**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Vietnamese Sign Language Recognition**

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-Ho Chi Minh City, 31/05/2015-

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# Table of Contents

[Table of Contents 3](#_Toc420855817)

[Definitions, Acronyms, and Abbreviations 4](#_Toc420855818)

[A. Report No. 3 Software Requirement Specification 5](#_Toc420855819)

[1. User Requirement Specification 5](#_Toc420855820)

[2. System Requirement Specification 5](#_Toc420855821)

[2.1 External Interface Requirement 5](#_Toc420855822)

[2.2 System Overview Use Case 5](#_Toc420855823)

[2.3 List of Use Case 6](#_Toc420855828)

[3. Software System Attribute 11](#_Toc420855829)

[3.1 Usability 11](#_Toc420855830)

[3.2 Reliability 12](#_Toc420855831)

[3.3 Availability 12](#_Toc420855832)

[3.4 Security 12](#_Toc420855833)

[3.5 Maintainability 12](#_Toc420855834)

[3.6 Portability 12](#_Toc420855835)

[3.7 Performance 12](#_Toc420855836)

# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Definition** |
| VSLR | Vietnamese Sign Language Recognition |
|  |  |
|  |  |
|  |  |

# Report No. 3 Software Requirement Specification

## User Requirement Specification

The system is not only reserved for mute person but also everyone who wants to learn sign language. Therefore, we have determined the requirement from these users.

* Translate his or her signs to text and sound.
* Manage the sign language of the system.
* Learn the sign from a word.
* It musts be easy to control the hardware.
* The system is portable.

## System Requirement Specification

### External Interface Requirement

External interface is concerned with designing interactive products to support the way people communicate and interact in their everyday and working lives. The products must be usability means easy to learn, effective to use and provide an enjoyable experience.

#### User Interface

#### Hardware Interface

#### Software Interface

#### Communication Protocol

### System Overview Use Case

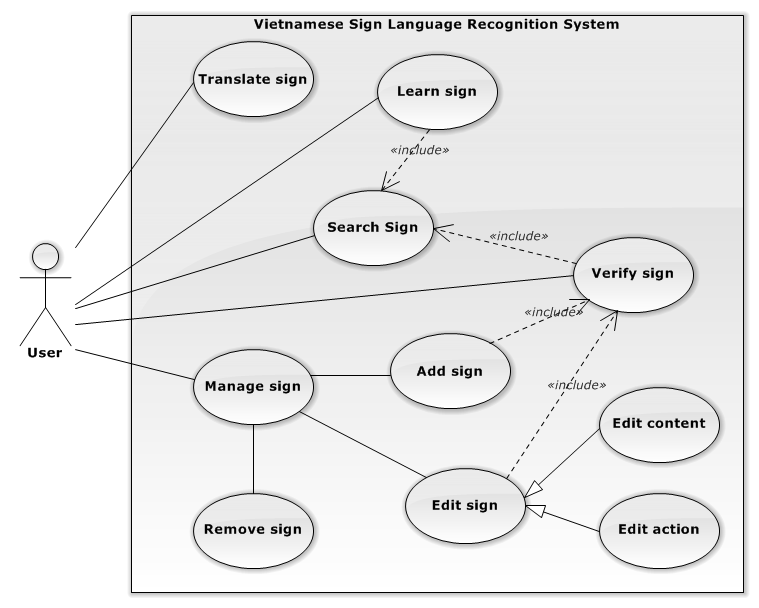
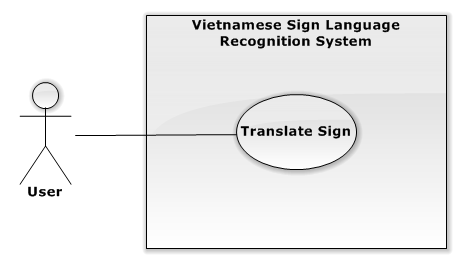


Figure 2: System Overview Use Case



### List of Use Case

#### Translate Sign Use Case

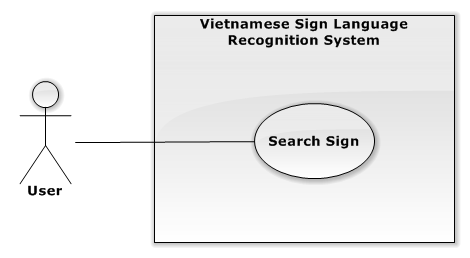
****

**Figure 3: Translate sign use case diagram**

**Use Case Specification**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **USE CASE -1 SPECIFICATION** | | | | | |
| **Use-case No.** | VSLR001 | **Use-case Version** | | | 1.0 |
| **Use-case Name** | Translate Sign | | | | |
| **Author** | Nguyễn Hữu Kỳ Long | | | | |
| **Date** | 31/05/2015 | | **Priority** | High | |
| **Actor**   * User   **Summary**   * The use case describes the way translating hand sign language.   **Goal**   * Recognize hand signs and translate them to content with the kind of sound and text.   **Triggers**   * User uses his or her specific “select” hand signs on the “Translate” button to select “Translate Sign” function.   **Preconditions**   * The background color and hand color must be analyzed.   **Post Conditions**   * **On Success**: The content of hand signs shows on the screen and speaker.   **Main Success Scenario**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User shows hand signs on the camera | - The system shows the mean of the current sign.  - The system will capture his or her sign every second. After that, it will show the current content. | | 2 | User shows “end” hand sign. | - The system will end capturing when getting the “end” sign. At the same time, the system will show the whole content which was translated.  [Alternative No.1] | | 3 | User selects “Continue” case by making specific “select” sign on the “Continue” button. | - The system moves back to step 1.  [Alternative No.2] |   **Alternative Scenario**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User shows the specific “delay” hand sign on the camera. | - The system will delay at the same time. | | 2 | User selects “End” case by making specific “select” sign on the “End” button. | - The system navigates to main screen. |   **Exceptions**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | |  |  |  |   **Relationships**   * N/A   **Business Rules**   * N/A | | | | | |

