**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

The Traffic Sign Recognition and Training

|  |  |
| --- | --- |
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| **Capstone Project code** | TSRT |

-Ho Chi Minh City, 01/2014-

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***ACKNOWLEDGEMENTS***

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# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| TSRT | Traffic Sign Recognition and Training |
| TS | Traffic sign |

# Software User’s Manual

## Installation Guide

### Setting up environment at server site

The following software must be installed into the server machine:

#### Hardware requirements

VPS server to run the web and service

* CPU 1 Core 2.0GHz.
* 512MB of RAM.
* 20GB of hard disk.

A personal computer to access VPS server:

* CPU Core i3 2.0 GHz
* 4GB of Ram
* 300GB of hard disk

#### Software requirements

Software to run in VPS server:

* Java environment: Java 1.7.0\_51
* Web Server: Tomcat 7.0
* Operation system: Linux 13.10
* Database management: Mysql 5.20
* Other library:
* OpenCV 2.4.8
* Jsoncpp 0.5.0

Software to run in personal computer to process the deployment:

* SSH Client to access VPS server
* FTP Client to upload file to VPS server

In this guide we can use Firefox with FireSSH and FireFTP addon.

#### Mobile Requirement

* Android 4.0
* Camera 5.0 Megapixel or above

### Deployment at server side

#### Prepare deployment package

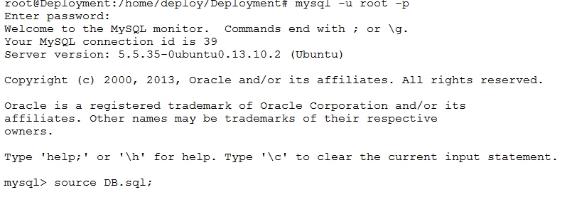
* From personal computer access to VPS using FireFTP and FireSSH
* Upload deployment package to a folder on server, for example /home/deploy/deployment.zip
* Extract the deployment.zip
* Run the install.sh script to install the requirement software and library (this may take about 1h or more depend on your VPS internet connection). Flow the guide of script to complete the installation.
* Reboot VPS



**Figure 1: Prepare deployment package**

#### Deploy database

* Using SSH client, extract DB.sql script by command: mysql –u root –p
* Enter your mysql root password
* Then extract database by command: source DB.sql;



**Figure 2: Deploy database**

#### Deploy web application on server

* Run tomcat server by script: startup.sh



**Figure 3: Run tomcat server**

* Copy 2 War file TrafficService.war, TrafficWeb.war to webapps folder of tomcat and wait to tomcat auto deploy the war file.



**Figure 4: Copy war file to tomcat server**

* Edit the console app path in config.properties file this case: /home/deploy/Deployment/TSRT/



**Figure 5: Set console application path**

* Edit the web service address in the config.properties of TrafficWeb: http://yourwebaddress/TrafficService/



**Figure 6: Set Web service address**

****

**Figure 7: Restart tomcat**

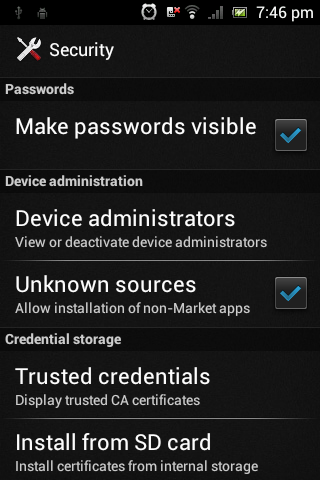
### Setting up the environment at client side

#### Setting up for computer

* The client devices need to have one of the following browsers to access the website:
* Google Chrome.
* Firefox.

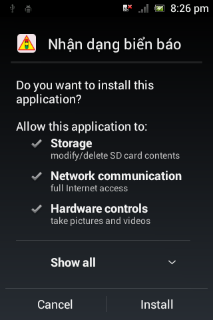
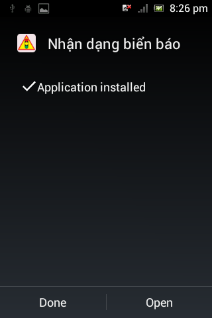
#### Setting up for Android devices

* Change setting to install unknown source apk.

