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| Architecture Driver Specification |
| Human Resource Management |
| Define architectural drivers and the development strategy for HRM system. The document was written follow the online template for architectural drivers specification |

6/5/2012

Contents

[1.1 Purpose 3](#_Toc316548620)

[1.2 Definition and Acronyms 3](#_Toc316548621)

[Catalog Management 6](#_Toc316548622)

[5.1 Quality Attribute List 7](#_Toc316548623)

[5.2 Quality Attribute Scenario 8](#_Toc316548624)

[*Key Quality Attributes- Performance (QA01)* 8](#_Toc316548625)

[*Key Quality Attributes- Modifiability (QA05)* 9](#_Toc316548626)

[*Key Quality Attributes- Usability (QA03)* 11](#_Toc316548627)

[*Key Quality Attributes- Flexibility (QA04)* 12](#_Toc316548628)

[*Key Quality Attributes- Security (QA02)* 12](#_Toc316548629)

[6.1 Technical Constraints 13](#_Toc316548630)

[6.2 Business Constraints 13](#_Toc316548631)

[7.1 Priority Scale 13](#_Toc316548632)

[7.2 Difficulty Ranking Scale 14](#_Toc316548633)

[7.3 Functional Requirement 14](#_Toc316548634)

[7.4 Quality Attribute Scenarios 14](#_Toc316548635)

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Version | Author | Description |
| 11/4/2011 | 1.0 | Tường Nguyễn | Update use case, technical constraint, project overview and quality attributes |
| 11/7/2011 | 1.0.1 | Tân Trần | Update quality attribute description and scenarios for performance |
| 11/7/2011 | 1.0.2 | Tân Trần | Update scenarios for modifiability |
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| 11/8/2011 | 1.0.4 | Tân Trần | Update scenarios for usability and availability |
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| 11/22/2011 | 1.0.6 | Tường Nguyễn | Update Function Priority, QA Priority, Technical Constraints |
| 11/25/2011 | 1.0.7 | Tường Nguyễn | Update Scenario of Performance, Availability |
| 11/29/2011 | 1.0.8 | Tân Trần | Update Scenario of Scalability, Security |
| 1/6/2012 | 1.0.9 | Tân Trần | Update quality attribute |
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| 4/13/2012 | 1.0.11 | Tường Nguyễn | Update Functional Requirement |
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| 4/22/2012 | 1.0.13 | Tường Nguyễn | Update System Context, Quality Attribute, Functional Requirement |

1. Introduction

# 1.1 Purpose

The function of Human Resources departments is generally administrative and common to all organizations. Organizations may have formalized selection, evaluation, and payroll processes. The HR function consists of tracking existing employee data which traditionally includes personal histories, skills, capabilities, accomplishments and salary. To reduce the manual workload of these administrative activities, Van Lang University began to electronically automate many of these processes by introducing specialized Human Resource Management Systems.

# 1.2 Definition and Acronyms

|  |  |
| --- | --- |
| **Name** | **Description** |
| HRM | Human Resource Management |
| HRM Staff | The employee who is working in Human Resource Department |
| VLU | Van Lang University |

2. Project Overview

HRM is particularly developed for human resource management in university / colleges. The system consists of key modules:

* Personal information management
* Employee labor contract management
* Recruitment & training processing
* Payroll
* Administration panel – Utilities
  1. **Context diagram**



|  |  |  |
| --- | --- | --- |
| **Number** | **Actor** | Description |
| 1 | Department Manager/ Vice Department Manager (Human Resource Planning and Managing Department) | * Manage all general information * Decentralize staff about using function of system * Use all features |
| 2 | Insurance Group | * Manage information about insurance for labor, insurance premiums, subsidize for staff: maternity, sickness… |
| 3 | Administrator | * Manage and maintain system. * Fix defect in software. |
| 4 | Manage Labor Group | * Manage work hour, workload of staff, lectures * Manage time and attendance tracking |
| 5 | Salary group | * Staff of salary group is responsible for payroll management and employee management. * Manage about reward for labor |
| 6 | Assessment Group | * Assess emulation title * Assess performance |
| 7 | Human Resource Group | * Manage Recruitment * Responsible for Personal Information Management * Manage labor contract |
| 8 | Authentication System | * Be a system that is integrated from the outside * Responsible for system decentralization |

3. Architecture Driver Overview

The architectural drivers presented in this document include:

* **Functional Requirements:** These requirements are presented in the form of specifications and use cases.
* **Quality Attribute Requirements:** These requirements are presented in the form of quality attribute scenarios.
* **Business Constraints:** They include schedule, cost, and procedural demands that will impact how the system is designed or implemented
* **Technical Constraints**: they specify that a particular product, tool, language, OS, platform, network, protocol, algorithm, and so forth must be used in the system.

