**SOFTWARE DESIGN SPECIFICATION**



**SRM System**

**HIT Team**

Consulting

Sales

Staffing

Support

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| **Author(s)** | All team |
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| **Team name** | HIT Team |
| **Team members** | Thanh Giang, Hiep Ta, Phuc Nguyen, Giang Nguyen, Dat Tran, Huy Huynh |
| **Project mentors** | Mr. Hung Anh |
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# Document Reviewer Information

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Contents

[**1.** **Document description** 4](#_Toc322214941)

[**1.1.** **Purpose and audience:** 4](#_Toc322214942)

[**1.2.** **Document organization:** 4](#_Toc322214943)

[**1.3.** **References and relevant document:** 6](#_Toc322214944)

[**2.** **Project overview** 6](#_Toc322214945)

[**2.1.** **Purpose** 6](#_Toc322214946)

[**2.2.** **Scope** 6](#_Toc322214947)

[**2.3.** **Stakeholders** 7](#_Toc322214948)

[**3.** **Architectural drivers** 8](#_Toc322214950)

[**4.** **System context** 8](#_Toc322214951)

[**5.** **Physic Perspective** 9](#_Toc322214952)

[**5.1.** **Primary presentation:** 9](#_Toc322214953)

[**5.2.** **Element catalog:** 9](#_Toc322214954)

[**5.2.1.** **Elements and their properties** 9](#_Toc322214955)

[**5.2.2.** **Relations and their properties** 10](#_Toc322214956)

[**5.2.3.** **Element interfaces** 11](#_Toc322214957)

[**5.2.4.** **Element behavior** 11](#_Toc322214958)

[**5.3.** **Context diagram** 11](#_Toc322214959)

[**5.4.** **Architecture background** 11](#_Toc322214960)

[**5.4.1.** **Rationale design** 11](#_Toc322214961)

[**5.4.2.** **Analysis of results** 12](#_Toc322214962)

[**5.4.3.** **Assumptions reflected in the design** 12](#_Toc322214963)

[**6.** **Static Perspective** 13](#_Toc322214964)

[**6.1.** **Primary presentation:** 13](#_Toc322214965)

[**6.2.** **Element catalog:** 14](#_Toc322214966)

[**6.2.1.** **Elements and their properties** 14](#_Toc322214967)

[**6.2.2.** **Relations and their properties** 16](#_Toc322214968)

[**6.3.** **Context diagram:** 16](#_Toc322214969)

[**6.4.** **Architecture background:** 16](#_Toc322214970)

[**6.5.** **Glossary of terms:** 17](#_Toc322214971)

[**6.6.** **Other information:** 17](#_Toc322214972)

[**7.** **Data Model** 17](#_Toc322214973)

[**8.** **Dynamic Perspective** 18](#_Toc322214974)

[**8.1.** **Primary presentation:** 18](#_Toc322214975)

[**8.2.** **Element catalog:** 19](#_Toc322214976)

[**8.2.1.** **Elements and their properties** 19](#_Toc322214977)

[**8.2.2.** **Relations and their properties** 20](#_Toc322214978)

[**8.2.3.** **Element behavior** 21](#_Toc322214979)

[**8.3.** **Context diagram:** 21](#_Toc322214980)

[**8.4.** **Architecture background:** 22](#_Toc322214981)

[**8.4.1.** **Rationale design** 22](#_Toc322214982)

[**8.4.2.** **Analysis of results** 22](#_Toc322214983)

[**8.4.3.** **Assumptions reflected in the design** 22](#_Toc322214984)

[**8.5.** **Glossary of terms:** 22](#_Toc322214985)

[**9.** **Solution background** 22](#_Toc322214986)

[**9.1.** **Architectural Approaches** 22](#_Toc322214987)

1. **Document description**
   1. **Purpose and audience:**

This document provides a high level overview of the evolving technical architecture for the Sales System of a retail chain using a loyalty card point system. It also provides a high-level description of the goals of the architecture, the use cases support by the system and architectural styles and components that have been selected to best achieve the use cases.