****

**Figure 8: Change Settings**

* Use browser and goto address 192.168.218.1:2987, download the apk file.
* Click Install to install the app.

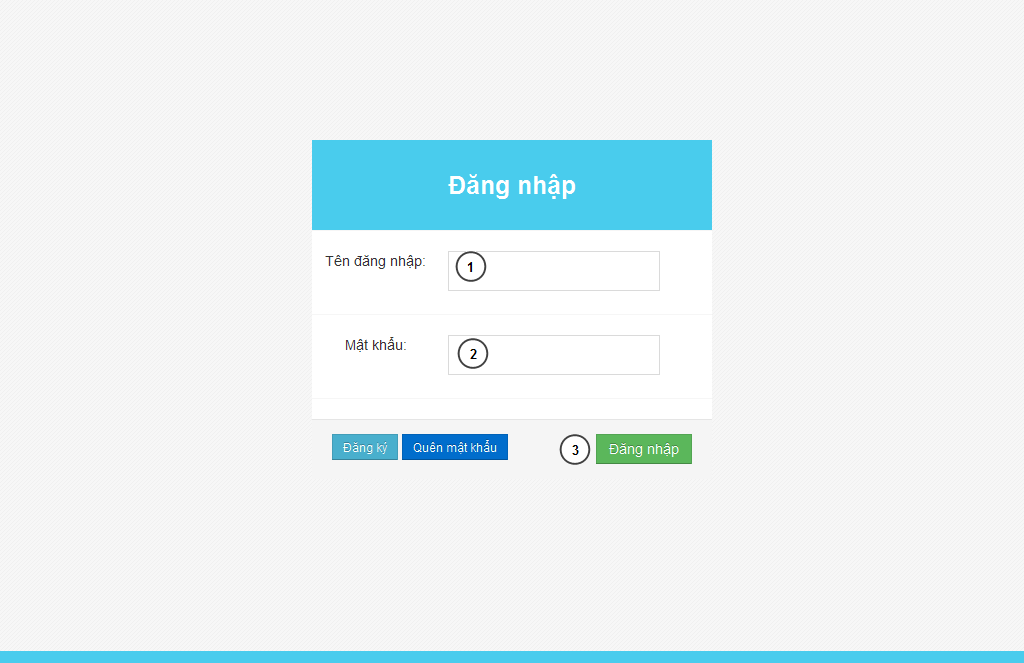
 

**Figure 9: Install App**

## User Guide

The user guide is based on the normal workflow of the system

### Login



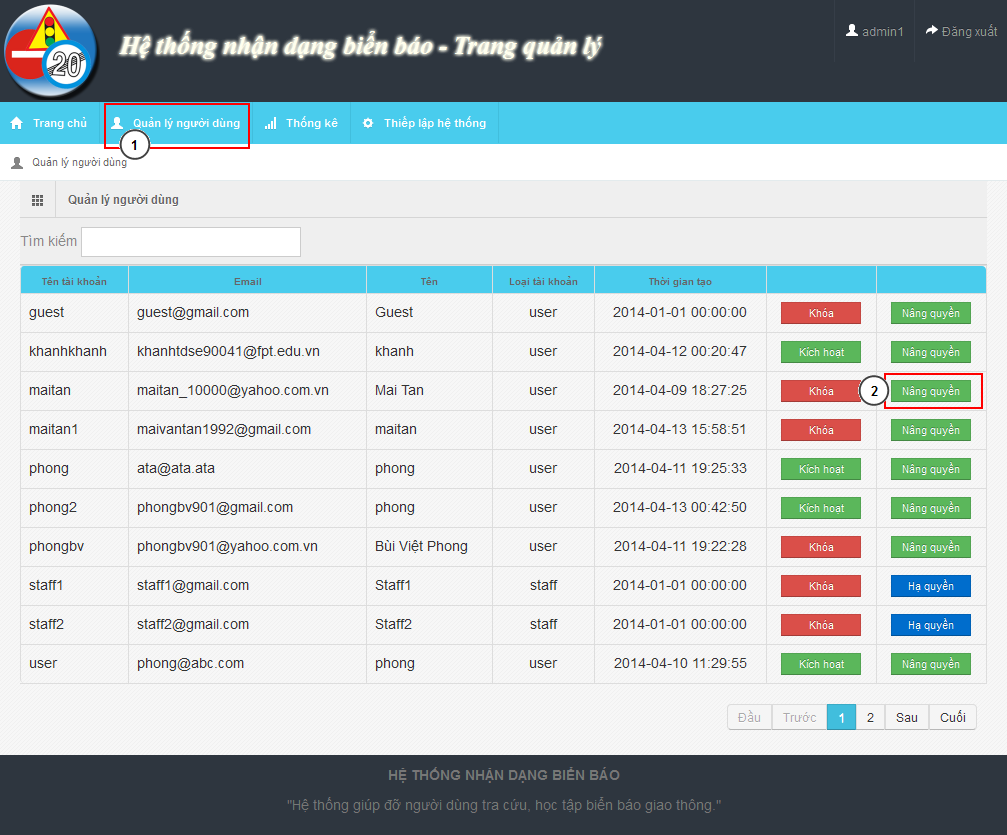
