Identify Design Elements Solution

for

Book Rental and Sales System

Version 1.3 approved

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November 30, 2023

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Revision History

Name	Date	Reason For Changes	Version
Trinh Thai Linh	30-Nov-23	Create Document Template	1.0
Trinh Thai Linh	01-Dec-23	Add *Introduction, Analysis Class to Design Element Map*	1.1
Trinh Thai Linh	04-Dec-23	Add changes to *Analysis Class to Design Element Map, Design Element to Owning Package Map*	1.2
Nguyen Hoang Anh Dung	04-Dec-23	Add *BankSystem and SMSSystem Subsystem Context.*	1.3
Pham Tung Duong	04-Dec-23	Add *ForumSystem and OrderSystem Subsystem Context.*	1.3
Trinh Thai Linh	04-Dec-23	Add *BookSystem and RentalSystem Subsystem Context.*	1.3
Trinh Thai Linh	04-Dec-23	Add *Architectural Layers and Their Dependencies*	1.3
Trinh Thai Linh	04-Dec-23	Finalizes changes.	1.3

1. Introduction

1.1 Purpose

This is a report prepared by Group 7 (Object-oriented Analysis and Design Class 20, 22-23) of Use Case Solution Analysis for Book Rental and Sales System and is written based on the reporting format "IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications".

The purpose of this report is to present the system properties, their structure and behaviour with the system's architecture model.

1.2 Intended Audience and Reading Suggestions

The different types of reader that the document is intended for are:

- **Designers:** Design the classes and the subsystems architecture that satisfies the requirements specified in this SRS.
- **Developers:** Implement codes from the design and these documents. They use this document as a blueprint, and it makes sure that, firstly, their code works properly, and secondly, it is in sync with others' codes.
- **Tester:** Use this document to understand the requirements. They have to create a test plan that outlines the scope of testing, testing objectives, test environment setup, resources required, and a schedule.
- **Documentation writers:** Ensure that the documentation aligns with the software's requirements as specified in the Software Requirements Specification (SRS). Verify that the documented information is accurate and complete.

1.3 Product Scope

The software, “Book Rental and Sales System”, is designed to provide a platform for users to rent, purchase, read books in both physical and electrical form. Additionally, it includes a forum where users can discuss with other readers about the books they purchased, rented or simply ones that captured their interest. The system aims to enhance the reading experience and promote the reading community engagements.

1.4 References

[1] Form of presentation IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.

[2] System Requirements Specification Content and Format Standard, which specifies the content and format of this specification.

[3] Previous Project of Object-Oriented Analysis and Design Course, The Cargo Carriage System.

