SoftZone

Bingo
Software Architecture Document

Version 1.0

Revision History

Date	Version	Description	Author
25/Jul/14	1.0	Software Architecture Document of the Bingo Application	H.S.R. Dharmasena

Table of Contents

Software Architecture Document

1. Introduction

1.1 Purpose

This document provides a comprehensive architectural overview of the Bingo Application, using a number of different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions which have been made on the system.

1.2 Scope

The architecture of the Bingo Application is described by the scope of this Software Architecture Document.

1.3 Definitions, Acronyms, and Abbreviations

RUP: Rational Unified Process

UML: Unified Modeling Language

SAF: Software Architecture Document

1.4 References

Rational Unified Process: http://en.wikipedia.org/wiki/Rational_Unified_Process

Unified Modeling Language: http://en.wikipedia.org/wiki/Unified_Modeling_Language

4+1 architecture: http://en.wikipedia.org/wiki/4%2B1_architectural_view_model

1.5 Overview

Section 1: Architectural Representation

Section 2: Architectural Goals and Constraints

Section 3: Use Case View

Section 4: Logical View

Section 5: Process View

Section 6: Deployment View

Section 7: Implementation View

2. Architectural Representation

- **Logical view**

  Actor: Designers.
  Area: Functional Requirements: describes the design's object model. Also describes the most important use-case realizations.
  Related tools: Design model

- **Process view**

  Actor: Developers
  Area: Non-functional requirements: describes the design's concurrency and synchronization aspects.

- **Implementation view**

  Actor: Programmers.
  Area: Software components: describes the layers and subsystems of the application.
  Related tools: Implementation model, components

- **Deployment view**

  Actor: Deployment managers.
  Area: Topology: describes the mapping of the software onto the hardware and shows the system's distributed aspects.

- **Use Case view**

  Actor: all the stakeholders of the system, including the end-users.
  Area: describes the set of scenarios, use cases that represent some significant, central functionality of the system.
  Related tools: Use-Case Model

3. Architectural Goals and Constraints

Security

The System should have proper security

The Application should have basic security behaviors:

Authentication: User should logging using user name and the password

Confidential: Sensitive data should be encrypted (Current location of the user should not be revealed by other users)

- Non repudiation: should give evidence that an action occurred
- Persistence

  Data should be persistence in Database

Usability

- Required training time

Training time for a normal user about 2 hrs and training time for a power user about 20 minutes

- Help Information

  Application should give help information to the user so the it can be handle easily

- Error Messages

  Application should give error messages and how to recover from error when error occurs

Reliability / Availability

Server which website is hosted should be available at least 98% since users need to register via the site.

Mean Time between failures

Mean time between failures should more than 5 months

Mean time to repair

Mean time to repair should be less than 1 day

Accuracy

User should get accurate information about nearby locations and accurate deals from those sites. Accuracy should be more than 95%

Resource utilization

Application should be consume less battery power. Resource utilization should be maximum

Design Constraints

- Android

Platform of the application is Android

- Java

Application uses Java as the default programming language

- Google Map API

Location identification is done using Google Map API

- Eclipse

Eclipse is used as IDE

4. Use-Case View

- Register for an account from the website

  User can sign up for an account from the website. User need to enter username, password and mobile phone number

- Login to the account

  User can login to their account using username and password

- Select whatever user wants to receive from the site

  There are several types of deals or coupons available such as Hotels, Super markets and Cafes. So the user can select what kind of deals he/she wants from the website.

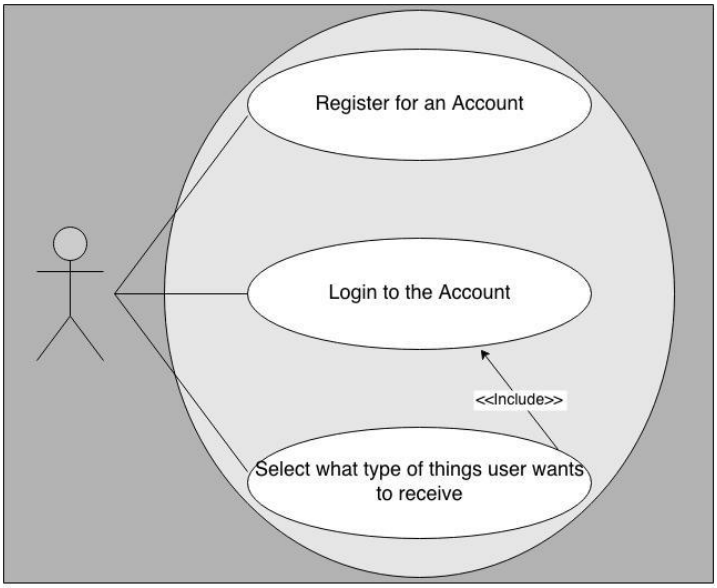
- Receive deals

  User can receive deals from nearby locations by clicking send deals button in the Bingo application.