**Figure 10: Login Page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Fill UserID to “Tên đăng nhập” textbox |
| 2 | File password to “Mật khẩu” textbox |
| 3 | Press “Đăng nhập” button to login. |

**Table 1: Login Step**

### Admin

#### Set staff



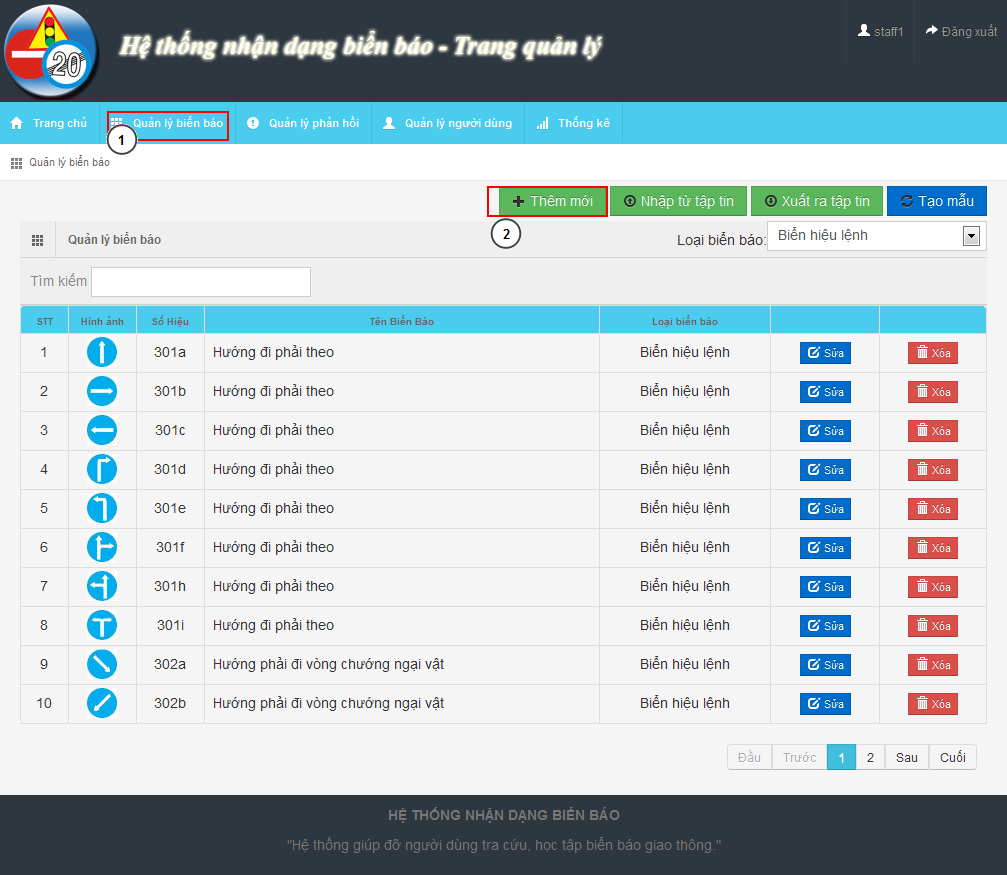
**Figure 11: Account Manage Page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | “Quản lý người dùng” menu |
| 2 | Find user want to set staff. Click “Nâng quyền” |

