



## **Air Quality Monitoring System**

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***AQMS***

**CS&303**  
***Database Management System***  
**FINAL REPORT**  
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# Database Management System in AQMS

Our topic is about the execution of a Database Management System (DBMS) in Air Quality Monitoring of Bangladesh (AQM). In this project report we will be going through the method of storing and managing data with a DBMS. Moreover, we will be demonstrating some phases. Those are - Preface, Requirement Analysis, Logical System Design, Physical System Design and Interpretation.

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## CHAPTER 01 : PREFACE

### CONTEXT OF THE ORGANIZATION :

The context of the organization is the **Ministry of Environment, Forest and Climate Change** is a ministry of the government of the People's Republic of Bangladesh whose role is ensuring the sustainable environment and optimum forest coverage. May 14, 2018 cabinet changed the name to Ministry of Environment, Forest and Climate Change. “ Ministry of Environment and Forest “ was its previous name. As we know our topic is about AQI so Bangladesh Meteorological department of Ministry will handle weather data.

### CONTEXT OF THE PROJECT :

AQI means Air Quality Index and it is a tool. This tool we use for reporting daily air quality of any city or country. By using this tool anyone can tell how clean polluted the air is and what associated health effects might be a concern for the public. The higher the AQI value, the greater the level of air pollution and the greater the health concern. In general AQI values below 100 are thought of as satisfactory but when AQI values are above 100, air quality is considered to be unhealthy at first for certain sensitive groups of people and after that for everyone as AQI values get higher. In Bangladesh the AQI is based on five standard pollutants.

### PURPOSE OF THE PROJECT :

- Daily release of air quality conditions to the public.
- Dispatch the health implications of air quality.
- Protect public interest and take actions to reduce emissions.
- Forecast air pollution level.

### OPPORTUNITY OF THE PROJECT :

Opportunity of the project is as we are changing an existing system, we have to ensure that the proposed system will be more effective than the existing one

# RICH PICTURE

## AS-IS

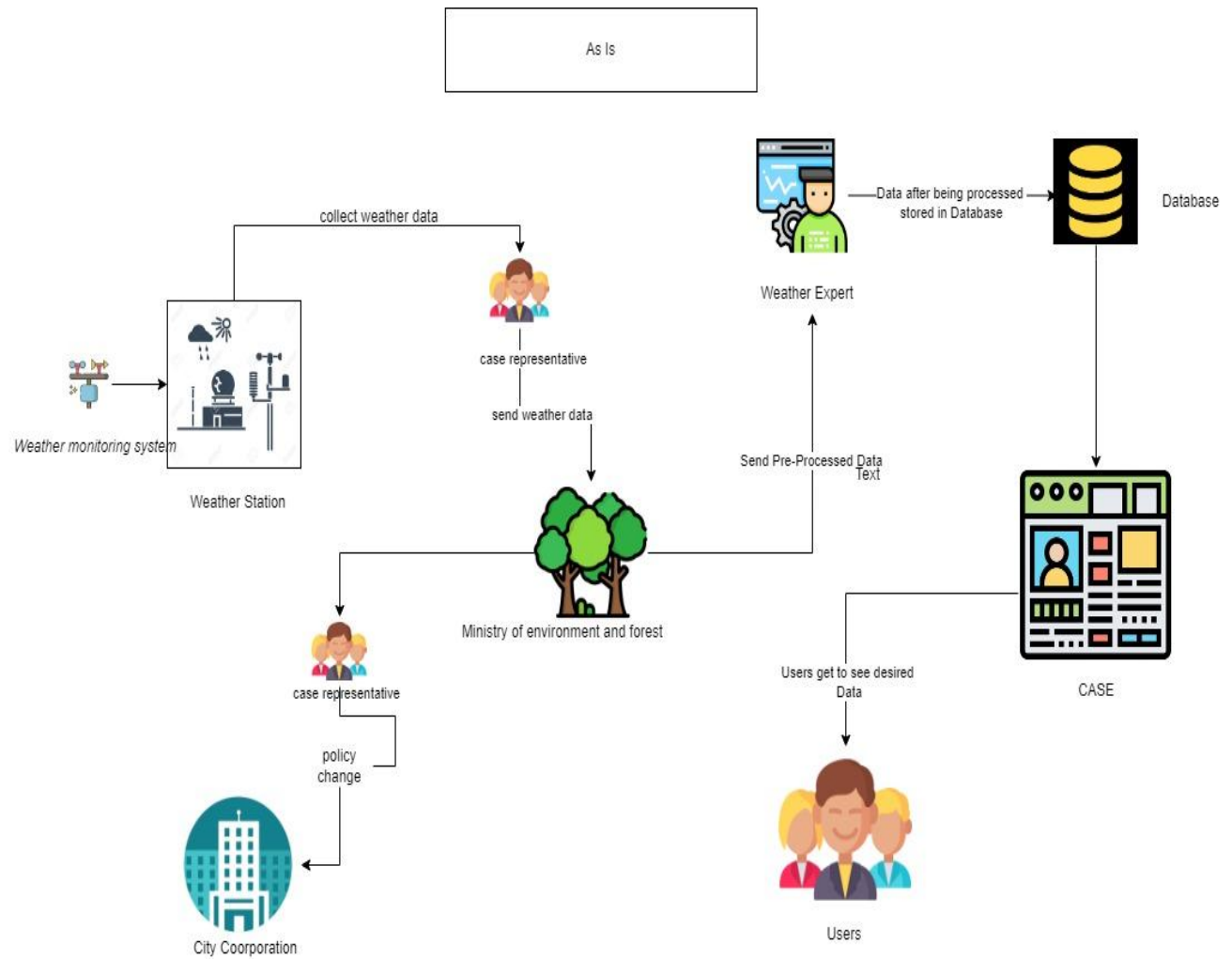


Figure : As-Is Rich picture

# SIX ELEMENT ANALYSIS

## AS-IS

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Communication & Network
<b>Data entry</b>	<b>A. Case Representative:</b> 1. Collect data from all weather monitor sensors. 2. Gather data from every weather station. 3. Choose appropriate data entry form. 4. Enter data in the system. 5. Click the save button. 6. Data must be saved in the database. <b>B. Admin:</b> 1. Logs into the CASE system. 2. Create new users for the system for validation . 3. Using setting the users	<b>A. Paper and Stationery :</b> 1. Paper can be used to store data and manually send the data to the case representative. 2. Case representatives can use paper to print data and pens to note down some important information .  <b>B. Printed PDF/Data Sheet</b> 1. PDF can be printed on paper and sorted. 2. Data	<b>A. PC/ Laptop/ Other computing Device:</b>  1. Computers, Mouse, Keyboards used by CASE Users for displaying, selecting, and inputting data on the CASE system. <b>B. Printer</b> 1. Printers used to print the data sheet by the Weather station data	<b>A. CASE:</b> 1. It is an web based interface which stores data and is used by the CASE users for data inputs. <b>B. Operating System</b> 1. Any Operating System used by the data sourcing team and the CASE Users like Mac, Windows, Linux. <b>C. Application Software</b> 1. Third party application software	<b>A. Database System of CASE:</b> 1. All data is uploaded into the CASE system's own database by the CASE users. <b>B. MS Excel files</b> 1. MS Excel files can be used to store the data by the data collecting team. <b>C. MySQL</b> 1. The data sourcing team can also use database system like MySQL to store the raw data. <b>D. Register Book or</b>	<b>A. Telecommunication</b> 1. Telecommunication like BTCL are used for phone calls or text messages by the weather station or the case representatives for communication for exchange of information. <b>B. Internet Connection</b> 1. Internet connection used by the case representatives for data entry to the system. <b>C. Mail</b> Mail can be exchanged between case representatives, and the admin for communication if any mishap occurs.

