

Table of Contents

Introduction.....	1
Website privileges based on access control.	2
For Visitors	2
Features of the application for visitor:	2
For Admin	3
Features of application for admin	3

Introduction

Air quality monitoring system is a web-based system that visualizes details about PM2.5 to show users the condition of air quality of various location in Thailand. It is user-friendly application allowing the user to interact with the application in a natural and intuitive way.

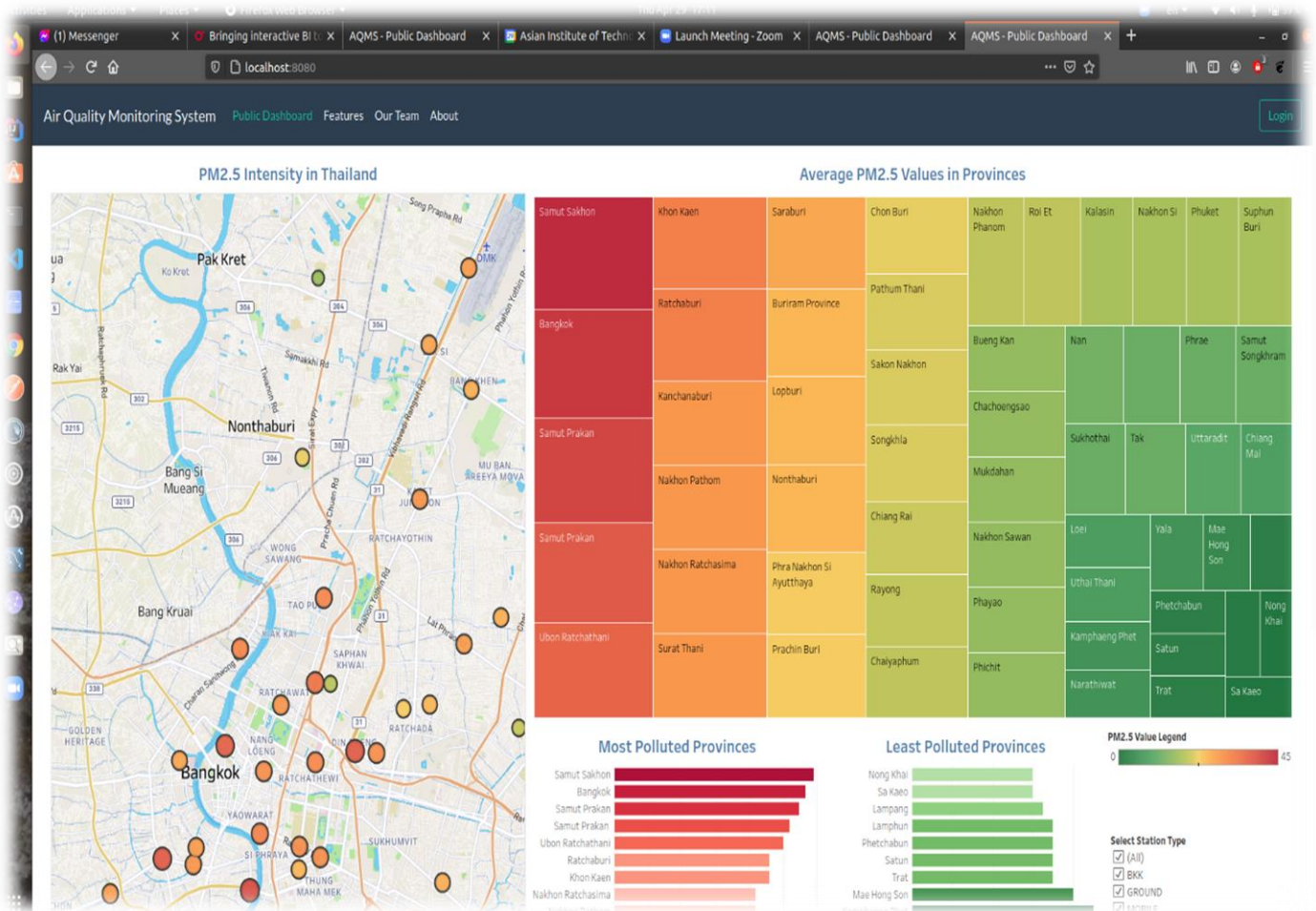


Figure 1. Home Page of application

Air Quality Monitoring system can be used by any users who wish to know about the quality of air of the location within the premises of various provinces of Thailand. Basically, there are two users: Admin and Visitors. These users have their own privileges and base on their privileges; the given steps can be followed to get the experiences of the system.

Website privileges based on access control.

For Visitors

Any users have the privilege to visit the system without registration /log in. Users can simply go to the site URL making a session to view the website and its contents. The webpage included a dashboard that contains descriptive overview of the PM2.5 and its intensity in various locations within Thailand.