These architectural drivers will influence the architectural design and implementation of the project. Additionally, they will impact the schedule and quality of the project. As a whole these architectural drivers define the scope of the project.

4. High Level Functional Requirement

The high-level functional requirements of this project have been classified into seven categories

1. FR01. Detail Information Management
2. FR02. Training Management
3. FR03. Extended Information Management
4. FR04. Profile Management
5. FR05. Income Management
6. FR06. Catalog Management
7. FR07. User Management

**FR01. Detail Information Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Description** | **Actor** |
| UC.01 | Manage Detail | The system will allow the HRM staff to manage general information of staff/lecture. | HRM Staff |
| UC.02 | Certificate Management | The system should allow the HRM staff to manage the certificate (languages, computer…) of the staff/lecture in VLU | HRM Staff |
| UC.03 | Column Setting | Allowing the user to set column of information that need to be viewed. | HRM Staff |
| UC.04 | Employee Code Setting | Allowing the head of HR Department or Administrator to be able to set the format of code for employee. | HRM Chief, Administrator |

**FR02. Training Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Description** | **Actor** |
| UC.05 | Training Course | The system should allow the HRM staff to view/edit/update the information about training course of the staff/lecture in VLU | HRM Staff |
| UC.06 | Internal Training | The system should allow the HRM staff to view/edit/update the information about the internal training of staffs/lecture in Van Lang University. | HRM Staff |
| UC.07 | Training Result | The system should allow the HRM staff to view/edit/update the result after finishing the training course. | HRM Staff |

**FR03. Extended Information Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Description** | **Actor** |
| UC.08 | Manage Staff History | The system should allow the HRM staff to view/edit the information of staffs before working in Van Lang University. | HRM Staff |
| UC.09 | Manage Supported People | The system should allow the HRM staff to view/edit the number of supported people and their information, for the purpose of the family allowances. | HRM Staff |
| UC.10 | Manage Family Relationship | The system should allow the HRM staff to view/edit the family relationship and their information of staffs | HRM Staff |
| UC.11 | Manage Lecture Probation | The system should allow the HRM staff to keep track of probation process of the lecture | HRM Staff |
| UC.12 | Manage Staff Internship | The system should allow the HRM staff to view/edit the information about the internship of the staff. | HRM Staff |
| UC.13 | Manage Reward or Penalty or Emulation | The system should allow the HRM staff to view/edit the process of reward or penalty of the staff | HRM Staff |
| UC.14 | Manage Lecture Position | The system should allow the HRM staff to keep track of changing in the position and academic title of the lecture | HRM Staff |
| UC.15 | Manage Facilitate | The system should allow the HRM staff to view/edit the providing the facilitates for the staff | HRM Staff |
| UC.16 | Manage Union | The system should allow the HRM staff to view/edit the changes of the staff when they have joined union activities | HRM Staff |
| UC.17 | Manage Trade Union | The system should allow the HRM staff to view/edit the information of the lecture/staff when they have joined in the trade union at the VLU | HRM Staff |
| UC.18 | Manage Communist Party Task | The system should allow the HRM staff to view/edit the changes of the staff when they have joined party activities | HRM Staff |
| UC.19 | Manage Task | The system should allow the HRM staff to view/edit the information about the process of work this staff at the working place. | HRM Staff |

**FR04. Profile Management**

*The staffs can update profile information by accessing to VLU website.*

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Description** | **Actor** |
| UC.20 | Manage Syllabus | The system should allow the HRM staff or lecture can update the information about the syllabus in lecture’s profile. | HRM Staff/ Lecture |
| UC.21 | Manage Thesis Guidance | The system should allow the HRM staff or lecture can update the information about the thesis/guidance in lecture’s profile | HRM Staff/ Lecture |
| UC.22 | Manage Subject | The system should allow the HRM staff or lecture can update the information about the subject in lecture’s profile | HRM Staff/ Lecture |
| UC.23 | Manage Other | The system should allow the HRM staff or lecture can update the information about the article in lecture’s profile | HRM Staff/ Lecture |

**FR05. Income Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Description** | **Actor** |
| UC.24 | Manage Salary Coefficient | The system should allow the HRM staff to view/edit/update the information about salary coefficient of the staff/lecture in VLU | HRM Staff |
| UC.25 | Manage Income | The system should allow the HRM staff to view/edit/update the information about income of staffs/lecture in Van Lang University. | HRM Staff |

# FR06. Catalog Management

The system should allow the HRM user can view and updated the catalog which be used in HRM-PIM system. The list of catalog is described in SRS document.