#### Search Sign Use Case

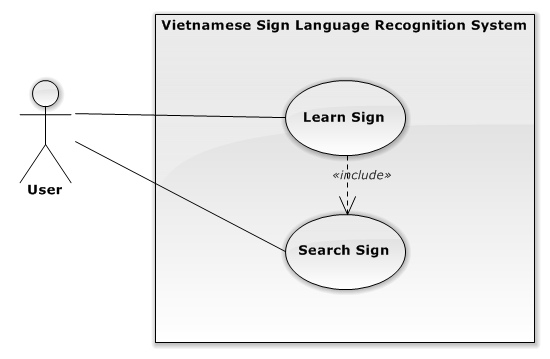


**Figure 4: Search sign use case diagram**

**Use Case Specification**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **USE CASE -2 SPECIFICATION** | | | | | |
| **Use-case No.** | VSLR002 | **Use-case Version** | | | 1.0 |
| **Use-case Name** | Search Sign | | | | |
| **Author** | Nguyễn Hữu Kỳ Long | | | | |
| **Date** | 31/05/2015 | | **Priority** | Medium | |
| **Actor**   * User   **Summary**   * The use case describes the way user find the particular hand sign.   **Goal**   * It is to help user knowing clearly the existing signs in the database of the system.   **Triggers**   * User uses his or her specific “select” hand signs on the “Database” button to select “search database” function.   **Preconditions**   * The background color and hand color must be analyzed.   **Post Conditions**   * **On Success**: The sign image will be shown on the screen.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 |  | - The system shows the mean of whole hand signs. | | 2 | User keeps the “hold” sign and move up or move down the hand on the camera. | - The system will scroll up or down the table of sign language. | | 3 | User takes the “select” sign at the area of a word. | - The system shows the image of that word on the right of the screen. | | 4 | User takes the “select” sign on the button “Finish” | - The system navigates to main screen.  [Alternative No.1] |   **Alternative Scenario**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User takes the “select” sign on the button “Learn” | - The system navigates to the screen for learning that hand sign. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | |  |  |  |   **Relationships**   * N/A   **Business Rules**   * N/A | | | | | |

#### Learn Sign Use Case



**Figure 4: Learn sign use case diagram**

**Use Case Specification**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **USE CASE -3 SPECIFICATION** | | | | | |
| **Use-case No.** | VSLR003 | **Use-case Version** | | | 1.0 |
| **Use-case Name** | Learn Sign | | | | |
| **Author** | Nguyễn Hữu Kỳ Long | | | | |
| **Date** | 31/05/2015 | | **Priority** | High | |
| **Actor**   * User   **Summary**   * The use case describes the way to take a particular hand sign.   **Goal**   * It is to help user training his or her hand gesture more accurately.   **Triggers**   * User uses his or her specific “select” hand signs on the “Learn” button at the “Search Sign” screen to select “Learn Sign” function.   **Preconditions**   * The background color and hand color must be analyzed. * The word which user wants to learn musts be selected.   **Post Conditions**   * **On Success**: The system shows the mean of the hand sign which is capturing.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 |  | - The system shows the image explaining the way to take hand gesture. | | 2 | User puts his or her hands in the model which is drawn on the image. | - The system will capture from camera and show the meaning of the current hand gesture. | | 4 | User takes the “select” sign on the button “Finish” | - The system navigates to main screen.  [Alternative No.1] |   **Alternative Scenario**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User takes the “select” sign on the button “Back” | - The system navigates to the screen for searching others. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | |  |  |  |   **Relationships**   * N/A   **Business Rules**   * N/A | | | | | |

#### Verify Sign Use Case

#### Add Sign Use Case

#### Edit Content Sign Use Case

#### Edit Action Sign Use Case

#### Remove Sign Use Case

## Software System Attribute

### Usability

The system should be designed for everyone can use easily in controlling and GUI operations.

#### Graphic User Interface

* The system musts show all instructions and operations in Vietnamese.

#### Usability

* User just needs to read the user manual which is enclosed with the system for using in the first time. The attached manual guide must be clear. User can read and do by themselves.

#### Hardware controlling

* User can control the device very easily as well as using any electronic device in the daily live.

### Reliability

* The database should be constructed on Vietnamese sign language.
* The result must be satisfiable to the user requirement with higher than 80% in accuration.
* The system runs continuously about 7 hours with 1500mAh battery and 3.5V to 5V battery. That means it is safe to user.

### Availability

### Security

### Maintainability

* When any electronic equipment, which is attached with the system, is out of ordered, it is so easy to change or to fix at any electronic store.
* The system can be extended in the future.

### Portability

* The system supplies the power source in which user can use for 7 hours without charging. In addition, the system also provides a USB charger and an electronic charger.
* The device should be designed as quite small and convenient.

### Performance