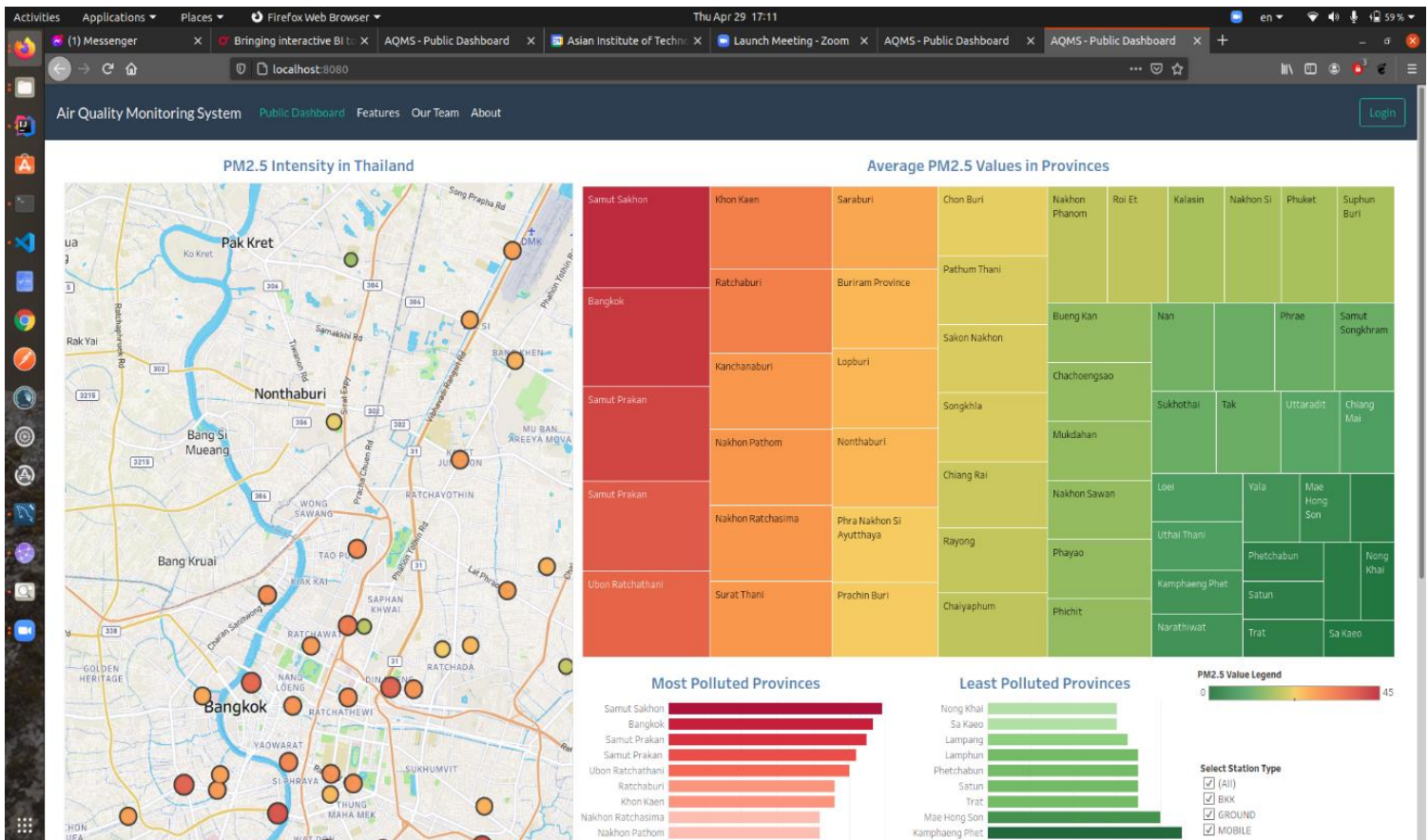


Figure 2. Dashboard view for visitors

Features of the application for visitor:

Our application contains a dashboard that includes:

- **Map view containing the value of PM2.5** of various location in Thailand with various colors used to represent the danger level of PM2.5. Here Green indicates it is a safe zone, yellow mean good, orange means moderate and red means it is getting worse.

- **Average value of PM2.5 of various provinces index of Thailand** based on available data and stations.
- **Bar graph showing most polluted provinces** based on the values of PM2.5
- **Bar graph showing values Least polluted provinces** based on the values of PM2.5

In order to have more details, user can simply put cursor on the features.

Close/Termination of Application

As soon as user closes the website, the session is terminated, and application is terminated.

For Admin

This system provides a more privilege to Admin making it easy for admin to handle the web application.

Features of application for admin

Admin can simply go on the URL and login with the credentials.