**Table 2: Set staff**

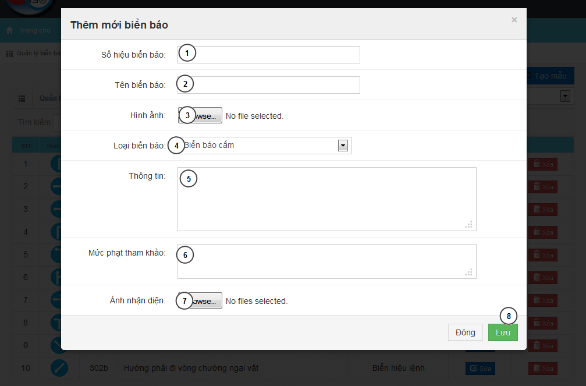
### Staff

#### Add new traffic sign



**Figure 12: Traffic Sign Manage Page**

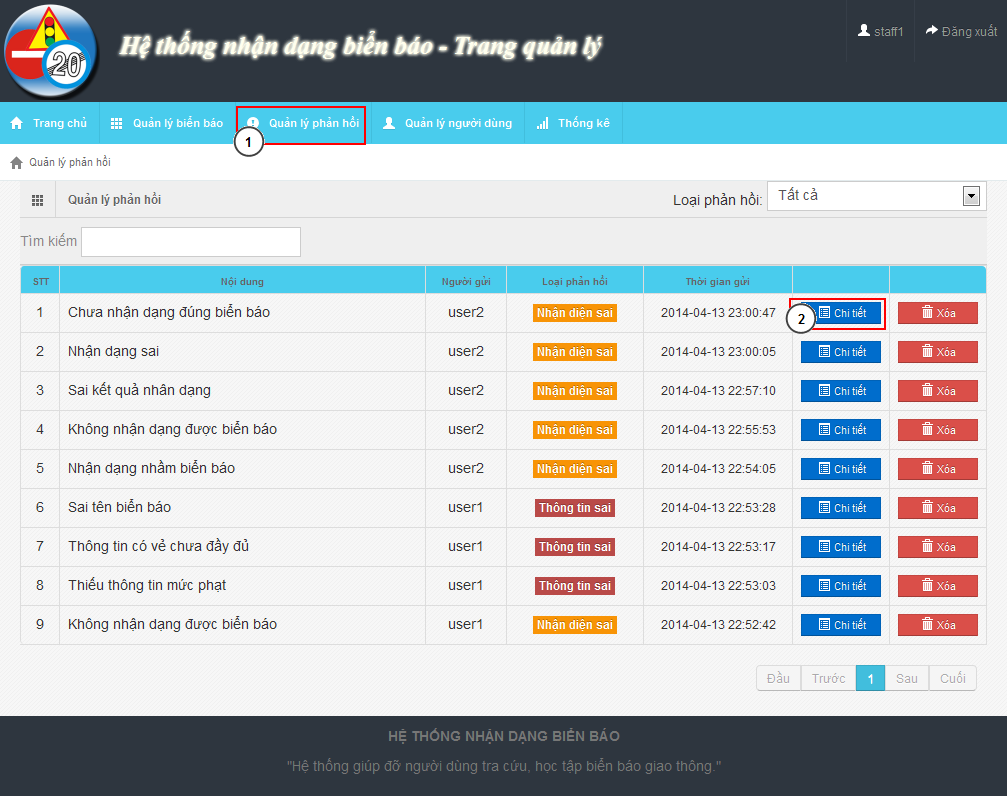
|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | “Quản lý biển báo” menu |
| 2 | Click on “Thêm mới” button to show Add new modal |



