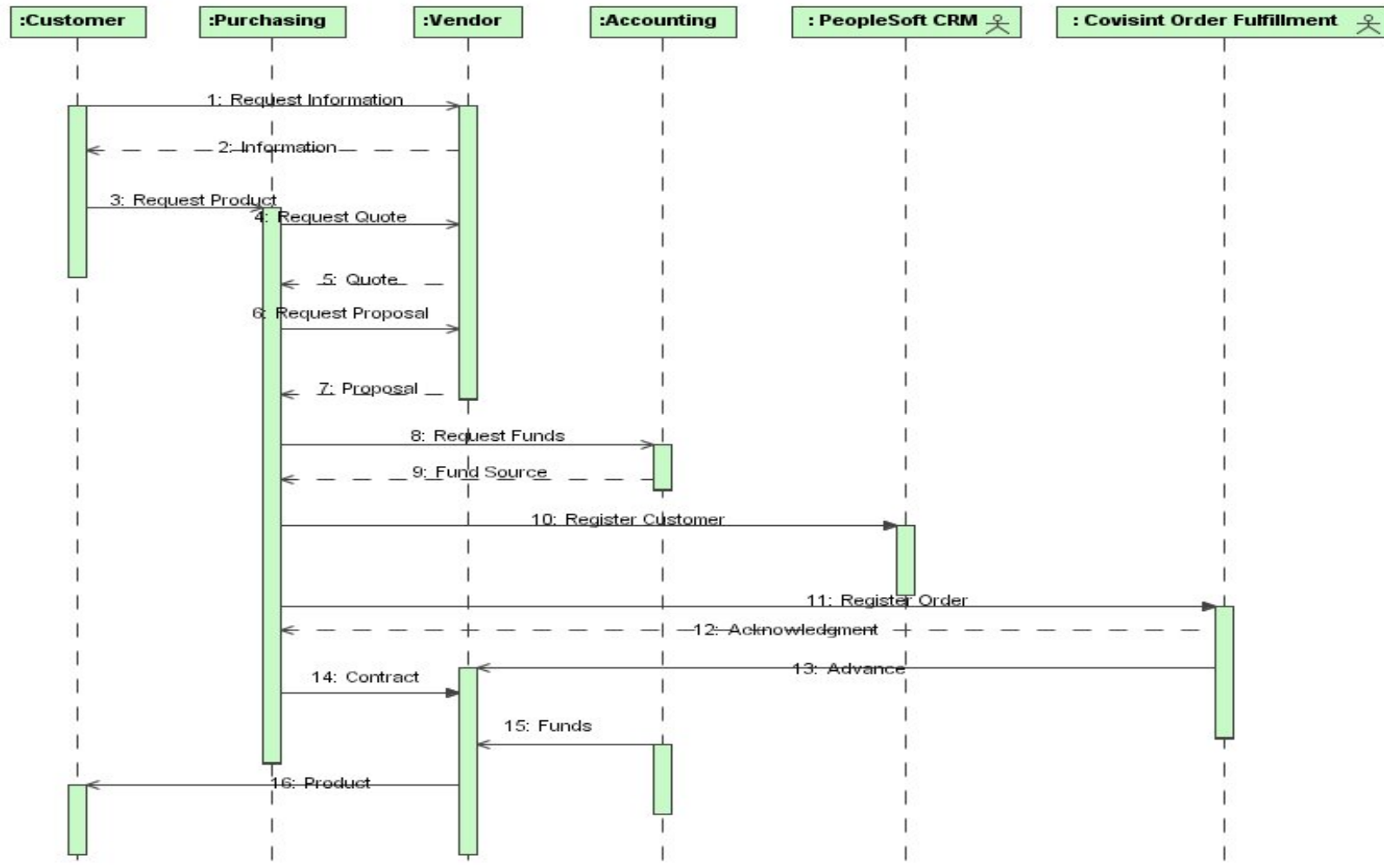
A process view for the application is captured externally and internally.