	<p>can change different system variables and other parameters.</p> <p>4. Look over the system continuously.</p> <p><b>C. Internal IT Expert</b></p> <p>1. Make sure the CASE system data is always protected.</p> <p>2. Make sure the website is always processing.</p> <p>3. They have to keep backup power source ready in case of power failures as well.</p> <p><b>D.External IT Expert:</b></p> <p>1.They have to provide a web server.</p> <p>2. Server providers in the CASE system for managing network resources so that the same data can be viewed by the other SREDA users as well from anywhere</p>	<p>sheets can be stored as printed versions by the case representatives.</p> <p><b>C. Cabinet</b></p> <p>1.Cabinets used to store the printed copy of data sheets Which is transferred to the case representatives for data entries.</p> <p><b>D.File Holder</b></p> <p>1. It holds the data sheets prepared by the weather stations and transfers them to the case representatives.</p> <p><b>E.Journals/Book/Newspaper/Research Papers</b></p> <p>1. Journals,Book,Newspaper,Research Papers can be</p>	<p>source team which is later transferred to the CASE Users.</p> <p><b>C. Scanner</b></p> <p>1. Scanners need to scan the data by the CASE Users if the situation appears to store the data manually.</p> <p><b>D. Servers</b></p> <p>1. Database servers used by the CASE system for CASE users for data inputs.</p> <p><b>E. Router/Internet Cables by ISP Provider s/ Switch</b></p>	<p>used by both the CASE Users and the data sourcing team like MS 365l.</p> <p><b>D. Web-based Application Software</b></p> <p>1. Web based application software to collect data from the sources. Like:Google, Wikipedia etc.</p> <p><b>E. Scanning Software</b></p> <p>1. Data can be scanned by the CASE Users if they want to store the data Manually from any printed sheet..</p> <p><b>F. Printing Software</b></p> <p>1. Printing software used for printing the data sheet</p>	<p><b>log file or Cheat Sheet:</b></p> <p>1. Register Book or log file can be used by the CASE users to note down the raw data and later keep a record of it. This is a non-computing database.</p>	
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	<p>around the world.</p> <p>3. The ISP provides internet connection to the SREDA users to do their data entry.</p>	<p>analyzed and used to make annual reports.</p>	<p>1. From networking side, internet cables by the ISP providers or router or switch used by the SREDA users.</p> <p>F. Card Reader</p> <p>1. For the data sourcing team as another medium to pass the data to the SREDA User.</p>	<p>like Printer Management or HP Print and Scan Doctor.</p> <p><b>G. PDF Viewer</b></p> <p>1. Software used to view the PDF like WPS, Cam scanner</p>		
<p><b>Data Verification &amp; Data Update</b></p>	<p><b>A. CASE Users:</b></p> <p>1. CASE User log into the case system.</p> <p>2. CASE representative views the data provided by the data collecting team of all weather stations from the</p>	<p><b>A. Phone Book</b></p> <p>1. Phone books used by the case representatives to contact people on the process of verification of data.</p> <p><b>B. Paper and</b></p>	<p><b>A. PC/ Laptop/ Other Computing Device</b></p> <p>1. The computers are used by the CASE SYSTEM users to view, verify and</p>	<p><b>A. CASE</b></p> <p>1. The CASE system used by the CASE Users to access the data provided by the data collecting team for</p>	<p><b>A. Case Database</b></p> <p>1. The CASE database, used by the CASE Users to collect the uploaded data for reviewing.</p> <p>2. The CASE database, used to</p>	<p><b>A. Internet</b></p> <p>1. The Internet is used by the case representatives to review the forms and reports submitted by the weather stations.</p> <p>2. Internet is used to update data from the weather stations for the Ministry</p>



	<p>CASE System for verification and validation input process.</p> <p>3.They note down their Source name from whom they would verify to start the validation process.</p> <p>4. They make phone calls or email for verifying the data from data sources.</p> <p>5. They update the data in the CASE system after verification.</p> <p>7. Click on the save button to store the updated data in the database.</p> <p>6.They sign and seal the manual documents to verify the weather information and send it to the upper level for further verification.</p> <p><b>B. Admin</b></p> <p>1. Log into</p>	<p><b>Stationery</b></p> <p>1. Pens used by the case representatives to sign on forms and reports to validate the information .</p> <p>2. Papers used for holding records and noting down the contacts and calculations.</p> <p><b>C. Seal stamps</b></p> <p>1. It is used to verify documents with official seals.</p> <p><b>D. PDF Version</b></p> <p>Case representatives might store the printed version of the pdf before and after the verification process as a manual backup.</p> <p><b>E. Cabinet</b></p> <p>It is used for storing the printed</p>	<p>update the data in the CASE system.</p> <p>2. Computing devices can be used by the CASE Users for searching purposes for the verification process.</p> <p>3. Data can be stored in the some another computer as a backup.</p> <p><b>B. Printer</b></p> <p>1. For printing the data sheet which has been received from the data collecting team for manual backup by CASE Users.</p> <p><b>C.Scann</b></p>	<p>reviewing.</p> <p>2.It has verified the input data.</p> <p>3. It is used to update the data if required.</p> <p><b>B.Application Software</b></p> <p>1.Application software like MS Office or any other application that were used by the CASE Users to review, validate, and update the data after the data was saved into the PC by them.</p> <p><b>C. Operating System</b></p> <p>1. Any Operating System used by the CASE Users and the Policy Makers like Mac, Windows, Linux.</p>	<p>input the validated data that was reviewed.</p> <p>3. The CASE database, used to update the data, which was already provided by the data source.</p> <p><b>B. Excel file</b></p> <p>1. Excel files used by the CASE Users to keep track of the files that have been reviewed, validated, and updated.</p> <p><b>C. MySQL</b></p> <p>1. CASE USER can store the data sheet for further research purposes in MySQL Database to avoid losing them.</p> <p><b>D. Printed Version</b></p> <p>1. Printed version of the verified data</p>	<p>of Environment and forest.</p> <p><b>B. Telecommunication</b></p> <p>1. Telecommunication methods like phone calls made by the case representatives to confirm the information and details provided by the sources.</p> <p><b>C.Mail</b></p> <p>1. Mail can be exchanged between the case representatives and the weather stations for the verification process.</p>
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	<p>the CASE system.</p> <p>2. Create new users for the system for validation and verification process from time to time.</p> <p>3. Using settings the users can change different system variables and other parameters.</p> <p>4. Keep track to make sure all the processes are running successfully.</p> <p><b>C. Internal IT Expert</b></p> <p>1. Make sure the CASE system data is always protected.</p> <p>2. Make sure the website is always processing.</p> <p>3. They have to keep backup power source ready in case of power failures as well.</p> <p><b>D. External IT Expert</b></p>	<p>version of data.</p> <p><b>F. File Holder</b></p> <p>1. For holding the printed version of the data after the verification process as a manual backup.</p>	<p><b>ers</b></p> <p>1. CASE Users might scan the data sheet to store data manually as a backup.</p> <p><b>D. Routers/ Internet Cables by ISP Providers/ Switch</b></p> <p>1. CASE users used from networking side, internet cables by the ISP providers or router or switch.</p> <p><b>E. Card Readers</b></p> <p>1. For the CASE Users if they want to use this as a medium to collect the data for research</p>	<p><b>D. Web-based Application Software</b></p> <p>1. CASE Users will use browsers to view Bangladesh ministry of environment and forestry website to log in to view, verify and update the data.</p> <p>2. For research purposes by the CASE User to verify the data.</p> <p><b>E. Scanning Software</b></p> <p>1. Data sheet can be scanned by the CASE Users if they want to store the data manually.</p> <p><b>F. Printing Software</b></p> <p>1. Printing software</p>	<p>sheet can be stored as a manual backup by the CASE Users.</p>	
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	<p>1.They have to provide a web server.</p> <p>2. Server providers in the CASE system for managing network resources so that the same data can be viewed by the other CASE users as well from anywhere around the world.</p> <p>3. The ISP provides internet connection to the CASE users to do their data entry.</p>		<p>and then to continue the verification process.</p> <p>2. CASE Users can store the data sheet after the verification process as a Backup.</p> <p><b>F. Servers</b></p> <p>1. Database servers used by the CASE system for CASE users to view data.</p>	<p>used for printing the data sheet by CASE Users as manual backup.</p> <p><b>G. PDF Viewer</b></p> <p>1. To view the data sheet in PDF version by the CASE Users.</p>		
<b>Report Generation and Analysis</b>	<p><b>A. CASE USERS</b></p> <p>1. Logs into CASE System.</p> <p>2. Selects appropriate interface to generate the report.</p> <p>3. Generates Report by clicking the make Report button, from</p>	<p><b>A. Paper and Stationery</b></p> <p>1. CASE Users or Policy Makers might need to take notes on the report.</p> <p>2.For manual verification</p>	<p><b>A. PC/ Laptop/ Other Computing Device</b></p> <p>1. CASE Users and Policy Makers will need for viewing the</p>	<p><b>A. CASE</b></p> <p>1. It is an interface which stores the data and SREDA Users generate the report based on the data.</p> <p><b>B.</b></p>	<p><b>A. CASE Database System</b></p> <p>1. To store the report into the CASE system by themselves as a record.</p> <p><b>B. MySQL</b></p> <p>1. CASE USERS or</p>	<p><b>A. Telecommunication</b></p> <p>1. Telecommunication like BTCL for phone calls or text messages by the CASE Users or Policy Makers for communication for exchange of</p>