**Figure 13: Add New Traffic Sign Modal**

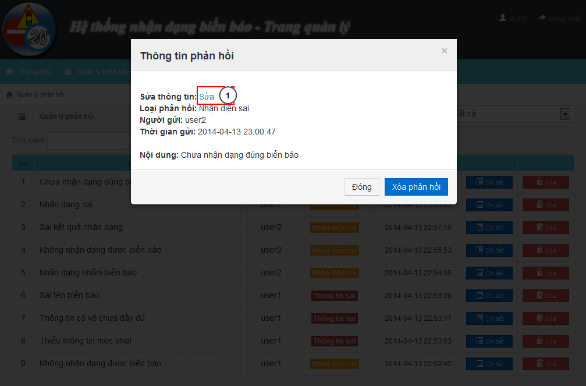
|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Input traffic sign label |
| 2 | Input traffic name |
| 3 | Input traffic image |
| 4 | Select traffic type |
| 5 | Input traffic sign information |
| 6 | Input traffic sign penalty fee |
| 7 | Input train image for traffic sign |
| 8 | Press “Lưu” button to save traffic sign |

#### Fix wrong recognition from report



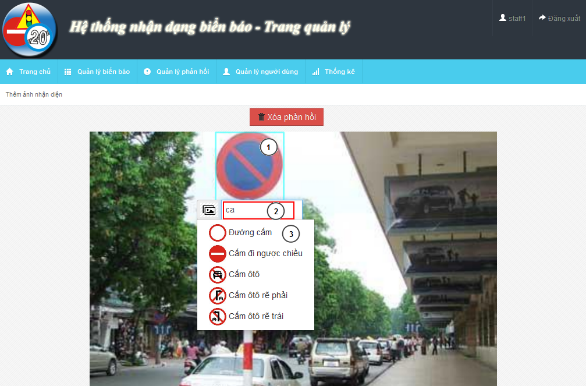
**Figure 14: Report Manage Page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | “Quản lý phản hồi” menu |
| 2 | Find the report and click “Chi tiết” to show detail of report |



**Figure 15: Report Detail Modal**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Click “Sửa” to edit the result |



**Figure 16: Edit Wrong Recognition Page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Move mouse to the detected area |
| 2 | Input text to find the right traffic sign name |
| 3 | Select traffic sign name match with the image |

### User – Mobile

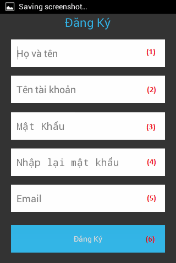
#### C:\Users\phongbv\Desktop\Do an\screen chot\login.pngLogin

**Figure 17: Login Screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Fill Username. Example: phongbv |
| 2 | Fill Password. Example: 123456 |
| 3 | Click “Đăng nhập” button |

**Table 3: Login Step**

#### Register

****

**Figure 18: Register Screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Fill fullname. Example: Bùi Việt Phong |
| 2 | Fill account name. Example: phongbv |
| 3,4 | Fill password. Example: 123456 |
| 5 | Fill email. Format email: abc@example.com |
| 6 | Press “Đăng ký” button |

**Table 4: Register Step**

#### Search Auto



**Figure 19: Search Auto Screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Press button to take picture and wait for result. |
| 2 | Click button switch on or off auto take picture mode. |
| 3 | Press button to select picture from mobile instead of take a picture by camera. |