2. Subsystem Context Diagrams

2.1 BookSystem Subsystem

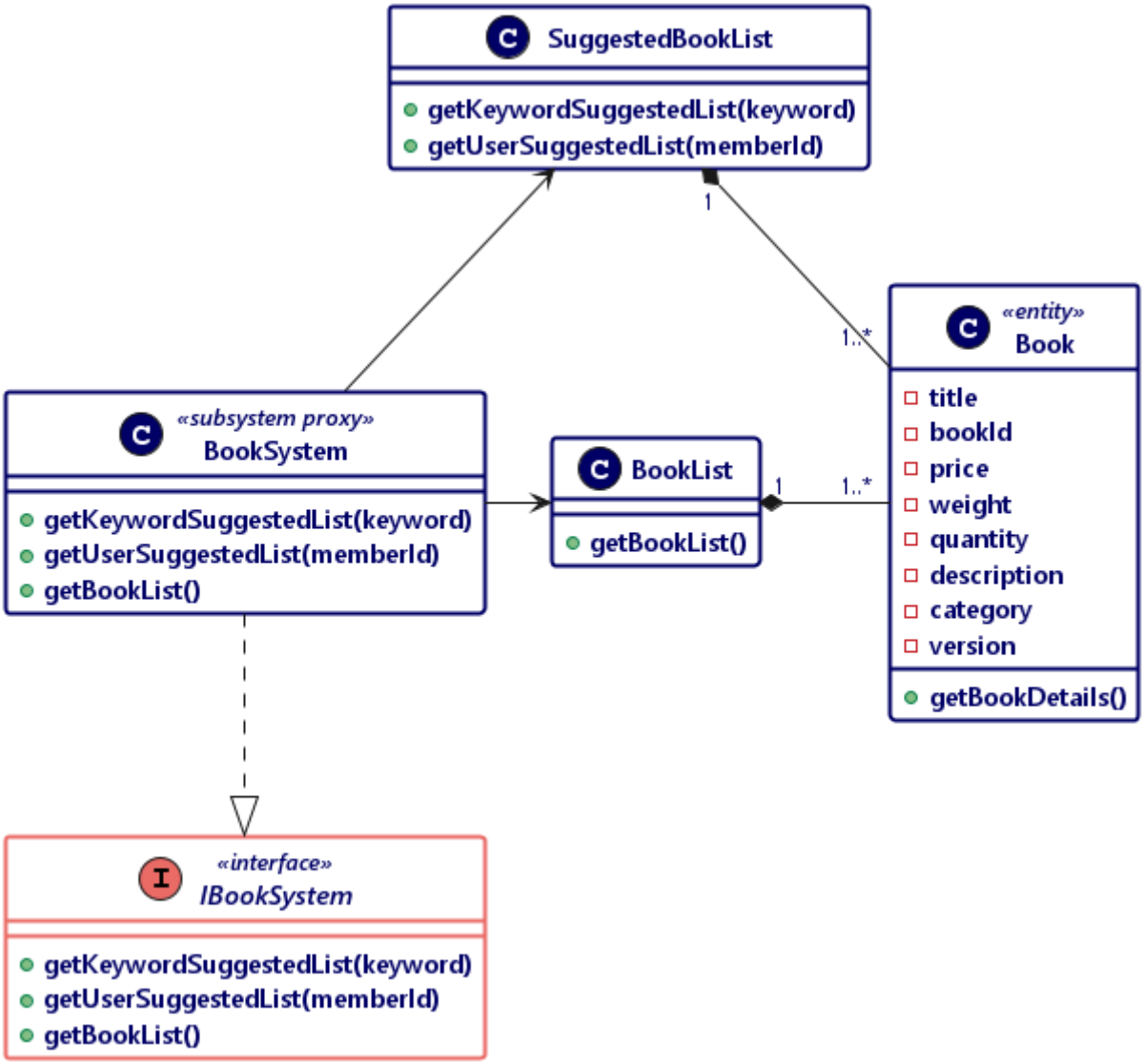

Figure 2-1: BookSystem Subsystem Diagram.

2.1.1 Subsystem Interface Descriptions

- **BookSystem:** Encapsulates behaviours to support Books related applications.
- **IBookSystem:** Encapsulates communication with other design elements.