	<p>the data stored in CASE System.</p> <p>4. Clicks the save button to store the Generated Report in the database.</p> <p>5. CASE Users store the report for analysis process led by the Policy/Decision Makers.</p> <p>6. Sends the generated report to the Policy Makers for analysis process.</p> <p>7. Receives the feedback from the Policy Makers as policy level decisions.</p> <p>8. Applies their policy level decisions to their system.</p> <p><b>B. Policy Makers</b></p> <p>1. Log in to CASE system</p> <p>2. Receives the generated report from CASE Users.</p> <p>3. Clicks</p>	<p>and calculation pen and papers are used.</p> <p><b>B. PDF Version</b></p> <p>1. CASE Users will store a PDF version of the report.</p> <p>2. Policy Makers receive PDF version of the report from CASE Users.</p> <p><b>C. Printed Version</b></p> <p>1. CASE Users or Policy Makers might want to store the report as printed version.</p> <p><b>D. Cabinet</b></p> <p>1. For storing the report which was printed as manual backup by the CASE Users or the Policy Makers.</p> <p><b>E. File</b></p>	<p>report.</p> <p>2. Report can be stored inside the computing device.</p> <p>3. Can be used for searching for research purposes.</p> <p><b>B. Printer</b></p> <p>1. For printing the report for manual backup Or evaluation sheet by CASE Users or Policy Makers.</p> <p><b>C. Scanner</b></p> <p>1. To scan the report by CASE Users or Policy Makers to store data manually.</p> <p><b>D. Routers/ Internet Cables by ISP</b></p>	<p><b>Operating System</b></p> <p>1. Any Operating System used by the CASE Users and the Policy Makers like Mac, Windows, Linux.</p> <p><b>C. Application Software</b></p> <p>1. Policy Makers can view the report received from the CASE Users.</p> <p><b>D. Web-based Application Software</b></p> <p>1. CASE Users will use browsers to view CASE website to log in to fetch data and generate the report.</p> <p>Policy Makers will use browsers</p>	<p>Policy Makers can store the reports for further research purposes in MySQL Database to avoid losing them.</p> <p><b>C. Printed Version</b></p> <p>1. Printed version of report can be stored as a manual backup by the Policy Makers and the CASE Users.</p>	<p>information or if any mishap occurs.</p> <p><b>B. Internet Connection</b></p> <p>1. Internet connection used by the CASE Users and Policy Makers for generating viewing the report.</p> <p><b>C. Mail</b></p> <p>1. Mails can be exchanged between the CASE Users and the Policy Makers for communication if any mishap occurs.</p>
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	<p>download button to store the report.</p> <p>4. Analyzes the generated report received from CASE Users for strategical decision making in future and take policy level decisions.</p> <p>5. Makes decision for the future betterment of the company.</p> <p>6. Let's the CASE Users know about their feedback as policy level decisions.</p> <p><b>C. Admin</b></p> <p>1. Logs into the CASE system.</p> <p>2. Create new users for the system to receive the generated report from from time to time.</p> <p>3. Using setting the users can change different system</p>	<p><b>Holder</b></p> <p>1. For holding the printed version of the report stored by CASE Users or Policy Makers.</p> <p><b>F. Book/ Journals/ Newspapers/Research Papers</b></p> <p>1. Policy Makers might do some research to analyze the report properly and take proper policy level decisions.</p>	<p><b>Providers/ Switch</b></p> <p>1. From networking side, internet cables by the ISP providers or router or switch used by the CASE Users.</p> <p><b>E. Card Reader</b></p> <p>1. For the CASE Users and Policy Makers if they want to use this as a medium to transmit the report or store.</p> <p><b>F. Server</b></p> <p>1. Database servers used by the CASE system for CASE users</p>	<p>to login and receive the report from the CASE Users.</p> <p>2. For research purposes to ensure proposing the best and beneficial policies.</p> <p><b>E. Scanning Software</b></p> <p>1. Report can be scanned by the CASE Users or Policy Makers if they want to store the data manually. Or if the CASE Users want to send a manual copy of report to the Policy Makers.</p> <p><b>F. Printing Software</b></p> <p>1. Printing software used for printing</p>		
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	<p>variables and other parameters.</p> <p>4. Keeps track to make sure all the processes are running successfully.</p> <p><b>D. Internal IT Expert</b></p> <p>1. The CASE system is maintained by some IT experts whose job is to make sure the data is always protected.</p> <p>2. They must make sure the website is always running.</p> <p>3. They have a backup ready in case of power failures as well.</p> <p><b>E. External IT Expert</b></p> <p>1. Server providers in the CASE system for managing network resources so that the data can be viewed, and report can be generated by</p>		to view data.	<p>report as a manual backup.</p> <p><b>G. PDF Viewer</b></p> <p>1. To view the report in PDF version by the CASE Users and Policy Makers.</p>		
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	<p>the other CASE users from CASE system.</p> <p>2. The internet service providers provide internet connection to the CASE users to generated report from CASE and to the Policy Makers to view the report and do their own research.</p>					
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# PROCESS DIAGRAM

## AS-IS

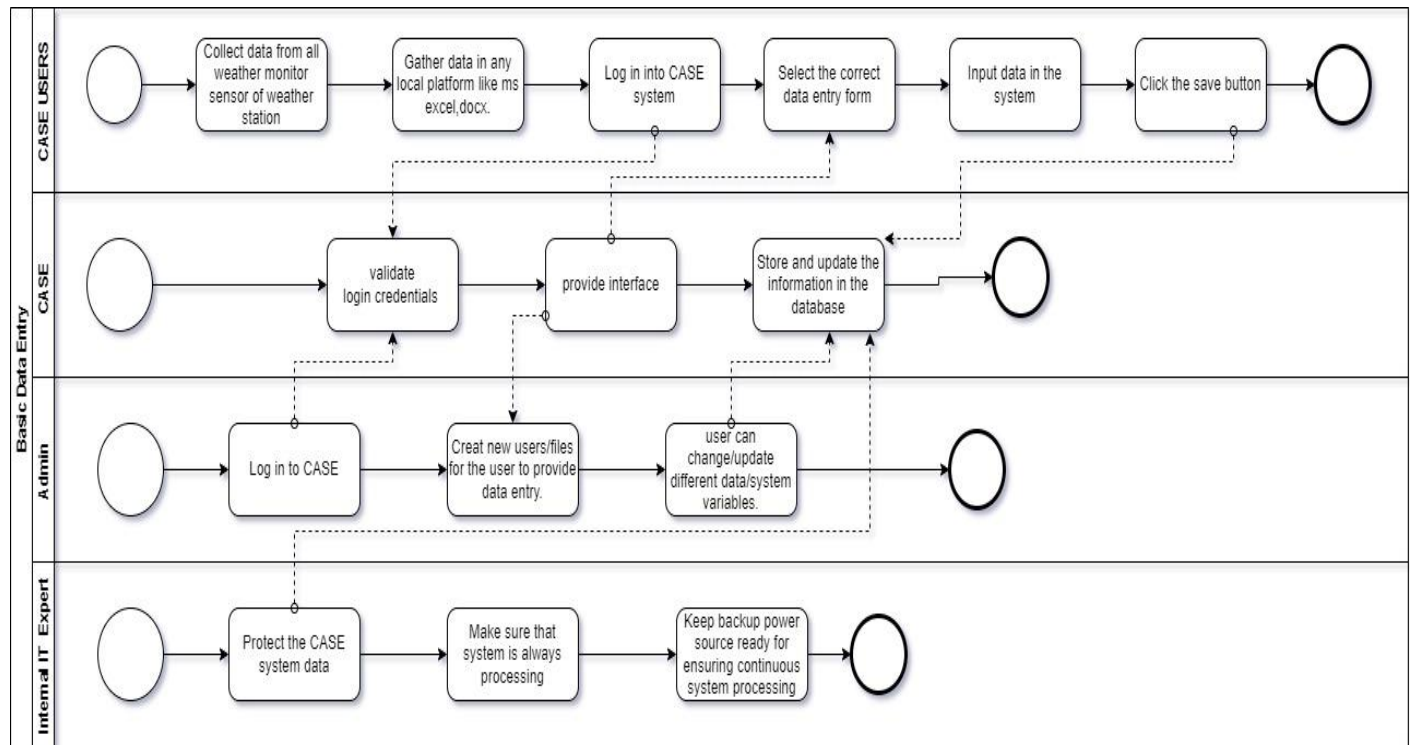


Figure : As-Is process diagram for basic data entry.