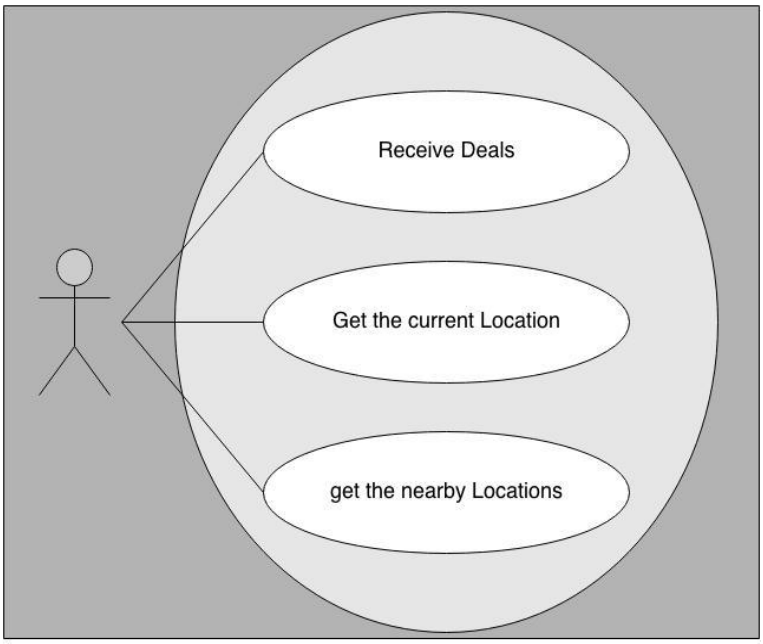
- Get the nearby locations

  User can get the information about nearby locations such as distance, reviews, address, and mobile number from the Bingo application.

Website



Application



4.1 Use-Case Realizations

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Use Case	**Register for and account**	
Description	When user visits to the website, website asks to sign up if user hasn't an account.	
Actors	User	
Preconditions	The user must visit to the site.	
Post conditions	To be sign up successful user must enter the user name, password, password again and the mobile number	
Flow of events	**Actor**	**System**
	1. User visits to the website	1.1 show sign up button
	2. User register for an account	2.1 show sign up window
Exception conditions	If the sign up information wrong, website should give a massage saying what was the wrong	

Use Case	Login to Website	
Description	When a user login to the website, website asks to enter student user name and the password.	
Actors	User	
Preconditions	The user must be registered in website.	
Post conditions	To be login successful user must enter the user name and password correctly.	
Flow of events	**Actor**	**System**
	1 User visits to the website	1.1 show login window
	2 User login to the website	2.1 authenticate user
Exception conditions	If the user name or the password wrong, website should give a massage saying login is incorrect.	