In addition to these views, this architectural description will:

* Identify the candidate patterns and tactics that will become the architecture design of the system.
* Frame the architectural design activity, begin with the given technical constraints and the structures
* Identify patterns generally suit the needs described in the product description based upon the quality attribute scenarios
* Identify tactics we apply to further refine the initial decomposition of the system and promote the necessary quality attributes.

The architecture has a set of guiding principles as well as known criteria and constraints that shape the proposed architecture. It is intended to capture and convey the significant architectural decisions which have been made on the system.

The development team can use this document to review the architecture of the system. The Architecture document will be also useful for future development teams.

* 1. **Document organization:**

Sub-sections of Section 1 include the following.

* Section 1.1: Purpose and audience: Describe who the intended audience and organizations are and what they might use the document for.
* Section 1.2: Document organization: Describe the overall organization of the document. List the major sections of the document and describe what concerns each section addresses.
* Section 1.3: Common notation: List any notation that will be used throughout the document.
* Section 1.4: Terminology and definitions: Define any terms used throughout the document and provide context for terminology.
* Section 1.5: References and relevant document: List any other relevant documents that the reader might need to refer to, and most importantly, describe their relationships to this document and why the reader might want to (or need to) refer to them.

Sub-sections of Section 2 include the following.

* Section 2.1 and 2.2: This section describes the project and its purpose and scope, why the system is being built.
* Section 2.3: List the relevant stakeholders, their organizations, and how they will interact with the system.

Sub-sections of Section 3 include the following: *In this section describe the architectural drivers for the system.*

* Section 3.1: Use-case diagram of the system and list the priority of the use-case
* Section 3.2: Business Constraints and Technical Constraint of the system and list the priority of these constraints
* Section 3.3: Quality Attributes and Technical Constraint of the system and list the priority of these Quality Attributes

Sub-sections of Section 4 include the following: The system context is the first step in design and should include at least one context drawing. In addition to the context drawing, we show the scope of the system being described by showing its relationship to external entities like systems, peripherals, organizations, and stakeholders as necessary to describe the context drawing. We also describe the relative perspective of the context drawing or drawings.

Sub-sections of Section 5-6-7-8-9 include the following: specify the software architecture. Views specify elements of software and the relationships between them. A view corresponds to a viewpoint and is a representation of one or more structures present in the software

Sub-sections of Section 10 include the following, which is an index of architectural elements and relations telling where each one is defined and used in this SAD. The section also includes a glossary and acronym list.

* 1. **References and relevant document:**

|  |  |
| --- | --- |
| **Name** | **Description** |
| **Sales System of a retail chain using a loyalty card point system** | System description |
| **Architecting software intensive systems** | A practitioner’s guide, Anthony J. Lattanze |

1. **Project overview**
   1. **Background and Scope**
      1. **Background**

Van Lang University (VLU) is facing with an urgent problem in the management of student records because the number of students is increasing. VLU was founded 15 years and has 15 Faculty / Department training distributed in two facilities. The total student population of about 12,000 students and university receives about 3,000 students yearly

Difficulties:

## When start the school year, VLU have to hire many external employees to input record in several days so the operation is done manually so it very difficult and consume time

## Faculties/ Departments cannot report the number of record received during the day, statistical reports must wait until the record receiving process end.

## Process using tools such as paper documents, Excel file, Word file to the manage records of all students will make it hard to search later

* + 1. **Scope**

Student come to VLU yearly to perform admission procedures, they must bringing matriculated paper and other records to VLU. Firstly student have to pay the tuition at accounting agent and then go through take photograph, finally bring all to the faculty to complete admission process

The system does not manage the paying process, taking pictures; only manage the record submission process in the faculty.