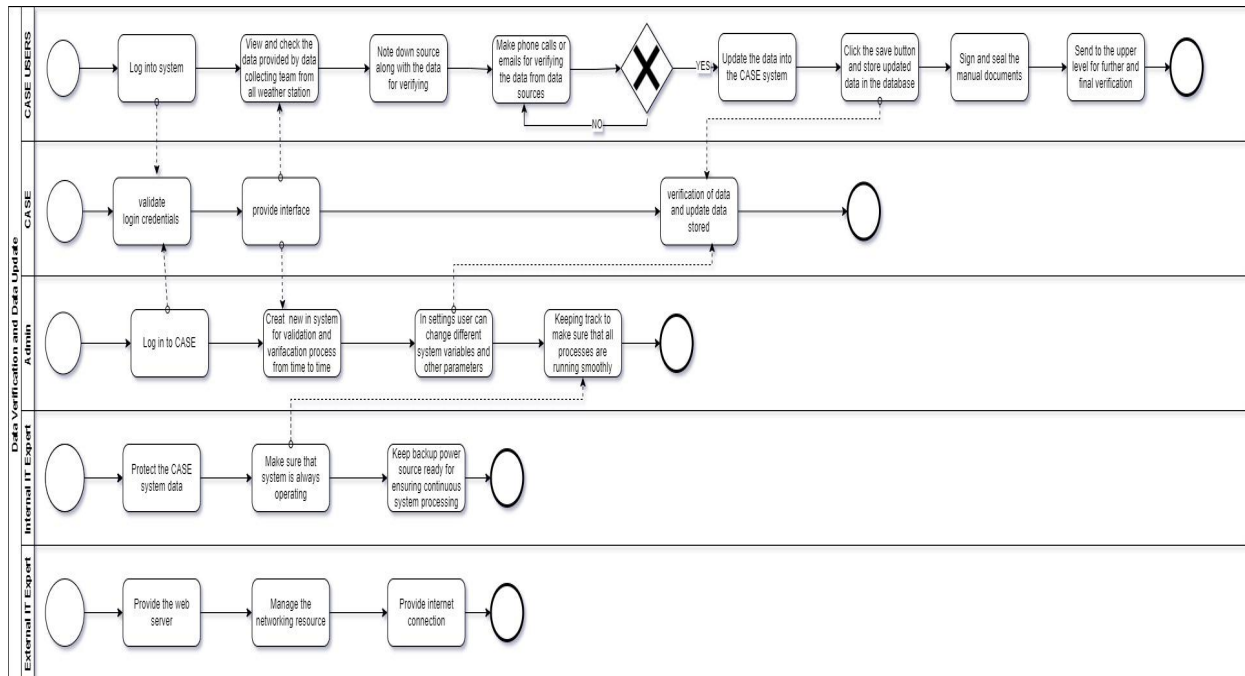


Figure : As-Is process diagram for data verification data update

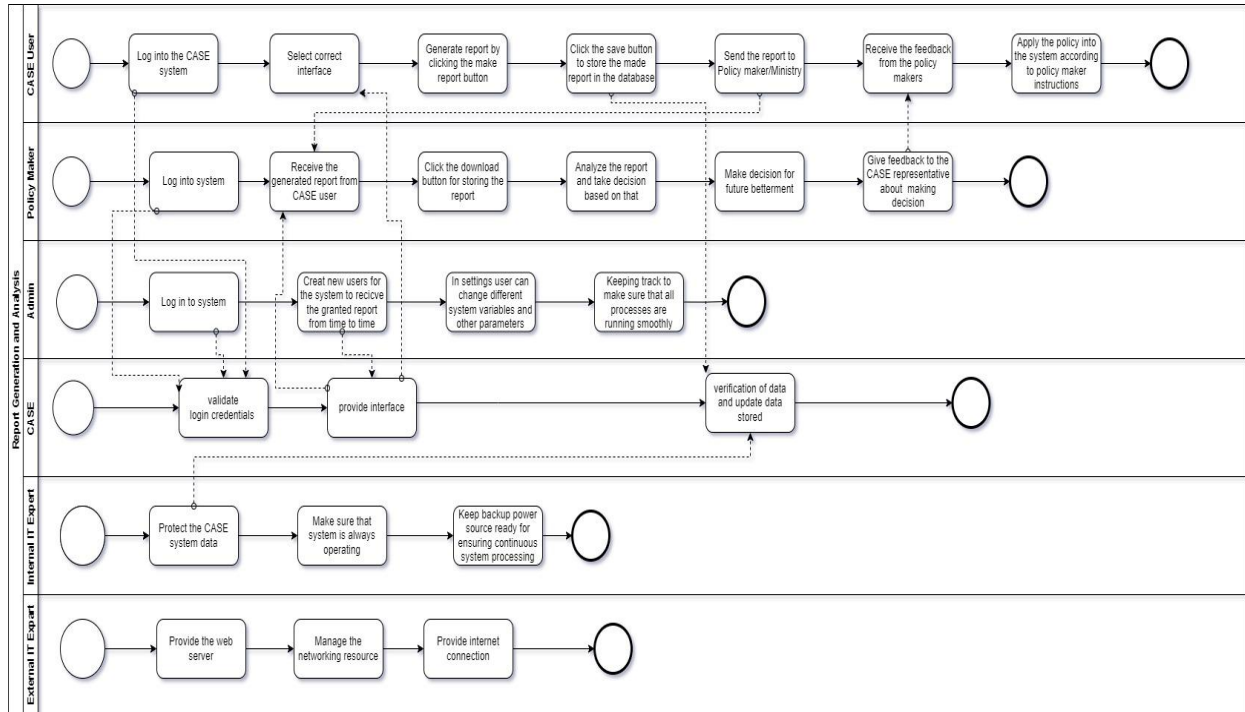


Figure: As-Is Process diagram for report generation and analysis

## Problem Analysis:

Process Name	Stakeholders	Problems	Analysis(Reason of the problem)	Proposed Solution
Basic Data entry	1. CASE Users 2. Data providers from the data sources(weather stations)	1. The data that is required to gather, takes a longer period of time to collect. 2. Human error	1. Here many users are getting involved in updating the data which is delaying the process. The data provider does not get the scope to input data in the system and they have to send the data to CASE users. 2. In order to update or change the data, the case user needs to ask for data from the data provider repeatedly, which is also delaying the process. 3. Since the data will be inserted by humans they might end up making mistakes in updating the data. Ex. unitary mistake or numerical mistake.	1. To solve the problem of delaying data input, we can allow the data provider directly to input data for which the system has to be redesigned. 2. The CASE user will update the data according to the raw data which is provided by the stakeholders instead of asking the stakeholders repeatedly. 3. System automatically checks some of the human errors. Such as Wrong units, Unmatched data types, etc.
Verification, Validation, and Update Data	1. CASE Users.	1. Inspect manually. 2. Quantification of various units. 3. No verification and validation of the data obtained from the Bangladesh Meteorological Department.	1. The operation time increases since all the data requires to be inspected manually. 2. The quantification of the units of all data are not the same which results in lack of certainty. For this uncertainty the conversion of units(to	1. Add a feature in the system which will automatically check the inputted data in the CASE system which eliminates the manual checking by the CASE users. 2. System will automatically convert the units