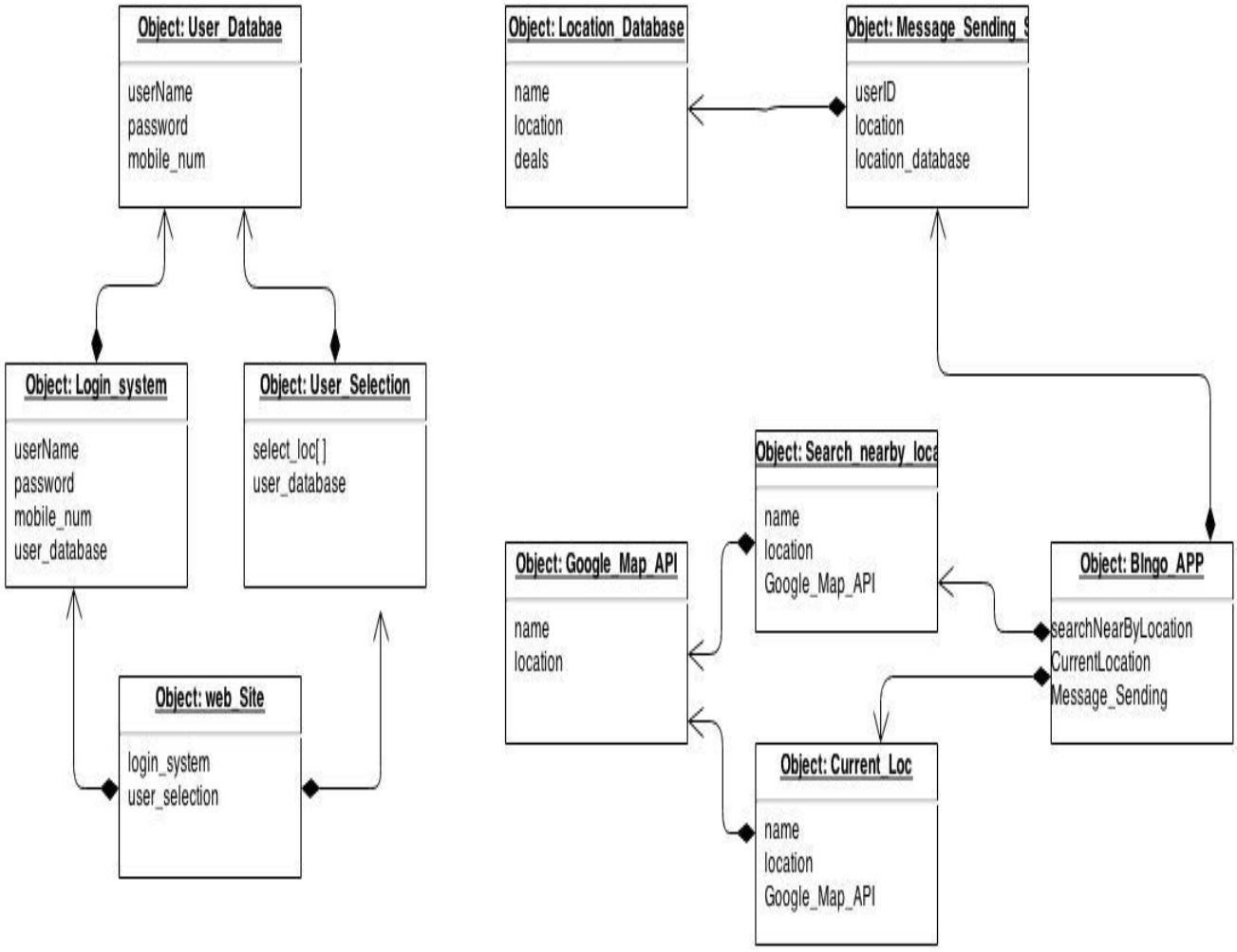
Use Case	Select what type of deals user wants to receive	
Description	After user login to the website, website asks what type of deals user wants to get. (Hotel deals, restaurant deals, super market deals)	
Actors	User	
Preconditions	The user must login to the site.	
Post conditions	By default all the options are available	
Flow of events	**Actor**	**System**
	1 User login to the website	1.1 show selection window
	2 Select what kind of deals wants	2.1 show selection window
Exception conditions	User should select at least one type, otherwise website should give a error massage	

Use Case	Receive Deals	
Description	Application should received deals from the nearby locations when user clicks receive deals button	
Actors	User	
Preconditions	The user must run Bingo Android application	
Post conditions		
Flow of events	**Actor**	**System**
	1 Run the Bingo application	1.1 show 'send deals' button
	2 click 'send deals' button	2.1 send deals from nearby locations
Exception conditions		

Use Case	**Show the current location**	
Description	Application should the current location using GPS or IP	
Actors	User	
Preconditions	The user must run Bingo Android application	
Post conditions		
Flow of events	**Actor**	**System**
	1 Run the Bingo application	1.1 show 'current location' button
	2 click 'current location button	2.1 show the current location
Exception conditions		

Use Case	**Get nearby locations**	
Description	Application should show nearby locations of the user	
Actors	User	
Preconditions	The user must run Bingo Android application	
Post conditions		
Flow of events	**Actor**	**System**
	1 Run the Bingo application	1.1 show nearby locaitons
Exception conditions		