Customers Want:

* Report about the number of received record to date for human resources office or managing board can see updated information promptly.
* The input records will be encrypted to management software student information, do not need to input again.
* The finding information faster without losing time as searches in paper or Excel file
* Statistics in the form of selecting a date, selecting faculty or by the total number of passing students

Software product SRM is developed to solve problems in current processes, as well as help users manage the profile of student at the university more effectively.

* 1. **Stakeholders**

|  |  |  |
| --- | --- | --- |
| ID | Name | Description |
| E01 | Administrator | * To have full access to the system. * Manage all kind of user account * Import Student Record for School |
| E02 | The Faculty Monitor | * Manage user account works for their faculty * Analysis statistics and report about the number received student records of their faculty * Import Student Record for Faculty |
| E03 | The Received Student Record Officer | * Update student record of their faculty * Analysis statistics and report about the number received student records of their faculty * Import Student Record for Faculty |
| E04 | The Training Department Officer | * Import Student Record for School * Analysis statistics and report about the number received student records of school |
| E05 | The Human Resource Department Officer | * Analysis statistics and report about the number received student records of school |
| E06 | The Management Committee | * Analysis statistics and report about the number received student records of school |

1. **Architectural drivers**

***Please reference to file “Architectural Driver”***

1. **System context**



**Users and roles:** Stakeholders who interact to Retail system was described in section 2.3.Stakeholder of this document.

**Channels:** Users will use different channels to access the system.

* Staff: Use website on PC locates at Retail Store to access to system.
* Manager: use website on everywhere PC to access to system.
* Cashier: Use Bar code reader at computer using store website to interacts with system
* Customer: Use online website to see their point
* Administrator: Use PC at Head Office to access the system

**Relationship Describe:**

The context diagram shows the input of stakeholders and output from system, direction of the arrows show the direction of information.

: Show that the input from user to the system

: Show that the output from system to the user

1. **Physic Perspective**

**ALLOCATION VIEW**

**(Deployment Style)**

* 1. **Primary presentation:**



* 1. **Element catalog:**
     1. **Elements and their properties**

.

|  |  |  |  |
| --- | --- | --- | --- |
| Associated Drawings:  Fig2 | | | Perspective:  Physic |
| No | **Name** | **Properties** | **Responsibilities** |
| 1 | Main Database | * It‘s a database run in database management system SQL server 2008 | * Contains all general data of system |
| 2 | Backup database | * It‘s a database run in database management system SQL server 2008 | * Contains all general data of system. Run parallel with the main database |
| 3 | WEB POS Application | * It’s a WEB application |  |
| 5 | Database Server | * OS: Windows Server 2008 * Processor: 1 x Intel® Xeon® Processor E5606 * Memory: 1 x 2GB DDR3 1333 240- * Hard Disk: DELL 250GB SATA 7.2K 3.0Gbs 3.5" Enterprise * ISoftware: Microsoft SQL Server 2008 Enterprise, .NET Framework 4.0 | * Run Main Database * Run Backup Database |
| 6 | WEB server | * Software: IIS 7.0 |  |
| 6 | User PC | * Operation System : Genuine Windows® 7 Home Basic, * Processor: AMD AM3 For Phenom™ II/Athlon™ II Family /Processors * Chipset: AMD SB710 * Graphics: ATI Radeon HD 3200, * Hard Drive SATA: 3.5" 320G * Software: Web browser | * Head office and Retail Store   + Run WEB SRM Application |
| 7 | Fiber router | * Vigor2950 | * Connect LAN with WAN |
| 8 | LAN | * Topology: Star * Use switch to connect elements in LAN | * Connect computers in a store |
| 11 | Fiber cable |  | * Connect fiber router in WAN by fiber port |

* + 1. **Relations and their properties**
    2. **Element behavior**
  1. **Architecture background**
     1. **Rationale design**

Deployment design satisfies quality attributes following:

* + 1. **Analysis of results**
    2. **Assumptions reflected in the design**

1. **Static Perspective**

**Module View**

**(Layered Style and Uses Style)**

* 1. **Primary presentation:**
  2. **Element catalog:**
     1. **Elements and their properties**
     2. **Relations and their properties**
  3. **Architecture background:**
  4. **Glossary of terms:**
  5. **Other information:**

1. **Data Model**

|  |  |  |  |
| --- | --- | --- | --- |
| Entity | Attributes | Data Type | Description |
| Bill | **Bill\_ID** | VARCHAR(11) |  |
| **POS\_ID** | VARCHAR(11) | Attribute said bill is made in which POS well as the general store |
| **Customer\_ID** | VARCHAR(9) | Customer pays the invoice. |
| **User\_ID** | VARCHAR(9) | Cashier |
| TotalCost | INT | The total cost of the bill, ensuring the implementation of Statistical Performance Data |
| Date | DATETIME | Paid Bill Date |
| PlusPoint | INT | Minus and plus points in a session will be stored here. |
| MinusPoint | INT |
| Product | **Product\_ID** | VARCHAR(11) |  |
| Product\_Name | NVARCHAR(50) |  |
| BasicCost | INT | AttributeBasic Cost show the default price of the product |
| **Category\_ID** | VARCHAR(11) |  |
| Bill\_Detail | **Bill\_ID** | VARCHAR(11) |  |
| **Product\_ID** | VARCHAR(11) |  |
| Quantity | INT | Sum Loyal Point of customer |
| Customer | **Customer\_ID** | VARCHAR(9) |  |
| Customer\_Name | NVARCHAR(50) |  |
| Customer\_Address | NVARCHAR(50) |  |
| Customer\_Phone | INT |  |
| SumPoint | INT | Sum Loyal Point of customer |
| RetailStore | **RetailStore\_ID** | VARCHAR(11) |  |
| RetailStore\_Name | NVARCHAR(50) |  |
| Cost | **Product\_ID** | VARCHAR(11) | Entity Cost said that Retail Store Retail Store selling a certain product and pricing individual products within a certain time. |
| **RetailStore\_ID** | VARCHAR(11) |
| DateStart | DATETIME |
| DateEnd | DATETIME |
| Cost | INT |
| Category | **Category\_ID** | VARCHAR(11) |  |
| Category\_Name | NVARCHAR(50) |  |
| RetailStore\_Category | **RetailStore\_ID** | VARCHAR(11) |  |
| **Category\_ID** | VARCHAR(11) |  |
|  | Quantity | INT |  |
| Computer | **Computer\_MAC** | VARCHAR(11) |  |
| **RetailStore\_ID** | VARCHAR(11) | This Attribute tells us this POS Terminal is placed at which Retail Store |
| User | **User\_ID** | VARCHAR(9) |  |
| User\_Name | NVARCHAR(50) |  |
| User\_Address | NVARCHAR(50) |  |
| User\_Phone | INT |  |
| Password | INT |  |
| **RetailStore\_ID** | VARCHAR(11) | This Attribute tells us this user works at which Retail Store |

1. **Dynamic Perspective**

**Component and Connector View**

* 1. **Primary presentation:**

**Head Office C&C View**

* 1. **Element catalog:**
     1. **Elements and their properties**
     2. **Relations and their properties**
     3. **Element behavior**
  2. **Context diagram:**
  3. **Architecture background:**
     1. **Rationale design**
     2. **Analysis of results**
     3. **Assumptions reflected in the design**
  4. **Glossary of terms:**

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1. **Solution background**
   1. **Architectural Approaches**
2. **Mapping between perspectives** 
   1. **Mapping between a module view and a component-and-connector view**
   2. **Mapping between module view and allocation view.**

|  |  |
| --- | --- |
| Element in Allocation View | Element in Module View (Data Model) |
| Main Database | **Head Office:**   * + Bill   + Bill\_Detail   + User   + Product   + Category   + Cost   + POS   + Customer   + RetailStore\_Category |

## -- The End --