			<p>a standard form) may cause some uncertainty since it is done manually.</p> <p>3. The provider data from the Bangladesh Meteorological Department can have some faults.</p>	into a standard form.
Report Generation and Analysis	<p>1. CASE Users.</p> <p>2. Policy Makers.</p> <p>3. Data providers from the data sources(weather stations)</p> <p>4. Sub-Project owner</p>	<p>1. The AQMS user does not have any way to generate report of the data provided by the NGO</p> <p>2. The data history is not recorded or kept.</p> <p>3. The accuracy of the data is not tested properly for authentication.</p> <p>4. Analysis through anticipation did not take place here.</p>	<p>1. The data provider will not get the data they have uploaded and this might end up discouraging the data-provider like NGO or weather station.</p> <p>2. The report needs to be gathered to keep the history.</p> <p>3. The record of the data may be required for research purposes which needs to be gathered.</p> <p>4. The anticipation will help the ministry to take precaution and make decisions before a natural disaster takes place.</p>	<p>1. To create reports for the provider and AQMS user, construct the report generation module again accordingly in such a way so that the report module can be altered according to the command of the ministry.</p> <p>2. To store the history of the past data, create a function that will store the old data accordingly on its own. This will help later for research and analyzing data.</p>

# RICH PICTURE

TO-BE

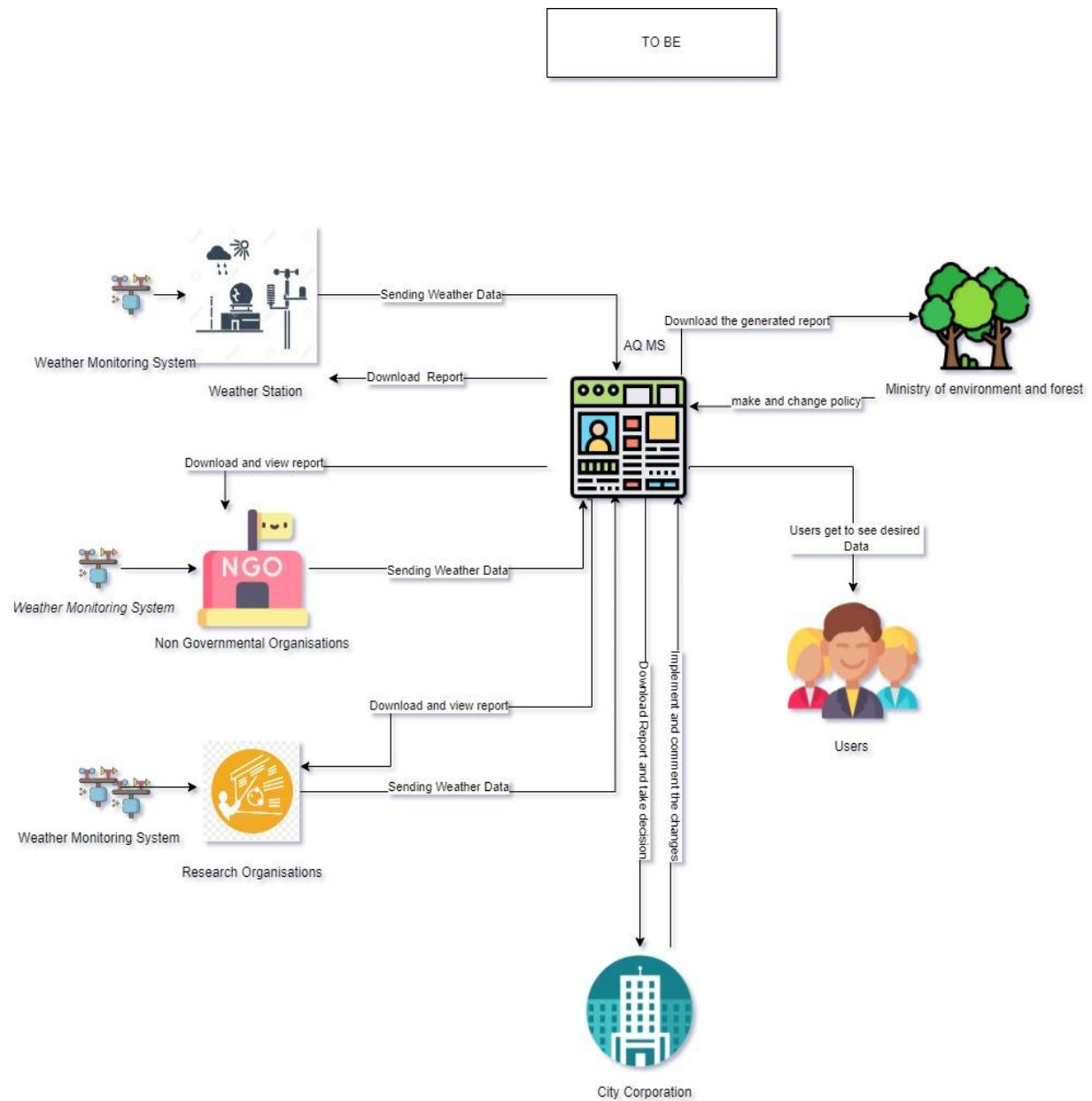


Figure: To-Be Rich picture

# SIX ELEMENT ANALYSIS

## TO-BE

Process	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Communication & Network
<b>Data entry</b>	<b>A. Weather Station representative (works as a data provider):</b> 1. Firstly log in to the AQMS system. 2. Go to the data entry form for inputting data. 3. Then input the station wise data which is collected from the weather monitoring sensor. 4. If the weather data is stored in the CSV file, then the station will upload the CSV file to the AQMS system. 5. Then save the data. 6. After then data will	<b>A. Paper and stationary</b> 1. Paper is utilized in information sourcing group to provide the manually enter data users of AQMS. 2. AQMS Users can print the data and keep a manual database. 3. The personnel gathering the raw data used stationary to update the data sheet.  <b>B. Data Sheet in Printed Version</b> 1. The data sheet can be	<b>A. PC/Laptop/Other computing device</b> 1. Data producers and AQMS users use computers, mouse, and keyboards to display, choose, and enter data on the AQMS system.  <b>B. Scanner</b> 1. Scanners for AQMS data scanning If users want to manually store the	<b>A. AQMS</b> 1. Verify the user first. 2. It offers an interface for data entry for both AQMS users and data suppliers. 3. The AQMS system data entry modules allow AQMS users and data providers from data sources like the Bangladesh Ministry of Environment and Forestry to directly enter their own data and produce	<b>A. Database System of AQMS</b> 1. Accumulation of updated data is transferred into AQMS by the Weather monitoring system (E.g. Weather station)  <b>B. MS Excel files</b> 1. AQMS user is updating data with the help of MS Excel files.  <b>C. MySQL</b> 1. In order to store the raw data, database systems like MySQL can be used by the AQMS	<b>A. Telecommunication</b> 1. In case of any emergency for the weather monitoring system or city corporation or AQMS user or the ministry to communicate, telecommunication like BTCL calls or text can be used.  <b>B. Internet Connection</b> 1. In order to send data of weather monitoring systems from different sources to the AQMS Internet connections have been used.  <b>C. Mail</b> 1. For any update or change or comment, mails can be used to communicate