2.2 OrderSystem Subsystem

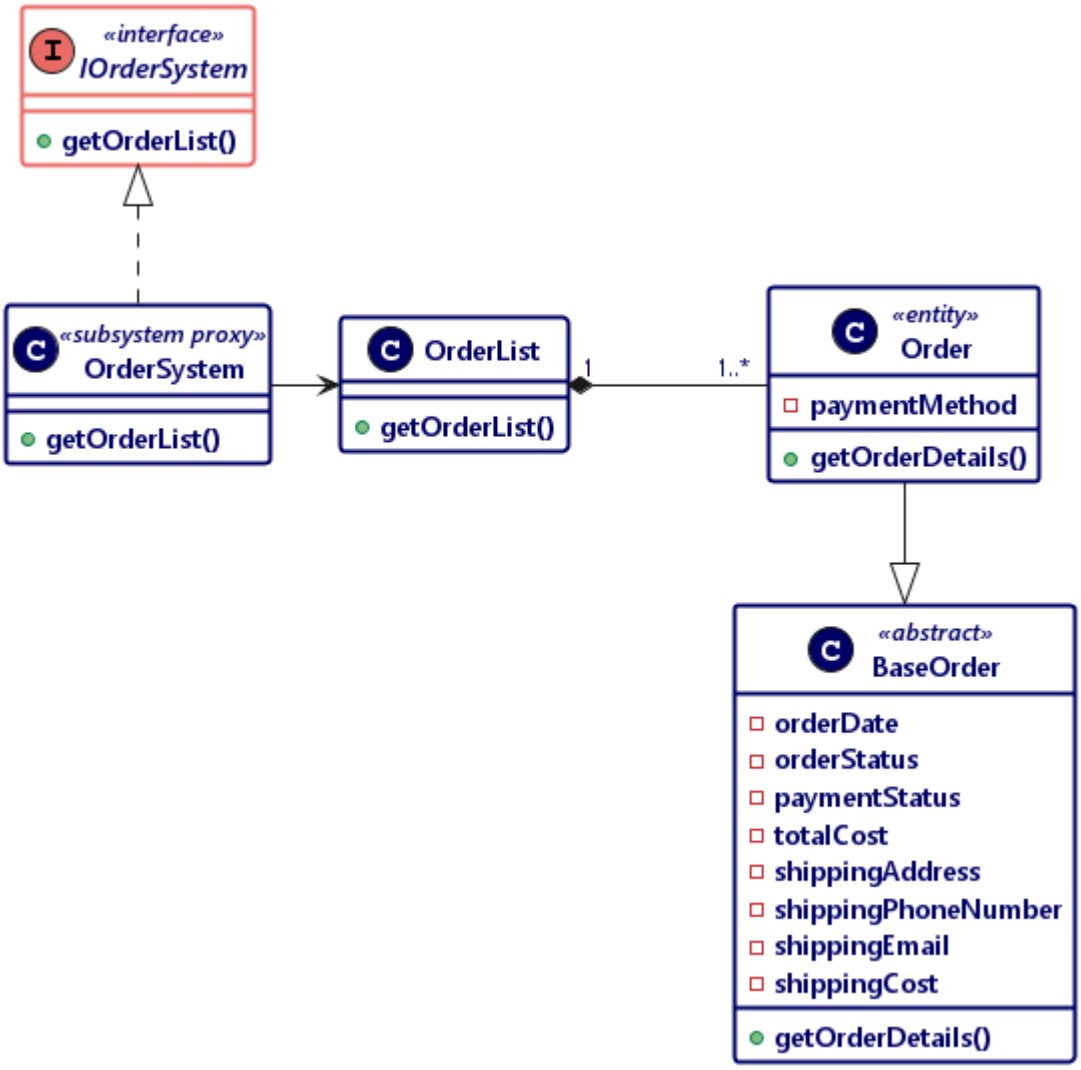

Figure 2-2: OrderSystem Subsystem Diagram.

2.2.1 Subsystem Interface Descriptions

- **OrderSystem:** Encapsulates behaviours to support Orders related applications.
- **IOrderSystem:** Encapsulates communication with other design elements.

2.3 SMSSystem Subsystem

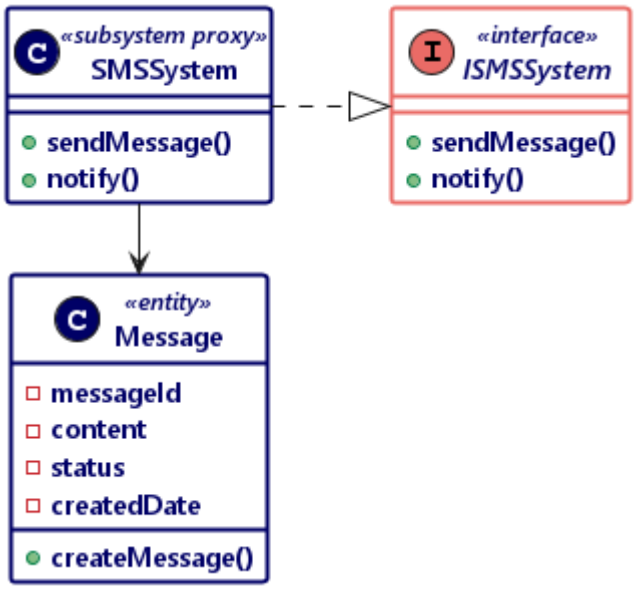

Figure 2-3: SMSSystem Subsystem Diagram.

2.3.1 Subsystem Interface Descriptions

- **SMSSystem:** Encapsulates behaviours to support Messages Service.
- **ISMSSystem:** Encapsulates communication with other design elements.