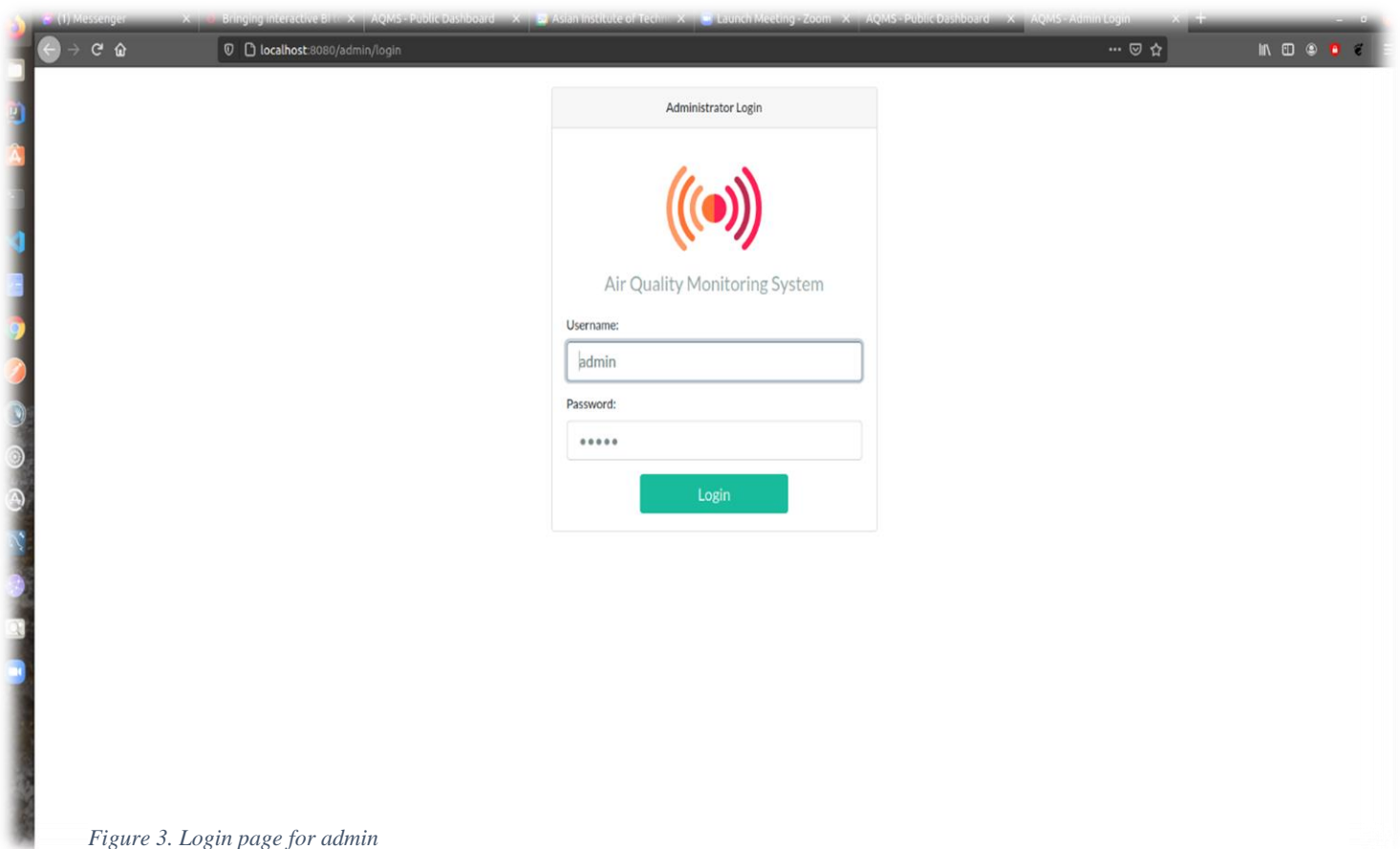


Figure 3. Login page for admin

On Login, the admin will be redirected to the admin Homepage. The homepage of admin contains dashboard similar to visitors. In addition to this, there are some menu options inside navigation bar.