	<p>automatically save in the AQMS system database.</p> <p><b>B. Research Organization:</b></p> <ol style="list-style-type: none"> <li>1. Log in to the AQMS system.</li> <li>2. Select the correct data entry form for entering station wise data.</li> <li>3. Fill up the data entry form and save it.</li> <li>4. Select the correct data entry form for entering root wise data.</li> <li>5. Fill up that data entry form and save it.</li> <li>6. If the weather data is stored in the CSV file, then the station will upload the CSV file to the AQMS system and the file's data automatically go to the AQMS system.</li> </ol> <p><b>C. NGO:</b></p> <ol style="list-style-type: none"> <li>1. Log in to the AQMS</li> </ol>	<p>collected as a printed version, by the AQMS users.</p> <p><b>C. Cabinets</b></p> <ol style="list-style-type: none"> <li>1. Cabinets for storing Register Books or Data Sheets that the Data Sourcing Team had created before transferring them to the AQMS Users for data entry.</li> </ol> <p><b>D. File Holder</b></p> <ol style="list-style-type: none"> <li>1. To send the data sheet created by the data sourcing team to the AQMS Users for data entry while it is in their possession.</li> </ol> <p><b>E. Journals/ Research Papers/ Books/ Newspaper</b></p>	<p>data.</p> <p><b>C. Servers</b></p> <ol style="list-style-type: none"> <li>1. The AQMS system's data providers and AQMS users' data entries are stored on database servers.</li> </ol> <p><b>D. Router/ Internet Cables by ISP Providers/ Switch</b></p> <ol style="list-style-type: none"> <li>1. In terms of networking, internet cables provided by ISPs or switches or routers used by data providers and AQMS users.</li> </ol> <p><b>E. Card Reader</b></p> <ol style="list-style-type: none"> <li>1. For the data</li> </ol>	<p>reports for their own needs and then store the data in the database.</p> <p><b>B. Operating System</b></p> <ol style="list-style-type: none"> <li>1. Any operating system, including Mac, Windows, and Linux, utilized by the data suppliers, data sourcing team, and AQMS users.</li> </ol> <p><b>C. Application Software</b></p> <ol style="list-style-type: none"> <li>1. Application software, such as MS Excel, is used by the data suppliers, AQMS users, and the data sourcing team.</li> </ol> <p><b>D. Web-based Application Software</b></p>	<p>user.</p> <p><b>D. Register Book or log file</b></p> <ol style="list-style-type: none"> <li>1. A non-computing database can be used by the AQMS user to note and keep record of the raw data. For example, register books or log files.</li> </ol>	<p>with the AQMS user by the "Ministry of environment and forest" or "City Corporation".</p>
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	<p>system.</p> <p>2. Select the correct data entry form for entering station wise data.</p> <p>3. Fill up the data entry form and save it.</p> <p>4. Select the correct data entry form for entering root wise data.</p> <p>5. Fill up that data entry form and save it.</p> <p>6. If the weather data is stored in the CSV file, then the station will upload the CSV file to the AQMS system and the file's data automatically go to the AQMS system.</p> <p><b>C. Admin</b></p> <p>1. To have access in the system first we need to and sign in to the AQMS system.</p> <p>2. In order to input or update data,</p>	<p><b>ers</b></p> <p>Journals, Research papers, books, newspapers through which the Country's Energy Consumption and annual GDP data can be analyzed and can be used for the annual reports.</p>	<p>sourcing team to use as an additional means of data transmission to the AQMS User.</p>	<p>1. Software for web-based applications to get data from sources</p> <p><b>E. Scanning Software</b></p> <p>1. If AQMS Users want to manually store the data, they can scan the data.</p> <p><b>F. Printing Software</b></p> <p>1. Printing software such as Printer Management or HP Produce and Scan Doctor that is used to print the data sheet</p> <p><b>G. PDF Viewer</b></p> <p>1. Software used to view the PDF like WPS.</p>		
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	<p>generate new users for the system.</p> <p>3. Many changes in the system such as variables and other parameters can be changed using settings.</p> <p>4. To ensure, keep surveying by invigilating the system.</p> <p><b>D.Internal IT Specialist</b></p> <p>1. To ensure the safety of the data, IT experts are required who help to protect the AQMS system.</p> <p>2. Making sure that the website is always running is also their job.</p> <p>3. By any chance if the power fails, in order to recover they have backup as well.</p> <p><b>E. Outside IT Expert</b></p> <p>1. Server</p>					
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	<p>companies on the AQMS network for directing network assets hence, the same One can view the data. by each and every user likewise from any location the globe. Internet</p> <p>2. The AQMS user uses the internet to upload the data which is provided by the internet service provider.</p>					
<b>Data Verification &amp; Data Update</b>	<p><b>A. AQMS User:</b></p> <p>1. The user of AQMS logs into AQMS.</p> <p>2 The AQMS System's user views the data provided by data sources such as weather stations,NGO and research organization in order to</p>	<p><b>A. Paper and Stationery</b></p> <p>1. The AQMS Users signed forms and reports with pens to manually verify the information as backup.</p> <p><b>B. Seal stamps</b></p> <p>Seal</p>	<p><b>A. PC/ Laptop/ Other Computing Device</b></p> <p>1. AQMS Users utilize computers to see and save confirmed data in the AQMS system.</p> <p>2. The computer</p>	<p><b>A. AQMS</b></p> <p>1. Before allowing the AQMS user access, the AQMS system verifies the user.</p> <p>2. Automatically check the data by system error checking feature which is emphasize</p>	<p><b>A. AQMS Database</b></p> <p>1. The collection of weather data is updated to the AQMS system by the Weather monitoring system(WMS)</p> <p>2. The weather data is stored by</p>	<p><b>A. Internet</b></p> <p>1.Data is used to survey the form and reports submitted by the weather monitoring system to the AQMS user.</p> <p>2.To save the data to AQMS that is already updated and verified, the use of the internet is mandatory.</p>