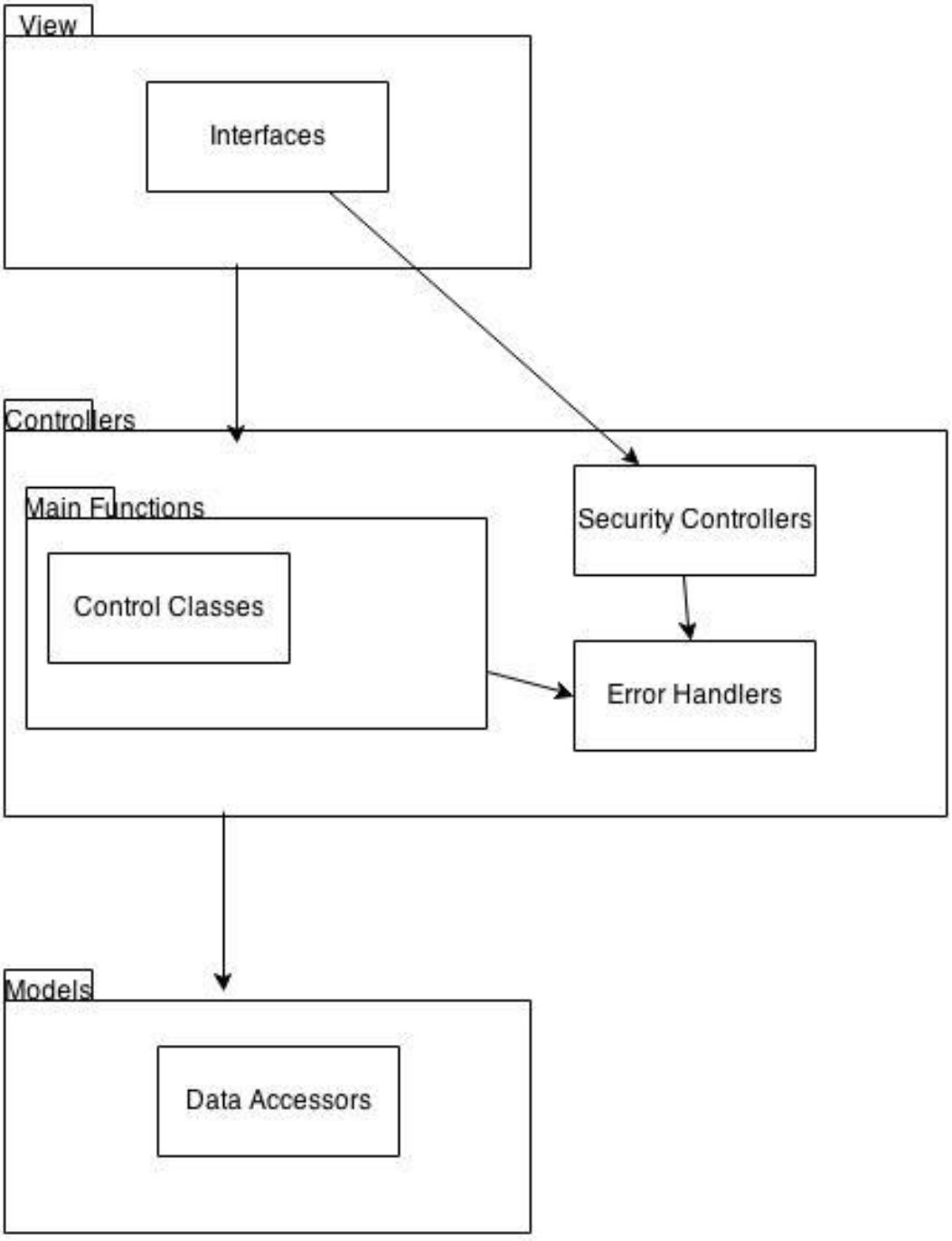
5. Logical View



5.1 Overview

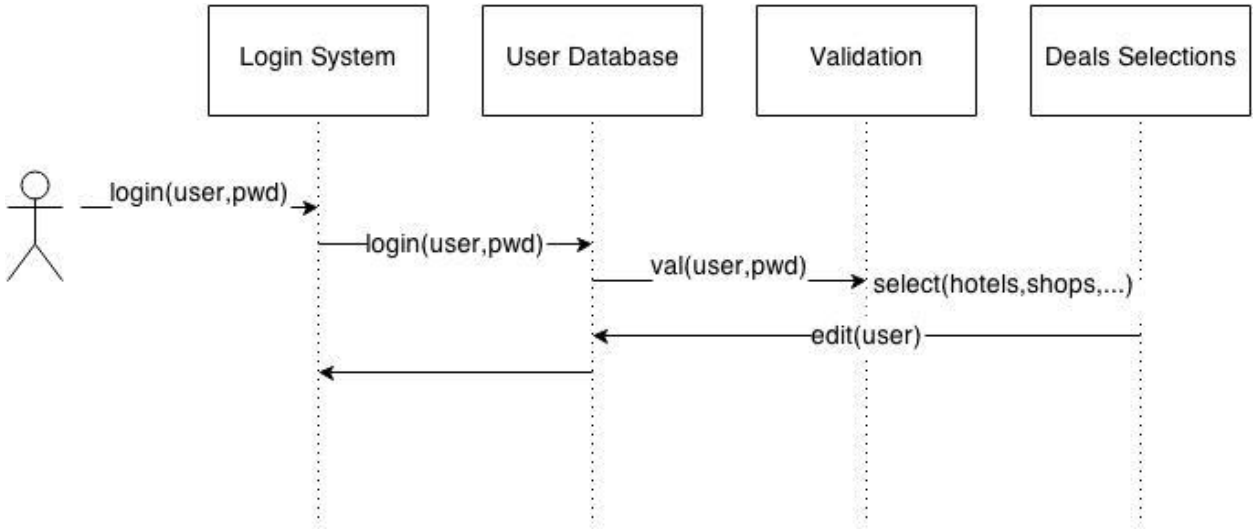
The system is decided to implement using MVC architecture. The package diagram for the applicatoin is shown below