- The external part is the workflow configuration for purchase requisitions process of the purchasing process.
- The internal part is the application object process and messaging represented by a sequence diagram.

Purchasing Flow



Process View - Sequence diagram



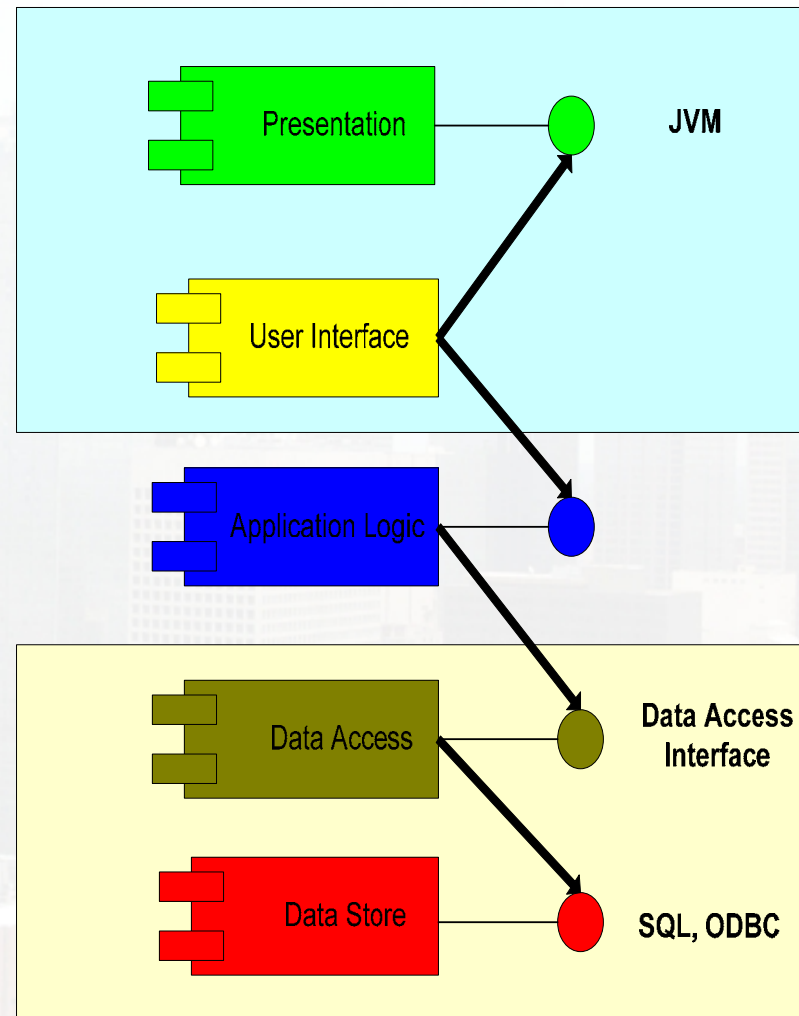
Implementation View

Describes the organization of static software modules in the development environment in terms of:

- Layering
- Packaging
- Structural building blocks of the system objects

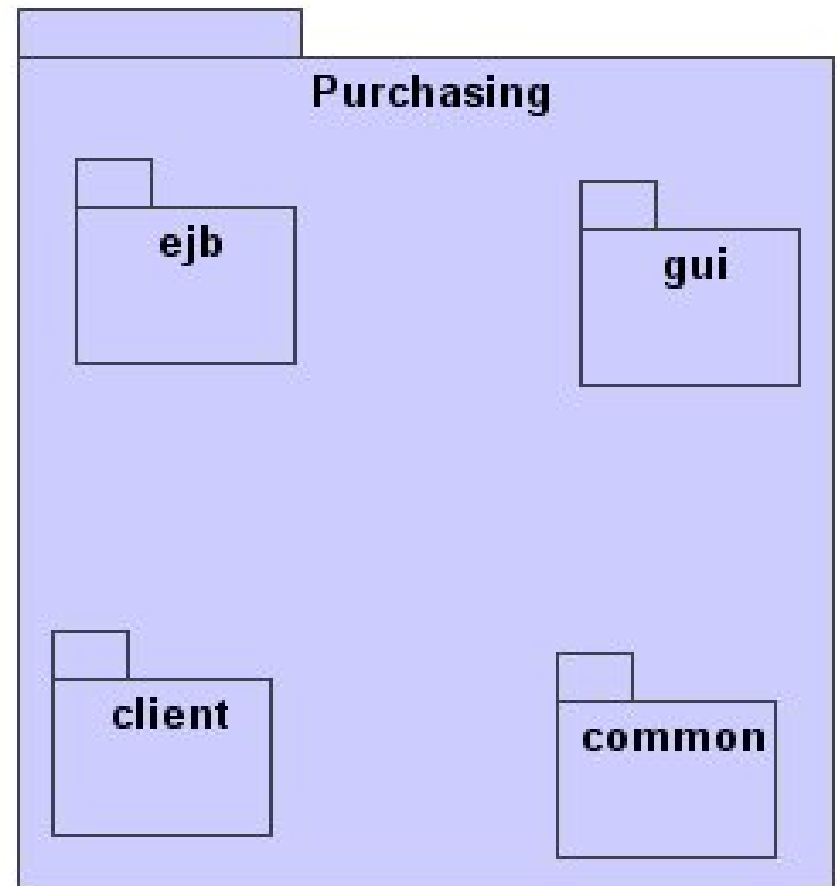
Architecture Layers

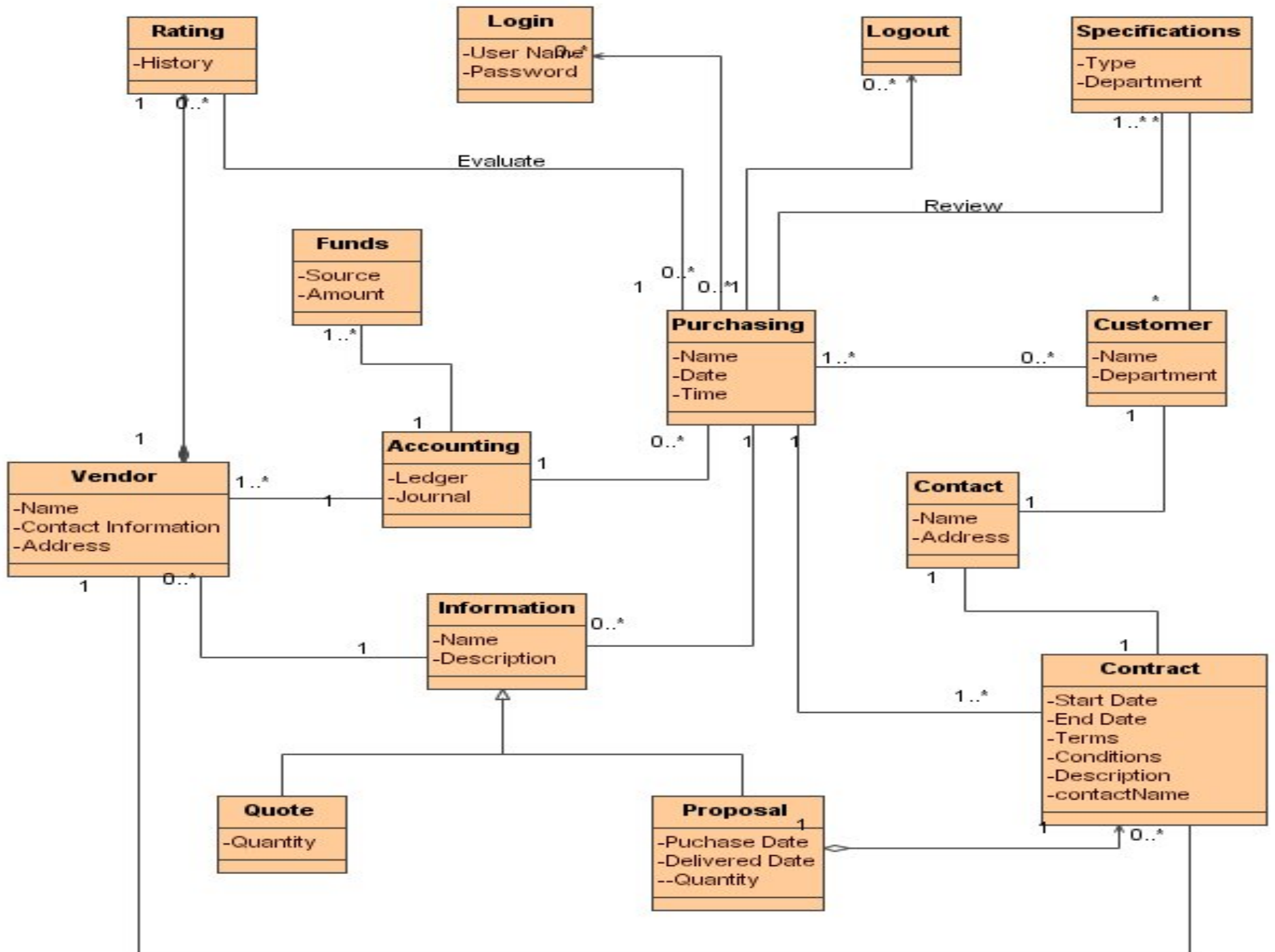
- Separating the application into layers to capture business logic in the application layer.
- Each of these layers is meant to be an independent entity that does not include any repetitions; all system functionality is encapsulated in layers.