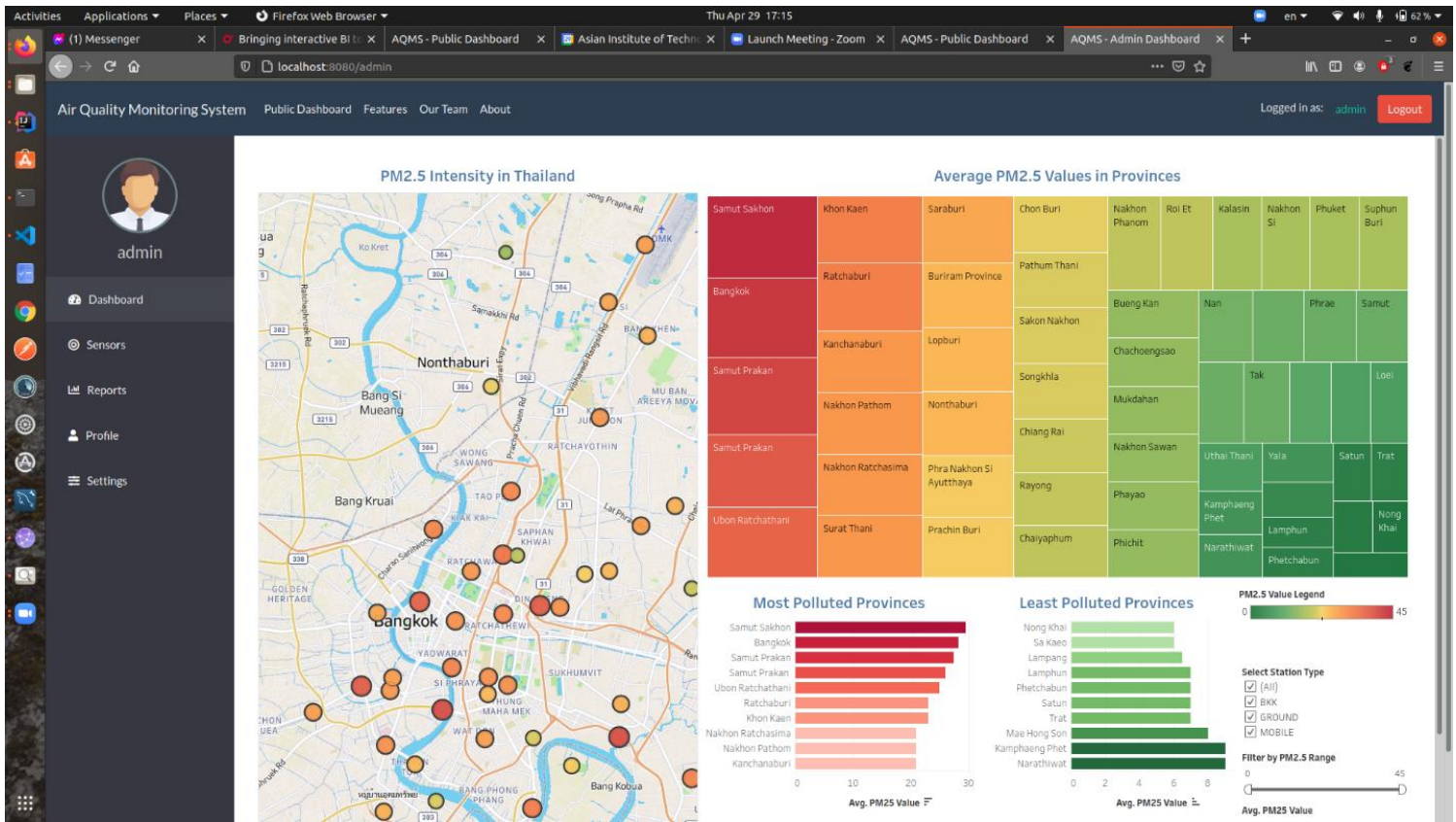


Figure 4. Homepage for Admin

Admin can see various menus on the left navigation bar.

1. **Dashboard** is like the visitor that contains all the features as mentioned above.
2. **Sensors** is for sensor management where admin can edit, disable, or delete sensors as per the need. This feature will be provided in near future. For now, admin can start and stop the server as per the need.

Activities Applications Places Firefox Web Browser Thu Apr 29 17:16

(1) Messenger x Bringing interactive BI... x AQMS - Public Dashboard x Asian Institute of Techn... x Launch Meeting - Zoom x AQMS - Public Dashboard x AQMS - Sensors Manage... x

localhost:8080/admin/sensors

Air Quality Monitoring System Public Dashboard Features Our Team About

Logged in as: admin Logout

admin

Dashboard

Sensors

Reports

Profile

Settings

Server Status: **Stopped**
 Refresh Interval: 300 seconds
 Last Update: 2021-04-29
 Number of Stations: 141