	<p>verify, validate, and update the data.</p> <p>3. The AQMS user verifies the accuracy of the AQMS system.</p> <p>4. AQMS User determines weather the AQMS system build in feature has validated the data provided by the data sources or not.</p> <p>5. And check the data again if the data has any error then correct that and update the data in the database.</p> <p><b>B. Admin</b></p> <p>1. The administrator logs into the AQMS system.</p> <p>2. Create new users for the system so that it may periodically do validation, verification, and updates.</p> <p>3. The user</p>	<p>stamps were used to verify the documents with official seals as manual backup.</p> <p><b>C. PDF Version</b></p> <p>1. AQMS Users may choose to do a manual backup by storing a copy of the before and after data after the verification process has been completed.</p> <p><b>D. Printed Version</b></p> <p>1. To store the printed form of the data once the manual procedure of verification is complete.</p> <p><b>E. Cabinet</b></p> <p>1. for manually backing up the printed version of the data</p>	<p>can be used to save data as a backup.</p> <p><b>B. Printer</b></p> <p>1. To produce the data sheet for AQMS users to manually backup.</p> <p><b>C. Scanners</b></p> <p>1. AQMS Users may scan the data sheet and manually enter data as a backup.</p> <p><b>D. Routers/ Internet Cables by ISP Providers/ Switch</b></p> <p>1. Internet cables provided by ISPs or switches or routers used by</p>	<p>d on unit,standa rd etc. and verify the data.</p> <p>3. The AQMS system Updates the data that has been stored in the AQMS database from the data sources.</p> <p>4. The AQMS allow the users and data providers to access the data provided by data sources for the purposes of updating, validating, and verifying it.</p> <p>5. The AQMS system contains a built-in module that verifies the accuracy of the data inputted from the data sources.</p>	<p>the Weather Monitoring System(WMS) to the AQMS database system. These data are being analyzed to the and made report which is verified by "Bangladesh Material Department (BMD)".</p> <p>3. The stored data is updated by the "City Corporation" and "Ministry of Environment and Forest" to the AQMS database system. These data are being analyzed to the and made report after getting verified by "Bangladesh Material Department (BMD)".</p> <p>4.Data providers and AQMS</p>	
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	<p>can modify several system variables and other parameters via settings.</p> <p>4. Monitor the processes to ensure that they are all successfully operating.</p> <p><b>C. Data Providers</b></p> <p>1. Logs into a data provider AQMS system.</p> <p>2. Input the data in the system.</p> <p>3. Sources can view the previously provided data.</p> <p>4. If any error detects, make it correct and update data and database.</p> <p><b>D. Internal IT Expert</b></p> <p>1. Some IT professionals who work to ensure that the data is always safeguarded manage the AQMS system.</p> <p>2. They must guarantee</p>	<p>following the verification procedure.</p> <p><b>F. File Holder</b></p> <p>1. To store the printed version of the data as a manual backup after the verification process.</p>	<p>AQMS users on the networking side.</p> <p><b>E. Card Readers</b></p> <p>1. After the verification procedure, AQMS Users can keep the data sheet as a backup.</p> <p><b>F. Servers</b></p> <p>1. AQMS system database servers are used by AQMS users to see data.</p>	<p><b>B. Application Software</b></p> <p>1. The AQMS Users used application software, such as MS Office or any other application, to view the data that the AQMS system had verified.</p> <p><b>C. Operating System</b></p> <p>1. Any operating system, including Mac, Windows, and Linux, utilized by AQMS users and policy makers.</p> <p><b>D. Web-based Application Software</b></p> <p>1. AQMS Users will view using browsers the AQMS webpage register to see</p>	<p>users accessed the uploaded data that had been examined by the AQMS system for the users in the AQMS database.</p> <p>5. The data was verified and stored in the AQMS database by the AQMS user to keep the record on the system.</p> <p><b>B. Excel file</b></p> <p>1. AQMS users utilize Excel files to maintain track of the files that have gone through verification and update procedure.</p> <p><b>C. MySQL</b></p> <p>1. To prevent losing the data, the AQMS</p>	
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	<p>that the website is constantly operational. 3. They also have a backup plan in place in case of power outages.</p> <p><b>E. External IT Expert</b> 1. Server providers for the AQMS system, which control network resources and allow other AQMS to see and update the validated data. users from the AQMS system. 2. The internet Service providers give AQMS users access to the internet so they can read and save updated data that has been validated by the AQMS system.</p>			<p>and keep the confirmed and new information on a AQMS system.</p> <p><b>E. Scanning Software</b> 1. If AQMS Users want to manually store the data, they can scan the data sheet.</p> <p><b>F. Printing Software</b> 1. Printing program used by AQMS Users to print the data sheet as a manual backup.</p> <p><b>G. PDF Viewer</b> 1. To view the data sheet in the AQMS Users' PDF edition.</p>	<p>USER can download the report in MySQL Database for future research if needed.</p> <p><b>D. Printed Version</b> 1. The AQMS Users may manually keep a backup copy as a printed version of the checked data sheet.</p>	
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<b>Report Generation &amp; Analysis</b>	<p><b>A. Weather Station(Works as Data providers)</b> 1. Logs into AQMS System 2. Clicks on the Save Report Button.</p> <p><b>B. Research Organization:</b> 1. Logs into AQMS System 2. Clicks on the Save Report Button.</p> <p><b>C.NGO:</b> 1. Logs into AQMS System 2. Clicks on the Save Report Button.</p> <p><b>D.AQMS USERS</b> 1. Logs into AQMS System. 2. Selects the inbuilt report template in report generation module. 3. Modifies it according to the Policy Makers' preferences. 4. Create a template for generating</p>	<p><b>A. Paper and Stationery</b> 1.It may also be necessary for AQMS users or policymakers to make notes on the report. 2.Pen and paper are used for manual calculation and verification . 3. For use in printing.</p> <p><b>B. PDF Version</b> 1.Data Providers look at the report and keep a record of it for the benefit of their business. 2. AQMS users send a PDF version of the report to policy makers.</p> <p><b>C. Printed Version</b> 1. The report may be stored in printed</p>	<p><b>A. PC/ Laptop/ Other Computing Device</b> 1.AQMS Users examine and modify the report production module in accordance with the demands of the policy maker. They produce the report later and submit it to the data providers and policy makers. 2. To view the report, policymakers and data providers are required. 3. Reports may be saved inside the</p>	<p><b>A. AQMS System</b> 1. It provides an interface which stores the data and AQMS Users generate the report based on the data.</p> <p><b>B. Operating System</b> 1. Any Operating System used by the AQMS Users, Policy Makers and Data Providers like Mac, Windows, Linux.</p> <p><b>C. Application Software</b> 1. Policy Makers and Data Providers can view the report received from the AQMS Users.</p>	<p><b>A. AQMS database System</b> 1. The AQMS database system is used to store the weather data.</p> <p><b>B. MySQL</b> 1. Even though only research organizations need to download and view reports for research purposes, but other weather monitoring systems and city corporation can also have the flexibility to download and view reports in MySQL. This is to keep a backup from losing weather data or reports.</p> <p><b>C. Printed Version</b> 1. To have backup data,</p>	<p><b>A. Telecommunication</b> 1. In case of any emergency for the weather monitoring system or city corporation or AQ MS user or the ministry to communicate, telecommunication like BTCL calls or text can be used.</p> <p><b>B. Internet Connections</b> 1. The weather monitoring system, city corporation and AQMS user used internet connection to update or survey reports.</p> <p><b>C. Mail</b> 1. For any update or change or emergency, mails can be used to communicate among "Data Providers" (from weather monitoring system) by the "Ministry of environment and forest" or "City Corporation".</p>
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	<p>graph into the reports which can be used for predictive analysis for the future and help the policy makers make strategic decisions.</p> <p>5. Adds the previously stored reports with the current report to let the Policy Makers know about the previous state for fair policy level decisions.</p> <p>6. Generates Report by clicking the Generate Report button.</p> <p>7. Clicks the save button to store the Generated Report.</p> <p>8. AQMS Users store the report - for analysis process led by the Policy</p>	<p>form by policymakers or data providers.</p> <p>2. If AQMS users want to manually distribute a copy of the report to the decision-makers and data providers.</p> <p><b>D. Cabinet</b></p> <p>1. used to save reports that data providers or policy makers manually produced as backups.</p> <p>2. In the event that AQMS users also desire to manually provide a copy of the report to the decision-makers and data providers.</p> <p><b>E. File Holder</b></p> <p>1. For storing the</p>	<p>computer by data providers and policy makers.</p> <p>4. Suitable for research-related search objectives.</p> <p><b>B. Printer</b></p> <p>1. To print the report for manual backup or as an evaluation sheet for data providers or policy makers.</p> <p>2. If AQMS users want to manually deliver a copy of the report to decision-makers and data providers</p> <p><b>C. Scanner</b></p> <p>1. To manually store data, data providers</p>	<p><b>D. Web-based Application Software</b></p> <p>1. <b>AQMS</b></p> <p>Users will use browsers to view AQMS System website to log in to fetch data and generate the report.</p> <p>Policy Makers and Data Providers will use browsers to login and receive the report from the AQMS Users.</p> <p>2. For research purposes to ensure proposing the best and beneficial policies by the Policy Makers.</p> <p><b>E.</b></p>	<p>manually printed reports can be kept by the weather monitoring system(WMS) and "City Corporation".</p>	
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	<p>Makers.</p> <p>9. Receives the feedback from the Policy Makers as policy level decisions.</p> <p>10. Applies their policy level decisions to their system.</p> <p><b>E. Policy Makers(Ministry and City Corporation ):</b></p> <p>1. Download the generated report from AQMS Users.</p> <p>2. Clicks save button to store the report.</p> <p>3. Analyzes the generated report received from AQMS Users for strategic decision making in future and take policy level decisions.</p> <p>4. Makes strategic decision</p>	<p>printed copy of the report that data providers or policy makers have saved.</p> <p>2. If AQMS users want to manually deliver a copy of the report to decision-makers and data providers.</p>	<p>or policy makers must scan the report.</p> <p>2. If AQMS users want to manually send a copy of the report to the decision-makers and data provider.</p> <p><b>D. Routers/ Internet Cables by ISP Provider s/ Switch</b></p> <p>1. Internet cables provided by ISPs or switches or routers used by AQMS users on the networking side.</p> <p><b>E. Card Reader</b></p> <p>1. For the Data Providers and</p>	<p><b>Scanning Software</b></p> <p>1. Report can be scanned by the Data Providers or Policy Makers if they want to store the data manually. Or if the AQMS Users also want to send a manual copy of report to the Policy Makers and Data Providers.</p> <p><b>F. Printing Software</b></p> <p>1. Printing software used for printing report as a manual backup by the Policy Makers and Data Providers.</p> <p>2. If the AQMS Users also want to send a manual copy of</p>		
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	<p>for the future betterment of the company.</p> <p>5. Let's the AQMS Users know about their feedback as policy level decisions.</p> <p><b>F. Admin</b></p> <p>1. Create new users for the system to receive the generated report from time to time.</p> <p>2. Using setting the users can change different system variables and other parameters.</p> <p>3. Keeps track to make sure all the processes are running successfully.</p> <p><b>G. Internal IT Technicians</b></p> <p>1. The AQMS system is maintained by some IT experts whose job is</p>		<p>Policy Makers, should they choose to use this as a means of transmitting or storing the report.</p> <p><b>F.Server</b></p> <p>1. Database servers that the AQMS system uses to store data for AQMS users to see, generate reports from, and transmit to policymakers and data providers</p>	<p>report to the Policy Makers and Data Providers.</p> <p><b>G. PDF Viewer</b></p> <p>1. To view the report in PDF version by the Data Providers and Policy Makers.</p> <p>2. If the AQMS Users also want to send a manual copy of report to the Policy Makers and Data Providers.</p>		
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	<p>to make sure the data is always protected.</p> <p>2. They have to make sure the website is always running.</p> <p>3. They build the report templates in the report generation module which can be changed by the data providers and the AQMS users as per the requirements of the policy makers.</p> <p>4. Incorporates a automatic graph provider system which will automatically provide graph into the reports which can be used for predictive analysis for the future and</p>					
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	<p>help the policy makers make strategic decisions.</p> <p>5. They builds an in-built function which will automatically store the previous generated reports in the AQMS system, which can be used with the</p> <p>6. Contacts with the admin if needed to solve any mishaps.</p> <p>7. They have a backup ready in case of power failures as well.</p> <p><b>H. External IT Expert</b></p> <p>1. Server providers in the AQMS system for managing network resources so that the data can be viewed and</p>					
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	<p>report can be generated by the other AQMS users</p> <p>From the AQMS system.</p> <p>2. The internet service providers provides internet connection to the AQMS users to generated report from AQMS and to the Policy Makers to view the report and do their own research.</p>					
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# PROCESS DIAGRAM