**FR07. User Management**

The system should check the user name and password to ensure that the user is allowed to use the system. The system may allow the authorized user to use the functions corresponding to their assigned role.

5. Quality Attribute Requirements

# 5.1 Quality Attribute List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **System quality attributes** | | | | |
| **ID** | **Scenario ID** | **Quality attributes** | **Description** | **Concern** |
| QA.01 | **QAS.01** | **PERFORMANCE** | The ability of HRM software to handle many user interactions (100 users) when the HRM staffs modify the Personal Information. The response time of HRM system for each user interaction will be improved about 4-6 seconds. | The performance of displaying resource |
| **QAS.02** | **PERFORMANCE** | The performance when the HRM staffs want to import the data (decision) to save in HRM system. The time for importing data is about 5 seconds for 500 rows and 20 columns.  The time for exporting data is about 5 seconds for 500 rows and 20 columns | The performance of importing and exporting data files |
| **QAS.03** | **PERFORMANCE** | The performance when the HRM staffs when they export the files for reporting. The response time for importing and exporting for detail information statistical report is about 6-7 seconds. | The performance of reporting |
| QA.02 | **QAS.04** | **SECURITY** | The HRM use WCF service so that the user will not know the path of database server and database is protected from attackers.  The HRM is also support the authentication function to assign the permission to users. Each user can access or see the button depend on their role. | The authentication of user |
| QA.03 | **QAS.05** | **USABILITY** | -The HRM system have the consistent screens and easy to uses. In addition, the personal information is grouped into different category so that it will be easier to find the information  -The HRM system provide adequate user document including help, user manual and tutorials for user guidance  -HRM system supports to show multiple views. | Easy for learning and using new system |
| QA.04 | **QAS.06** | **SCALABILITY** | Now, the HRM system uses SQL Database server but the HRM can also run on other database MySQL. | The ability to change database server |
| **QAS. 07** | **SCALABILITY** | HRM system support to be able to extend amount of user (about 100 -150 users) that access to the software by upgrading the current server or replacing the new one | The addition of new user/access |
| QA.05 | **QAS.08** | **MODIFIABILITY** | The HRM system supports the developers or maintainer can easy add new function or modify the current function whenever the business rules are change. The first release of HRM system just focuses on “Personal Information Management”. However, there will be more modules, which will be added to system in next release, for example recruitment, insurance…modules. | The addition of new function on HRM system |
| **QAS.09** | **MODIFIABILITY** | At the system runtime, the administrator can modify authority of the certain user by editing the configure file without stopping the system | The user configuration |
| **QAS.010** | **MODIFIABILITY** | In Profile Management, the HRM allows modifying the client from using Silverlight to Windows Form (WPF). | The modification from web application to window form |

# 5.2 Quality Attribute Scenario

## *Key Quality Attributes- Performance (QA01)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to handle many user interactions when they modify the “Personal Information”** | | **ID: QA.01** | **Version: 1.1** |
| **Last Changed: 11/25/2011** |
| **Quality attribute:** Performance | | **Characterization ID:** QAS.01 | |
| **Describe stakeholder role proposing the description:** The HRM staffs, Architect | | | |
| Source(s) of the stimulus | The HRM staffs who responsible for modifying the “Personal Information” | | |
| Stimulus | Updating or Modifying the “Personal Information” in both detailed and extended information. | | |
| Relevant environmental conditions | The HRM system is in normal mode.  The number of user transactions is 500. | | |
| Architectural elements | The HRM system | | |
| System response | The HRM system process all transaction:   * Update the new information to database * Log the transaction. | | |
| Response measure(s) | The response time for each transaction is about 4-6 seconds. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **The performance when the HRM staffs want to import /export the data (decision) to save in HRM system.** | | **ID: QA.01** | **Version: 1.1** |
| **Last Changed: 11/25/2011** |
| **Quality attribute:** Performance | | **Characterization ID:** QAS.02 | |
| **Describe stakeholder role proposing the description:** The HRM staffs, Architect | | | |
| Source(s) of the stimulus | The HRM staffs | | |
| Stimulus | The HRM staffs want to import the data, the decisions into database of HRM system | | |
| Relevant environmental conditions | The HRM system is in normal mode. | | |
| Architectural elements | The HRM system | | |
| System response | All of data and decision are imported into database of HRM system. | | |
| Response measure(s) | The response time for importing data is about 5 seconds for 500 rows and 20 columns.  The response time for exporting data is about 5 seconds for 500 rows and 20 columns. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **The performance when the HRM staffs want to report** | | **ID: QA.01** | **Version: 1.1** |
| **Last Changed: 18/1/2012** |
| **Quality attribute:** Performance | | **Characterization ID:** QAS.03 | |
| **Describe stakeholder role proposing the description:** The HRM staffs, Architect | | | |
| Source(s) of the stimulus | The HRM staffs | | |
| Stimulus | The HRM staffs want to report the personal information statistical of staffs in VLU in installed template | | |
| Relevant environmental conditions | The HRM system is in normal mode. | | |
| Architectural elements | The HRM system | | |
| System response | The system get data needed to report and export to report file in template provided by customer | | |
| Response measure(s) | The response time for reporting (the personal information statistical report) is about 6-7 seconds. | | |