**Table 5: Search auto step**

#### Search auto result

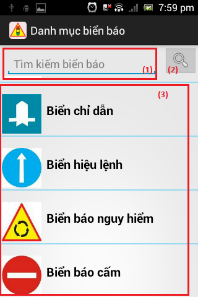


**Figure 20: Search auto result screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Picture was taken by user before. |
| 2 | List result, position match with number in the image. Select one item to view traffic sign detail |

**Table 6: Search auto result step**

#### Search manual



**Figure 21: Search manual Screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Fill search key. Example: “đường cấm”. |
| 2 | Click button to search by traffic sign’s name. |
| 3 | Select one category to view list traffic sign by category. |

**Table 7: Search manual step**

#### C:\Users\phongbv\Desktop\Do an\screen shot\list traffic.pngSearch manual result

**Figure 22: Search manual result Screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Select one traffic sign to view detail. |

**Table 8: Search manual result Step**

#### View traffic detail



**Figure 23: View traffic detail screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Press this button to report wrong information |
| 2 | Press this button to add or remove traffic sign to favorite |
| 3 | Traffic sign’s image |
| 4 | Traffic sign’s information |

**Table 9: View traffic detail step**

#### C:\Users\phongbv\Desktop\Do an\screen shot\favorite.pngView favorite

**Figure 24: View favorite screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Select one traffic sign to view detail. (Or hold for 1 second, then select “Xóa” to delelte traffic sign from favorite list) |

**Table 10: View favorite step**

#### View history



**Figure 25: View history screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Select one row to view search auto result detail. (Or hold for 1 second, then select “Xóa” to delelte result from history list) |

**Table 11: View history step**

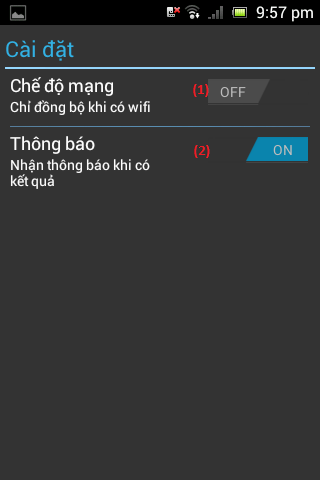
#### C:\Users\phongbv\Desktop\Do an\screen shot\feedback.pngSend Report

**Figure 26: Send report screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Enter report content. |
| 2 | Press this button to send report |

**Table 12: Send report step**

#### Setting



**Figure 27: Setting screen**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Press this button to turn on or off “synchronize when on wifi only” mode. |
| 2 | Press this button to turn on or off notification when have search auto result. |