2.4 BankSystem Subsystem

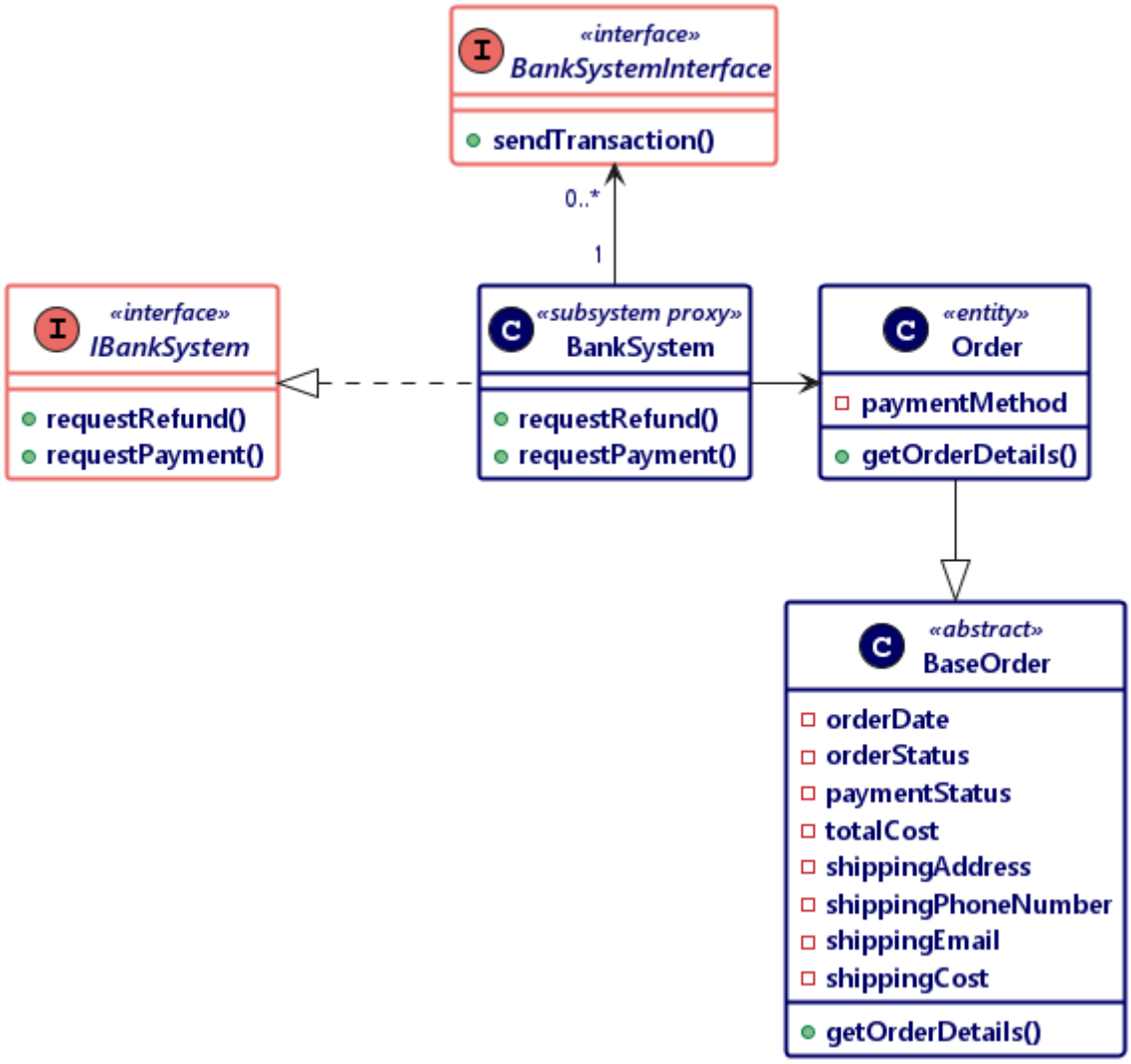

Figure 2-4: BankSystem Subsystem Diagram.

2.4.1 Subsystem Interface Descriptions

- **BankSystem:** Encapsulates behaviours to support Payment Service.
- **IBankSystem:** Encapsulates communication with other design elements.

3. Analysis Class to Design Element Map

Analysis Class	Design Elements
SignUpForm	SignUpForm
SignInForm	SignInForm
ResetPasswordForm	ResetPasswordForm
ForumServiceForm	ForumServiceForm
RequestRefundForm	RequestRefundForm
OrderServiceForm	CreateOrderForm
	PaymentForm
	CancelOrderForm
	OrderSystem subsystem
	IOrderSystem interface
ReviewServiceForm	ReviewOrderForm
EditProfileForm	EditProfileForm
ShoppingCartForm	UpdateCartForm
BookServiceForm	SearchBookForm
	ViewBookForm
	UpdateBookForm
	ReadBookForm
	BookSystem subsystem
	IBookSystem interface
RentalServiceForm	RentalServiceForm
AdminManagerForm	AdminManagerForm
UsedBookServiceForm	UsedBookForm
BankSystem	BankSystemAccess
	BankSystem subsystem