## *Key Quality Attributes- Modifiability (QA05)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to add new functionalities/modules such as recruitment, insurance… modules** | | **ID: QA.05** | **Version: 1.0** |
| **Last Changed: 11/7/2011** |
| **Quality attribute:** Modifiability | | **Characterization ID:** QAS.08 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The developer, end-users | | |
| Stimulus | The first release of HRM project is focusing on Personal Information Management module. But in next release the user wish to   * Add new functionalities/modules including recruitment, insurance, labor contract, payroll, assessment management, reward and penalty management, labor management modules | | |
| Relevant environmental conditions | The HRM system is in build time | | |
| Architectural elements | The HRM system client and server side | | |
| System response | -Locates places in architecture to be modified.   * The UI component on client side * The services and business flow on server side.   -Makes modification without affecting other functionality  -Tests modification  -Deploys modification | | |
| Response measure(s) | The time for adding: 2-3 days  The resource for adding: 2 resources (one for integration and the other for testing and deploy) | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to modify the authority of the user** | | **ID: QA.05** | **Version: 1.0** |
| **Last Changed: 11/7/2011** |
| **Quality attribute:** Modifiability | | **Characterization ID:** QAS.09 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | Administrator | | |
| Stimulus | Modifying the authority of the user | | |
| Relevant environmental conditions | The HRM system is in run time mode | | |
| Architectural elements | The HRM system server side | | |
| System response | -The system will load configure again  -The authority of the user will be changed | | |
| Response measure(s) |  | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to modify the client from using Silverlight to Windows Form (WPF)** | | **ID: QA.05** | **Version: 1.0** |
| **Last Changed: 11/7/2011** |
| **Quality attribute:** Modifiability | | **Characterization ID:** QAS.010 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The developer, end-users | | |
| Stimulus | Wish to modify the client side from using Silverlight (web browser application) to windows form application (WPF) | | |
| Relevant environmental conditions | The HRM system is in build time | | |
| Architectural elements | The HRM system client | | |
| System response | -Locates part for modification   * The View and Model component   -Makes modification without affecting the functionality in other tiers  -Tests UI | | |
| Response measure(s) | The time for modifying: 5-7 days  The resource for adding: 2 resources (one for modifying and the other for testing and deploy) | | |

## *Key Quality Attributes- Usability (QA03)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to make user feel comfortable** | | **ID: QA.03** | **Version: 1.0** |
| **Last Changed: 11/8/2011** |
| **Quality attribute:** Usability | | **Characterization ID:** QAS.05 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The end-users | | |
| Stimulus | Want to feel comfortable and easy to use with the UI | | |
| Relevant environmental conditions | The HRM system is in run time | | |
| Architectural elements | The HRM system user interface | | |
| System response | * The personal information is group into different category so that it will be easier to find the information. * HRM support the help and tutorial for user guidance. * HRM system supports to show multiple views. | | |
| Response measure(s) |  | | |