**Table 13: Setting step**

### User - Website

#### Search auto

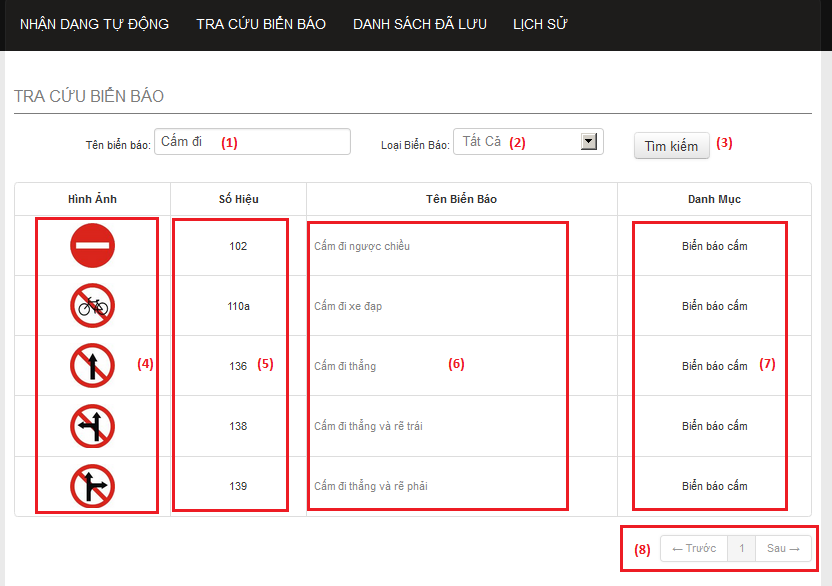


**Figure 28: Search auto page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Click button “Chọn tệp tin” to select image for upload and wait for a few seconds. |
| 2 | List result, position match with number in the image. Select one item to view traffic sign detail |
| 3 | Picture was uploaded by user before |
| 4 | Click button “Sai kết quả” to report if the result is wrong. |

**Table 14: Search auto step**

#### Search manual

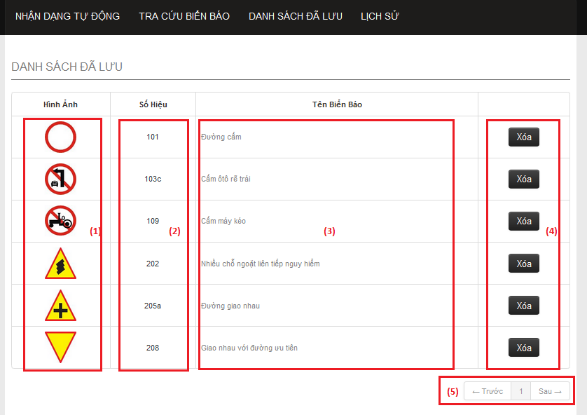


**Figure 29: Search manual page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Enter traffic sign’s name. Example: “cấm đi”. |
| 2 | Select one item to choose traffic sign category. |
| 3 | Click button “Tìm kiếm” to search traffic sign. |
| 4 | This column display traffic signs’ image. Click image to view traffic sign detail. |
| 5 | This column display traffic signs’ ID number. |
| 6 | This column display traffic signs’ name. Click traffic sign’s name to view traffic sign detail. |
| 7 | This column display traffic signs’ category. |
| 8 | Select number or “Trước”, “Sau” to view others records in the table. |

**Table 15: Search manual step**

#### View list favorite

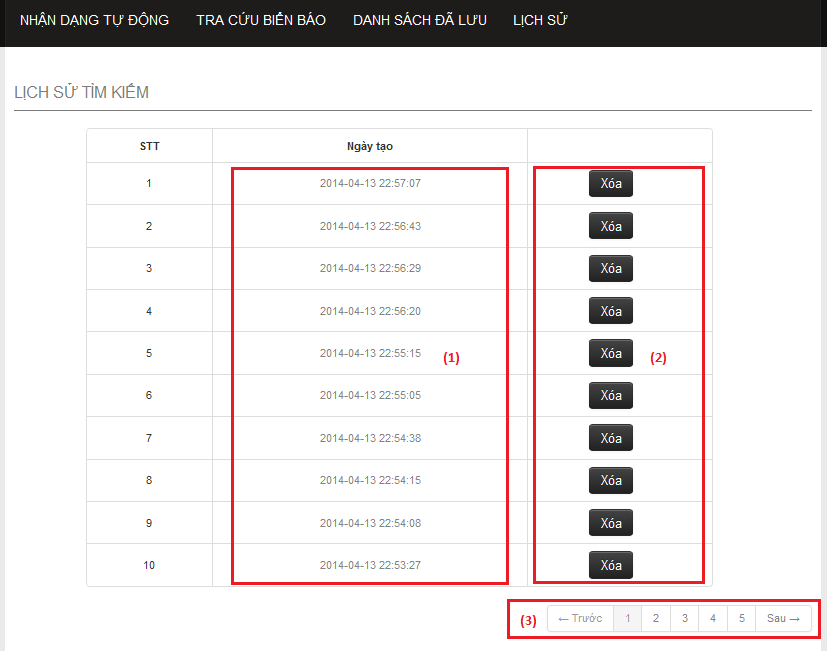


**Figure 30: Favorite page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | This column display traffic signs’ image. Click image to view traffic sign detail. |
| 2 | This column display traffic signs’ ID number. |
| 3 | This column display traffic signs’ name. Click traffic sign’s name to view traffic sign detail. |
| 4 | Click button “Xóa” to remove one traffic sign from favorite list. |
| 5 | Select number or “Trước”, “Sau” to view others records in the table. |