5.2 Architecturally Significant Design Packages

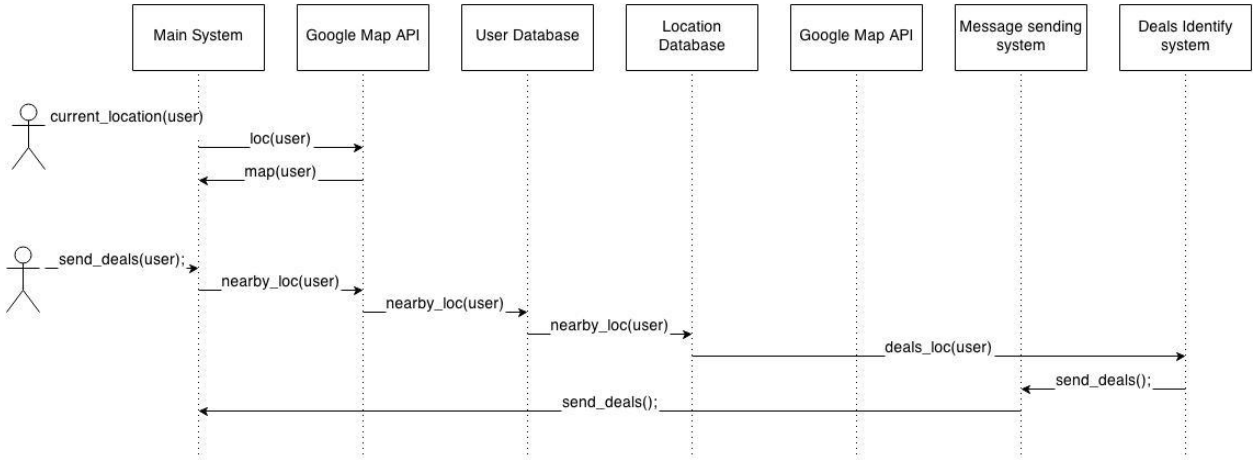


6. Process View

Process of Login System

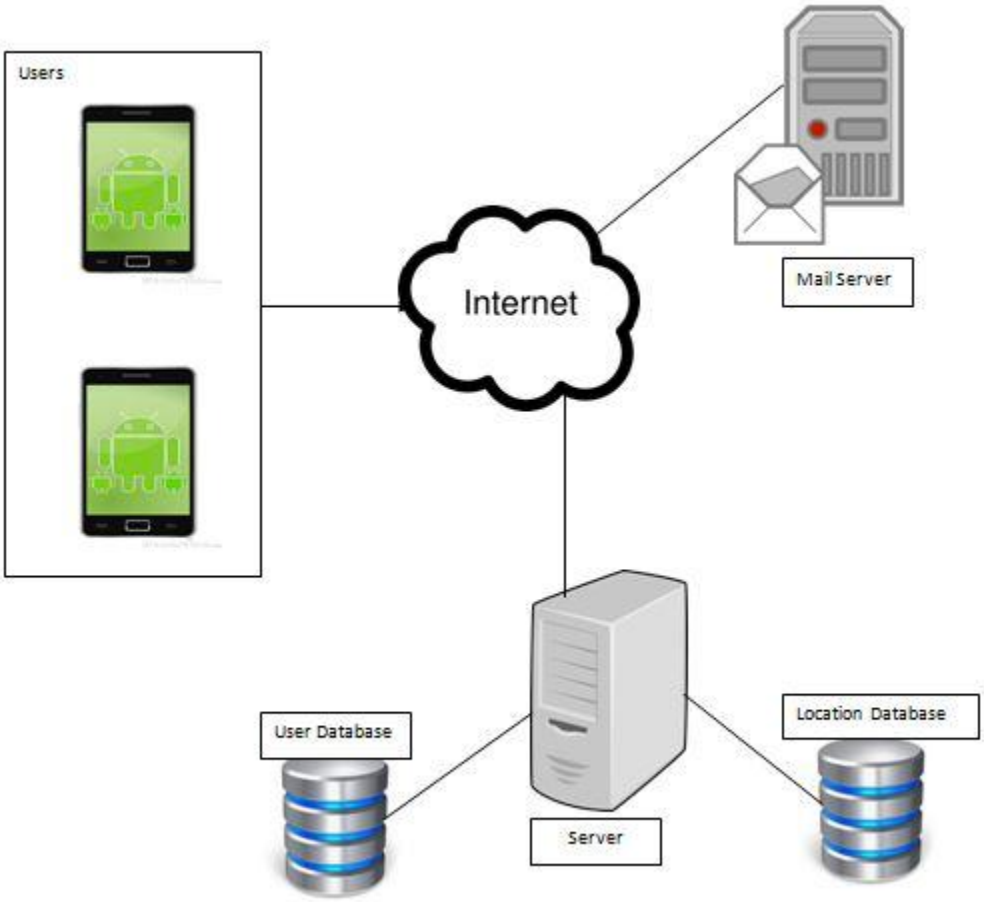


Process of Bingo Application



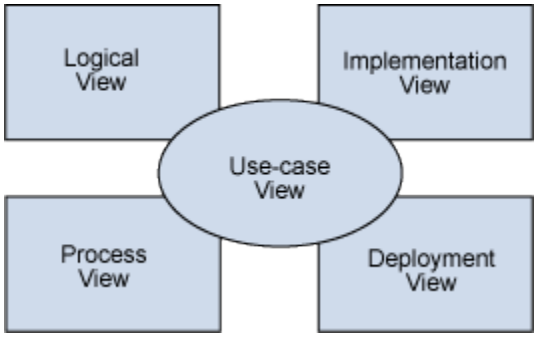
7. Deployment View

Deployment View of the Bingo Application



8. Implementation View

4+1 architecture



8.1 Overview

Define the various layers and their contents, the rules that govern the inclusion to a given layer, and the boundaries between layers. Include a component diagram that shows the relations between layers.

8.2 Layers

Each layer has specific responsibilities.

- The **presentation layer** deals with the presentation view of the app.
- The **control layer** manages the access to the domain layer
- The **resource layer** (integration layer) is responsible for the access to the enterprise information.
- The **domain layer** is related to the business logic and manages the accesses to the resource layer.
- The **Common Elements layer** gathers the common objects reused through all the layers

9. Size and Performance

Performance

- Response time in website

  Response time in website should be less than 1 second. User should be able to register, login and select types from site as quickly as possible

- Response time in Bingo application

  Response time in Bingo application should be less than 5 seconds. Deals should be sent to the application within 5 seconds

- Concurrent Access

  At least 100 users can be able to concurrently access to the website

10. Quality

Several quality aspects were considered

- Extensibility
- Reliability
- Portability
- Security