Package Diagram

- Packages help in organizing applications as well as model elements into groups, making the implementation
 - Simpler
 - Easier
 - More organized





Deployment View



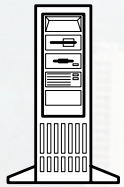
LDAP Server(s)

LDAP Servers
-Windows 2003 Server
-2 CPUs
-4 GB memory
-RAID , 4x250GB HD



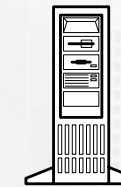
Interwoven Server(s)

Interwoven Servers
-Windows 2003 Server
-4 CPUs
-16 GB memory
-RAID 0 or 1, 4x1TB HD



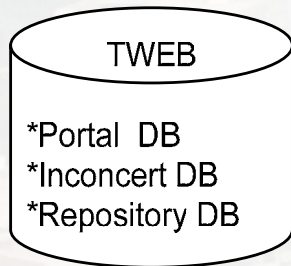
Websphere/Portal Server(s)

Portal Servers
-Windows 2003 Server
-2 CPUs
-8 GB memory
-RAID , 4x250GB HD



BPM Server(s)

BPM
-Windows 2003 Server
-2 CPUs
-4 GB memory
-RAID 5, 4x500GB HD



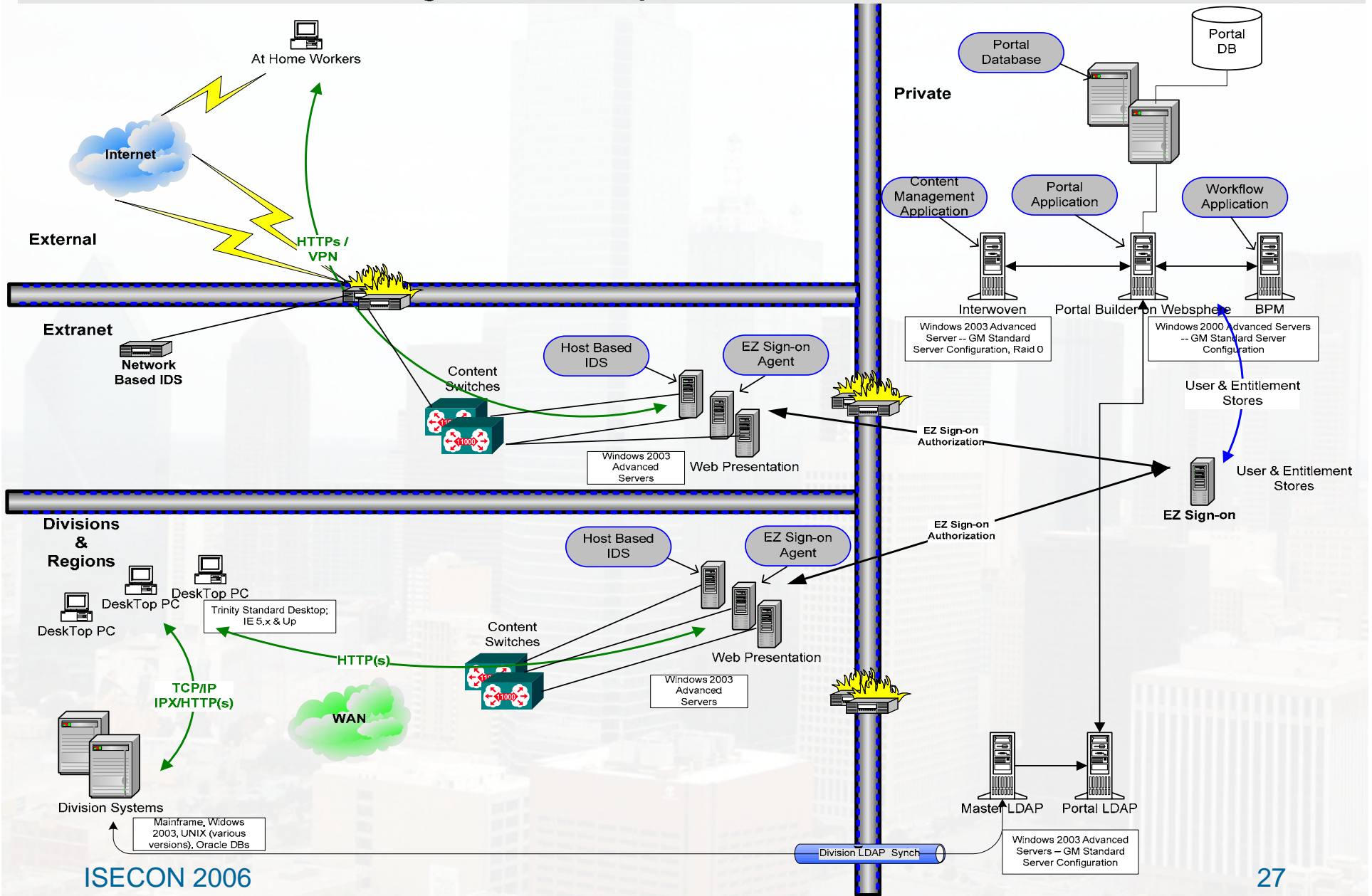
LDAP: Lightweight Directory Access Protocol

Websphere: IBM Application Server

BPM: Workflow capabilities, receiving, routing and reporting

Interwoven: Enterprise Content Management solution

Purchasing Portal Conceptual Infrastructure Architecture



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Conclusion



- Case study describes the AAV Team project experience to develop the ADD from the application viewpoint for a real-world initiative in the Heavy Vehicle Division of a global automotive manufacturer.
- Shown the models of the application views of the technical architecture; used the GPS as the application.
- Instantiation of the S-K Architectural Framework for the application viewpoint.
- Architectural models for the application viewpoint were developed using the 4+1 Rational Unified Process (RUP) architectural views.

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Thank you!

Questions???