**Table 16: View favorite step**

#### View list history



**Figure 31: History page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | This column display the times when the history was created. Click link to view history detail. |
| 2 | Click button “Xóa” to remove one history from history list. |
| 3 | Select number or “Trước”, “Sau” to view others records in the table. |

**Table 17: View list history step**

#### View history detail

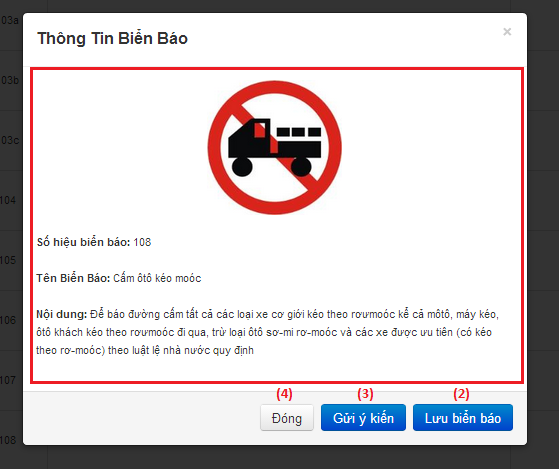


**Figure 32: History detail page**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | List result, position match with number in the image. Select one item to view traffic sign detail |
| 2 | Picture was uploaded by user before |
| 3 | Click button “Sai kết quả” to report if the result is wrong. |

**Table 18: View history detail step**

#### View traffic sign detail

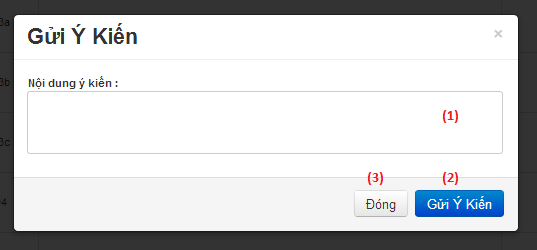


**Figure 33: Traffic sign detail popup**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Traffic sign’s detail information. |
| 2 | Click “Lưu biển báo” to add traffic sign to favorite list. |
| 3 | Click button “Gửi ý kiến” to report if the information is wrong. |
| 4 | Click button “Đóng” to close popup. |

**Table 19: View traffic sign detail step**

#### Send report



**Figure 34: Send report popup**

|  |  |
| --- | --- |
| **Step** | **Description** |
| 1 | Enter report content. |
| 2 | Click button “Gửi ý kiến” to send report. |
| 3 | Click button “Đóng” to close popup. |

**Table 20: Send report step**

## User Notice

### Image Data Notice

* Each traffic sign should have at least 5 images for train image.
* The image should be in good condition, not have too much noise, or hide by another object.

Example of good image data:



Sample data of a traffic sign about 5-10 images:

* 60% taken from front of traffic sign.
* 40% taken from to side of traffic sign about 30 degrees side long.

Example of a good sample data set:



Avoid using not clear images like these:

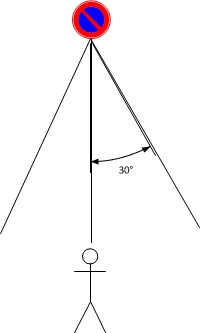


### Take image to search

The below is recommend for the best image when search auto:

* Position and angle:

The best position and angle is font up the traffic sign. In the worst case, make sure you have an angle about 30 degree in front up the traffic sign.



**Figure 35: Position and angle**

* The size of traffic sign in image:

By default the best size of traffic image is from 1/10 to ¼ of the width of image.