Start Server

Tabular Map View

Station ID	Name	Area	Station Type	PM2.5	Unit	Last Updated
02t	Bansomdejchaopraya Rajabhat University	Hiran Ruchi, Khet Thon Buri, Bangkok	GROUND	20	µg/m³	2021-04-29 17:00
03t	Highway NO.3902 km.13+600	Kanchanaphisek Rd, Bang Khun Thian, Bangkok	GROUND	29	µg/m³	2021-04-29 17:00
05t	Thai Meteorological Department	Bang Na, Khet Bang Na, Bangkok	GROUND	17	µg/m³	2021-04-29 17:00
08t	Prabadang Rehabilitation Center	Song Kanong, Phra Pradaeng, Samut Prakan	GROUND	22	µg/m³	2021-04-29 17:00
10t	National Housing Authority Klongchan	Khlong Chan, Khet Bang Kapi, Bangkok	GROUND	-	µg/m³	2021-04-29 17:00
11t	National Housing Huaykwang	Din Daeng, Khet Din Daeng, Bangkok	GROUND	18	µg/m³	2021-04-29 17:00
12t	Nonsi Witthaya School	Chong Nonsi, Khet Yannawa, Bangkok	GROUND	16	µg/m³	2021-04-29 17:00
13t	Department of Disease Control	Talat Khwan, Mueang, Nonthaburi	GROUND	16	µg/m³	2021-04-29 17:00
14t	Highway District	Om Noi, Krathum Baen, Samut Sakhon	GROUND	24	µg/m³	2021-04-29 17:00
16t	South Bangkok Power Plant	Bang Prong, Meuang, Samut Prakan	GROUND	19	µg/m³	2021-04-29 17:00
17t	Residence for Dept. of Mineral Resources	Talat, Phra Pradaeng, Samut Prakan	GROUND	15	µg/m³	2021-04-29 17:00
18t	City Hall, Samut Prakan	Pak Nam, Meuang, Samut Prakan	GROUND	33	µg/m³	2021-04-29 17:00
19t	National Housing Authority Bangplee	Bang Sao Thong, Bang Sao Thong, Samut Prakan	GROUND	19	µg/m³	2021-04-29 17:00
20t	Bangkok University Rangsit Campus	Khlong Nueng, Khlong Luang, Pathum Thani	GROUND	14	µg/m³	2021-04-29 17:00
21t	Ayutthaya Witthayalai School	Pratu Chai, Phra Nakhon Si Ayutthaya	GROUND	12	µg/m³	2021-04-29 17:00
22t	Sukhothai Thammathirat Open University	Bang Phut, Pak Kret, Nonthaburi	GROUND	14	µg/m³	2021-04-29 17:00
24t	Na Phra Lan Police Station	Na Phra Lan, Chaloem Phra Kiat, Saraburi	GROUND	19	µg/m³	2021-04-29 17:00
25t	Khao Noi Fire Station	Pak Phrao, Mueang Saraburi, Saraburi	GROUND	12	µg/m³	2021-04-29 17:00
26t	Environmental Office 8 ratchaburi	Na Mueang, Mueang, Ratchaburi	GROUND	23	µg/m³	2021-04-29 17:00