	IBankSystem interface
UsedBookServiceForm	UsedBookForm
ChatServiceForm	ChatServiceForm
	SMSSystem subsystem
	ISMSSystem interface
BookService	SearchBookController
	ViewBookDetails
	UpdateBookController
	ReadBookController
	BookSystem subsystem
	IBookSystem interface
EditProfile	EditProfile
OrderService	CreateOrderController
	CancelOrderController
	ViewOrderController
	OrderSystem subsystem
	IOrderSystem interface
ReviewService	ReviewOrderController
AuthenticationService	AuthenticationController
ForumService	ForumService
RentalService	RentalServiceController
ShoppingCart	UpdateCartController
UsedBookService	SellUsedBookController
ChatService	ChatServiceController
	SMS subsystem
	ISMS interface
MemberProfile	MemberProfile
Administrator	AdminProfile

LoyaltyCard	LoyaltyCard
Order	NewOrder
	UsedBookOrder
ShoppingCart	Cart
Review	Review
Book	Book
Post	Post
RentalPlan	RentalPlan
Publisher	Publisher
Author	Author
Message	Message

4. Design Element to Owning Package Map

Design Elements	"Owning" Package Map
SignUpForm	Application::MemberActivities
SignInForm	BusinessService::Security
ResetPasswordForm	BusinessService:::Security
ForumServiceForm	Application::MemberActivities
RequestRefundForm	Application::MemberActivities
CreateOrderForm	Application::MemberActivities
PaymentForm	Application::MemberActivities
CancelOrderForm	Application::UserActivities
ReviewOrderForm	Application::MemberActivities
EditProfileForm	Application::MemberActivities
UpdateCartForm	Application::MemberActivities
SearchBookForm	Application::AdminActivities
ViewBookForm	Application::MemberActivities
UpdateBookForm	Application::MemberActivities
ReadBookForm	Application::MemberActivities
RentalServiceForm	Application::MemberActivities
AdminManagerForm	Application::AdminActivities
UsedBookForm	Application::MemberActivities
BankSystemAccess	BusinessService::BankSystem
ChatServiceForm	Application::MemberActivities
SearchBookController	BusinessService::BookSystem
ViewBookDetails	BusinessService::BookSystem
UpdateBookController	BusinessService::BookSystem
ReadBookController	BusinessService::BookSystem

EditProfile	BusinessService::EditProfile
CreateOrderController	BusinessService::OrderSystem
CancelOrderController	BusinessService::OrderSystem
ViewOrderController	BusinessService::OrderSystem
ReviewOrderController	BusinessService::OrderSystem
AuthenticationController	BusinessService::Security
ForumService	BusinessService::ForumService
RentalServiceController	BusinessService::RentalServiceController
UpdateCartController	BusinessService::UpdateCartController
SellUsedBookController	BusinessService::OrderSystem
ChatServiceController	BusinessService::SMSSystem
MemberProfile	Business Services::Domain::Profile
Message	Business Services::Domain::Profile
AdminProfile	Business Services::Domain::Profile
LoyaltyCard	Business Services::Domain::Profile
Order	Business Services::Domain::Order
Cart	Business Services::Domain::Profile
Review	Business Services::Domain::Order
Book	Business Services::Domain::Book
Post	Business Services::Domain:Forum
RentalPlan	Business Services::Domain::Profile
Publisher	Business Services::Domain::Book
Author	Business Services::Domain::Book
OrderSystem	Business Services::OrderSystem
IOrderSystem	Business Services::ExternalSystemInterfaces
BookSystem	Business Services
IBookSystem	Business Services::ExternalSystemInterfaces
BankSystem	Business Services

IBankSystem	Business Services::ExternalSystemInterfaces
SMSSystem	Business Services
ISMSSystem	Business Services::ExternalSystemInterfaces

5. Architectural Layers and Their Dependencies

5.1 Architectural Layers

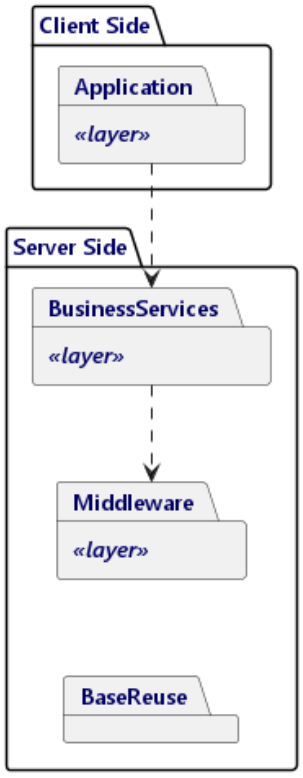

Figure 5-1: Architectural Layers.