## *Key Quality Attributes- Scalability (QA04)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to run on multi database** | | **ID: QA.04** | **Version: 1.1** |
| **Last Changed: 11/29/2011** |
| **Quality attribute:** Scalability | | **Characterization ID:** QAS.06 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The HRM database server | | |
| Stimulus | Now, the HRM system uses SQL Database server but the HRM can also run on other database MySQL | | |
| Relevant environmental conditions | The HRM system is in normal mode | | |
| Architectural elements | The HRM database | | |
| System response | The system can work well with new database | | |
| Response measure(s) | The time for changing to new database: 3 days | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to extend the user access to the software by upgrading the current server or buy new one with high performance** | | **ID: QA.04** | **Version: 1.1** |
| **Last Changed: 04/14/2012** |
| **Quality attribute:** Scalability | | **Characterization ID:** QAS.07 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The end-user | | |
| Stimulus | Now, the HRM system is accessed by many users than usual (larger than 100 users). | | |
| Relevant environmental conditions | The HRM system is in normal mode | | |
| Architectural elements | The HRM system | | |
| System response | The system can work well with large amount of users | | |
| Response measure(s) | Expanded amount of user: 100- 150 users | | |

## *Key Quality Attributes- Security (QA02)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of scenario:**  **Ability to protect the database from attacker** | | **ID: QA.02** | **Version: 1.1** |
| **Last Changed: 11/29/2011** |
| **Quality attribute:** Security | | **Characterization ID:** QAS.04 | |
| **Describe stakeholder role proposing the description:** Architect | | | |
| Source(s) of the stimulus | The unauthorized user | | |
| Stimulus | Access and attack database server | | |
| Relevant environmental conditions | The HRM system is in normal mode | | |
| Architectural elements | The HRM database, HRM server | | |
| System response | - Only the users have the right to use the system.  - The user will not know the path of database server and database is protected. | | |
| Response measure(s) |  | | |

6. Constraints

# 6.1 Technical Constraints

|  |  |  |
| --- | --- | --- |
| **ID** | **Constraint name** | **Constraint Description** |
| TC.PIM.1 | Development framework | .Net 4.0, WCF, Silverlight, Entity framework |
| TC.PIM.2 | Network | Network is ADSL/Mega WAN |
| TC.PIM.3 | Programming language | Using C# |
| TC.PIM.4 | Third-party | - Using Microsoft Word, Excel for documenting, importing, and exporting the data.  - Use the Authentication component from Van Lang IT Center |

# 6.2 Business Constraints

|  |  |  |
| --- | --- | --- |
| **ID** | **Constraint name** | **Constraint description** |
| BC.PIM.7 | Time limitation | The end of the project is in April 31st,2012 |

7. Prioritization

# 7.1 Priority Scale

The priority scale has been defined priority of functional requirement.

|  |  |  |
| --- | --- | --- |
| Priority (numeric) | Priority (name) | Description |
| 1 | Must Have | Must be present in the end product at all costs. |
| 2 | Should Have | Very important features that distinguish a system from others, significant to users and business. |
| 3 | Nice to have | Customer would greatly appreciate implementation of these features. |

# 7.2 Difficulty Ranking Scale

The difficulty ranking scale has been defined on the basis of complexity and effort. Complexity is defined as how difficult the design of a solution is and whether the team has previous experience in designing or implementing such a design. Both measures, for complexity and effort, are relative to each other.

|  |  |
| --- | --- |
| Difficulty (numeric) | Description |
| 1 | High complexity and large amount of effort required |
| 2 | High complexity or large amount of effort required |
| 3 | Moderate complexity and medium amount of effort required. |

# 7.3 Functional Requirement

The lower priority, the higher importance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Functional Requirement** | **Stakeholder ranking** | **Difficulty Ranking** | **Priority** |
| FR.01 | Detail Information Management |  | 1 | **1** |
| FR.02 | Training Management |  | 2 | **1** |
| FR.03 | Extended Information Management |  | 2 | **1** |
| FR.04 | Profile Management |  | 1 | **2** |
| FR.05 | Income Management |  | 1 | **1** |
| FR.06 | Catalog Management |  | 3 | **1** |
| FR.07 | User Management |  | 2 | **2** |

We choose function which have high priority (>1) to deliver in given schedule, the other function will defer because they are not value with stakeholder and high risk. If we choose to implement them, the late delivery will occur.

# 7.4 Quality Attribute Scenarios

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Quality attributes** | **Difficulty ranking (1,2,3)** | **Stakeholder ranking** | **Priority** |
| QA.01 | Performance | 1 |  | **2** |
| QA.02 | Security | 1 |  | **1** |
| QA.03 | Usability | 1 |  | **3** |
| QA.04 | Scalability | 2 |  | **2** |
| QA.05 | Modifiability | 3 |  | **1** |