

# HANOI UNIVERSITY

**Faculty of Information Technology**

# ----------&----------

**SYSTEM ANALYSIS AND DESIGN ACTIVITIES REPORT**

**Module name: System Analysis and Design Year: Fall 2024**

**Instructor: Trịnh Bảo Ngọc**

**Topic: Carti Hotel Management System**

**Group: 11**

**Group members:**

**- Nguyễn Giang Minh (2101040121– 4C21)**

**- Phan Khánh Huyền (2101040106 - 4C21)**

**- Hoàng Sinh Hùng (2101040096 - 4C21)**

**- Trần Quang Huy (2101040103 - 4C-21)**

**- Đặng Gia Nguyên (2101040135 - 4C-21)**

**- Nguyễn Hữu Đăng (2101040048 - 4C-21)**

# Table of Contents

[**ABSTRACT** 3](#_heading=h.30j0zll)

1. [**Business Modeling** 5](#_heading=h.3znysh7)
2. [**Requirements Definition** 6](#_heading=h.tyjcwt)
3. [**Prototype** 7](#_heading=h.1t3h5sf)
4. [**Analysis & Design** 8](#_heading=h.2s8eyo1)
5. [**Conclusion** 11](#_heading=h.3rdcrjn)

# ABSTRACT

*In the contemporary business landscape, the reliance on computer systems has become indispensable for organizational management, particularly in sectors such as tourism where the demand for efficient hotel management solutions is on the rise. The Carti Hotel Management System emerges as a tailored solution to meet the administrative needs of establishments, aiming to enhance overall efficiency. Aligned with the Rational Unified Process (RUP), our project focuses on capturing the business context, specifying requirements, and providing an architectural design solution. The system is meticulously designed to fulfill both functional and non-functional requirements, with the output encompassing comprehensive documentation across Business Modeling, Requirements Definition, and Analysis & Design, complemented by prototypes.*

# GROUP ROLES

| **Members** | **Roles** |
| --- | --- |
| Nguyễn Giang Minh, Trần Quang Huy | Architecture Designer, Requirements  Modeller |
| Nguyễn Hữu Đăng, Đặng Gia Nguyên | Software Architect, Data Modeller, Requirements  Modeller, |
| Hoàng Sinh Hùng | Business Process Analyst |
| Phan Khánh Huyền | Business Modeller, Prototype |

Since this project is the final project of this SAD course, all members cooperate in most of the processes; especially in heavyweight processes such as Use-Case specification during Requirement Definition, and Use-Case realization during Analysis & Design.

# Business Modeling

Huyền and Hùng have taken on the roles of business modeling and business process analysis for the Carti Hotel project. In their capacity, they thoroughly examined the target organization, Carti Hotel, by delineating the workflow of one or multiple business use cases. This involved defining the responsibilities, operations, attributes, and relationships associated with various business workers and entities. Additionally, they spearheaded and coordinated business use-case modeling, strategically identifying business actors, processes, and use cases. Their efforts included outlining how these actors engage in and carry out processes within the organizational framework of the Carti Hotel.

# Requirements Definition

In the Requirements Definition phase, Minh and Huy took the lead in directing the team's efforts. Collaborating with Đăng and Nguyên, they outlined a top-level view of system use cases within the Software Requirements Specification document. Minh also played a pivotal role by distributing the use-case specifications among team members, ensuring everyone gained hands-on experience in modeling actual business processes into system use cases. Minh and Huy focused on three specific use cases: Display Revenue Report, Manage Users, and Manage Services, Đăng and Nguyên delved into specifying two use cases: Book Rooms and Manage Rooms. While Huyền and Hùng handled three specific use cases: Check-In, Check-Out, and Making Payment. This collaborative approach allowed the team to comprehensively address the various aspects of use-case modeling and requirements specification for the Carti Hotel Management System.

# Prototype

Huyền and Hùng has taken on the responsibility of implementing a functional prototype to showcase the features of the Carti Hotel Management System. The prototype is developed using the Figma application and serves as a basic working Graphical User Interface, illustrating the system functionalities outlined in the Requirements Definition phase. It is important to note that the prototype is designed solely for demonstration purposes and does not involve any server or persistent data. Furthermore, it exclusively presents the views of the system and does not encompass the complete MVC (Model-View-Controller) architecture. This approach allows for a focused display of system functionalities through a straightforward user interface without the complexities of backend operations or a comprehensive architectural framework.