5.2 Packages' Dependencies

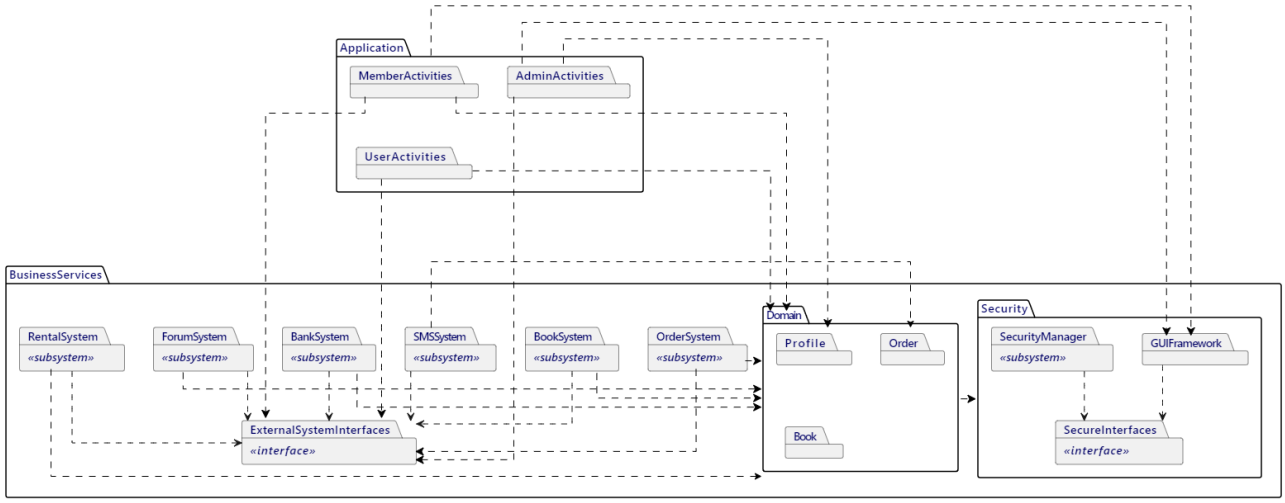

Figure 5-2: Packages and Dependencies.

5.3 Package Descriptions

- **MemberActivities:** Contains the design elements that support the Member's applications.
- **AdminActivities:** Contains the design elements that support the Admin's applications.
- **UserActivites:** Contains the design elements that support both Member and Admin's applications. (for example: Cancel Order, Edit Profile, SignIn)
- **BankSystem subsystem:** Encapsulates communication with all external bank systems.
- **SMSSystem subsystem:** Encapsulates communication with the external SMS system.
- **BookSystem subsystem:** Encapsulates behaviours to support Books related applications.
- **OrderSystem subsystem:** Encapsulates behaviours to support Orders related applications.

- **External System Interfaces:** Contains the interfaces that support access to external systems. This is so that the external system interface classes can be version controlled independently from the subsystems that realize them.
- **Base Reuse:** Basic reusable design elements.
- **Domain:** Contain the core Book Rental and Sales System's abstractions.
- **SecurityManager Subsystem:** Provides the implementation for the core security services.
- **SecureInterface:** Contains the interfaces that provide clients access to security services.

6. Appendix A: Glossary

- **Analysis class:** A class used to model interaction between the system's surroudings, control, information and associate behavior specific in system(Boundary class, control class, Entity class)
- **Architectural layer:** Layer is contructed, progressed and concerned with the logical divison of components and functionality in system.
- **Bank System:** A system supports finance management of system and stakeholders for transactions.
- **Context Diagram:** A context diagram is a data flow diagram, with only one massive central progress that subsumes everything inside the scope of the system. It shows how the system will receive and send data flows to the external entities involved.
- **Dependency:** Exists between two elements if changes to one element may cause changes to the other.
- **Design Element**: The analysis classes are refined into design model elements (design classes, packages and subsystems).
- **Interface:** An interface is a model element that defines a set of behaviors (a set of operations) offered by a classifier model element (specifically, a class, subsystem, or component).
- **Layer:** A grouping of classes, packages or subsystems that together have responsibility for one major aspect of a system.
- **Package:** A general-purpose mechanism for organizing elements into groups. They provide the ability to organize the model under development. A package is represented as a tabbed folder.
- **Persistence:** refers to the characteristic of state that outlives the process that created it. This is achieved in practice by storing the state as data in computer data storage.
- **Security:** Is the degree of resistance to, or protection for data, resources of customer from harm.

- **Subsystem:** Is used as a unit of behavior in the system, which provides the ability to completely encapsulate the interactions of a number of class and/or subsystems.