27t	Samut Sakhon Wittayalai School	Maha Chai, Mueang, Samut Sakhon	GROUND	25	µg/m³	2021-04-29 17:00

Figure 5. Shows the option to start sensors.

Air Quality Monitoring System Public Dashboard Features Our Team About

Logged in as: **admin** [Logout](#)

Server Status: Running
 Refresh Interval: 300 seconds
 Last Update: 2021-04-29
 Number of Stations: 141

[Stop Server](#)

Tabular [Map View](#)

Station ID	Name	Area	Station Type	PM2.5	Unit	Last Updated
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03t	Highway NO.3902 km.13 +600	Kanchanaphisek Rd, Bang Khun Thian, Bangkok	GROUND	29	µg/m³	2021-04-29 17:00
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12t	Nonsi Witthaya School	Chong Nonsi, Khet Yannawa, Bangkok	GROUND	16	µg/m³	2021-04-29 17:00
13t	Department of Disease Control	Talat Khwan, Mueang, Nonthaburi	GROUND	16	µg/m³	2021-04-29 17:00
14t	Highway District	Om Noi, Krathum Baen, Samut Sakhon	GROUND	24	µg/m³	2021-04-29 17:00
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27t	Samut Sakhon Wittayalai School	Maha Chai, Mueang, Samut Sakhon	GROUND	25	µg/m³	2021-04-29 17:00

Figure 6. Shows the option to stop the sensor.

- 3. Reports** is basically about the generating necessary reports based on the information that is available. It may contain forms fields like Title of Report, Descriptive Content, Export File Format, select sensors option, Date, and generate submit button. For now, we have option to export csv file.
- 4. Profile** allows admin to update the information about the admin like picture, name, email, job description and etc. This feature will be provided in near future.
- 5. Parameter Update** allows admin to modify dashboard tiles, dashboard layout, manage data and data source with available menu like Enable/Disable Dashboard Tiles, Modify Dashboard Layout, Manage Data Sources and Data Backup/Restore. This feature will be provided in near future.
- 6. Logout** menu simply make admin to log out from the admin webpage and redirect to visitor page.