# Analysis & Design

In the role of a novice software architect, Đăng and Nguyên took charge of architecture-related activities and artifacts throughout the project. Đăng and Nguyên were responsible for constructing the overall structure of each architectural view, determining the decomposition of these views, and outlining how the components are grouped within the system. The table below provides a breakdown of the activities conducted by Đăng and Nguyên to design the software architecture within the Analysis & Design workflow.

| Activity | Description | Output Artifacts |
| --- | --- | --- |
| Prioritize Use Cases | * Define input for selecting scenarios and use cases for analysis in the current iteration. * Specify scenarios and use cases representing significant, central functionality. * Define scenarios and use cases with substantial architectural coverage or that stress specific points of the architecture. | Software Architecture Document |
| Architectural Analysis | * Establish a potential system architecture by drawing on insights from experiences with comparable systems or within analogous problem domains. * Specify the system's architectural patterns, essential mechanisms, and modeling conventions. * Outline the strategy for reusing components and structures within the system design. | Use-Case Realization Specifications, Deployment Model, Software Architecture Document, Design Model |
| Identify Design Mechanisms | * Refine the analysis mechanisms into design mechanisms based on the constraints imposed by the implementation environment. | Design Model, Software Architecture Document |

| Incorporate Existing Design Elements | * Examine the interactions among analysis classes to identify potential design classes. * Enhance the architecture by integrating reuse opportunities where applicable. * Recognize standardized solutions for frequently encountered design challenges. * Incorporate crucial design model elements within the Logical View section of the Software Architecture Document. | Design Model, Software Architecture Document |
| --- | --- | --- |
| Describe Distribution | * Describe how the functionality of the system is distributed across physical nodes. | Software Architecture Document, Deployment Model |
| Identify Design Elements | * Analyze interactions of analysis classes to identify design model elements. | Design Model |

As a designer, Huyền and Hùng were responsible for the system design process, during which the responsibilities, operations, and attributes of the classes, along with the relationships between them are defined. Huyền did not deal with all the Use-Case Realization Specification documents by herself, however. She divided the work among the group so that every member wrote the Use-Case Realizations corresponding to the Use-Case Specifications the member was assigned by Minh. The following table outlines her activities as a system designer in the Analysis & Design process.

| Activity | Description | Output |
| --- | --- | --- |
| Use-Case Analysis | * Identify the classes which perform a use case’s flow of events. * Distribute the use case behavior to those classes, using use-case realizations. * Identify the responsibilities, attributes and associations of the classes. | Analysis classes, Use- Case Realization, Design Model, Analysis Model |

|  | * Note the mechanisms. | usage | of | architectural |  | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Use-Case Design | * Refine use-case realizations in terms of interactions. * Refine requirements on the operations of design classes. | | | | Use-Case Realization | | |
| Class Design | * Ensure that the class provides the behavior required by the use-case realizations. * Ensure that sufficient information is provided to unambiguously implement the class. * Handle non-functional requirements related to the class. * Incorporate the design mechanisms used by the class. | | | | Design Updates Model. | to | Classes, Design |

As a database designer, Hùng was responsible for defining the tables, indexes, views, keys, constraints and other database-specific attributes necessary to store, retrieve, update and delete persistent objects.

# Conclusion

As third-year university students with limited experience in software projects and System Analysis & Design (SAD), our group, comprised of Group 49 members, has designed a Hotel Management System based on the knowledge acquired from the SAD course and other courses undertaken before and during the Fall 2023 semester. Throughout the project, we diligently modeled business processes and translated them into system requirements, capturing them in both textual and UML graphical forms. Employing the Model-View-Controller (MVC) architecture, we devised a system design that served as the foundation for a runnable prototype, showcasing the envisioned system functionalities. Despite our efforts, we acknowledge that, as learners, mistakes are inevitable. Therefore, we are committed to further research and continuous improvement, with the aim of refining our work and delivering a final, polished software product. The lessons learned from this experience will undoubtedly contribute to enhancing our knowledge and skills, paving the way for the delivery of superior products in future endeavors.