## TO-BE

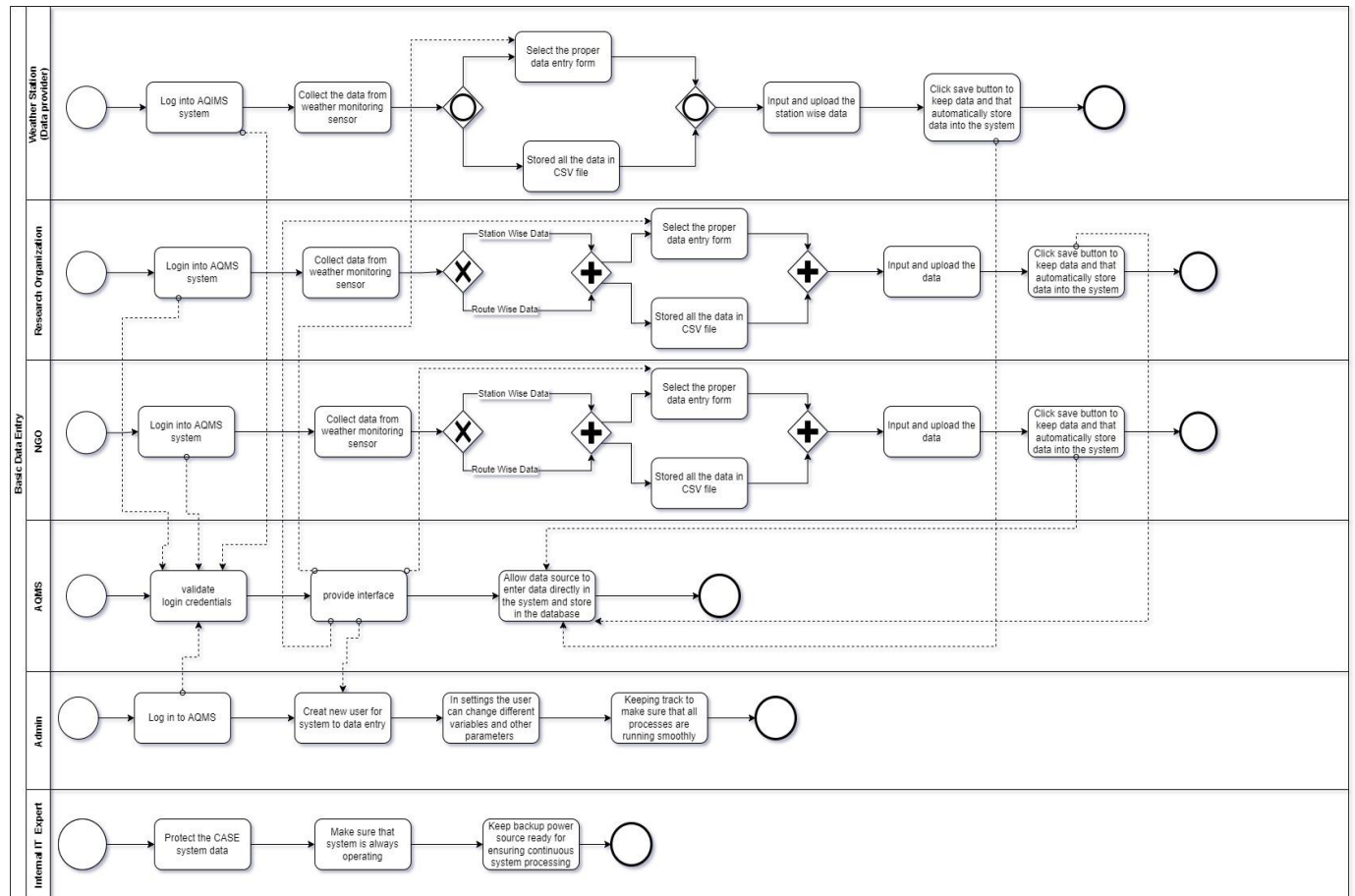


Figure : To-be process diagram for basic data entry

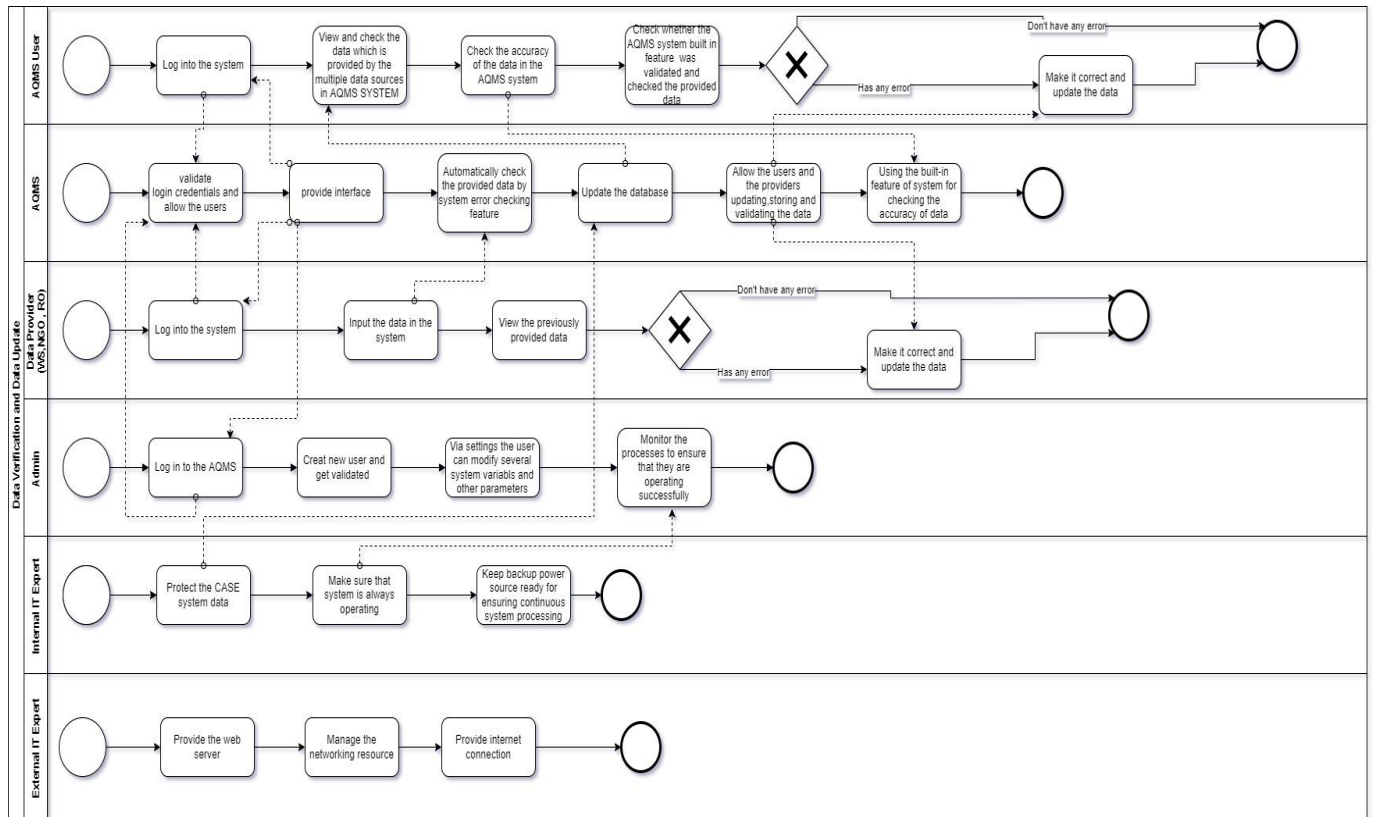


Figure : To-be process diagram for Data verification and update

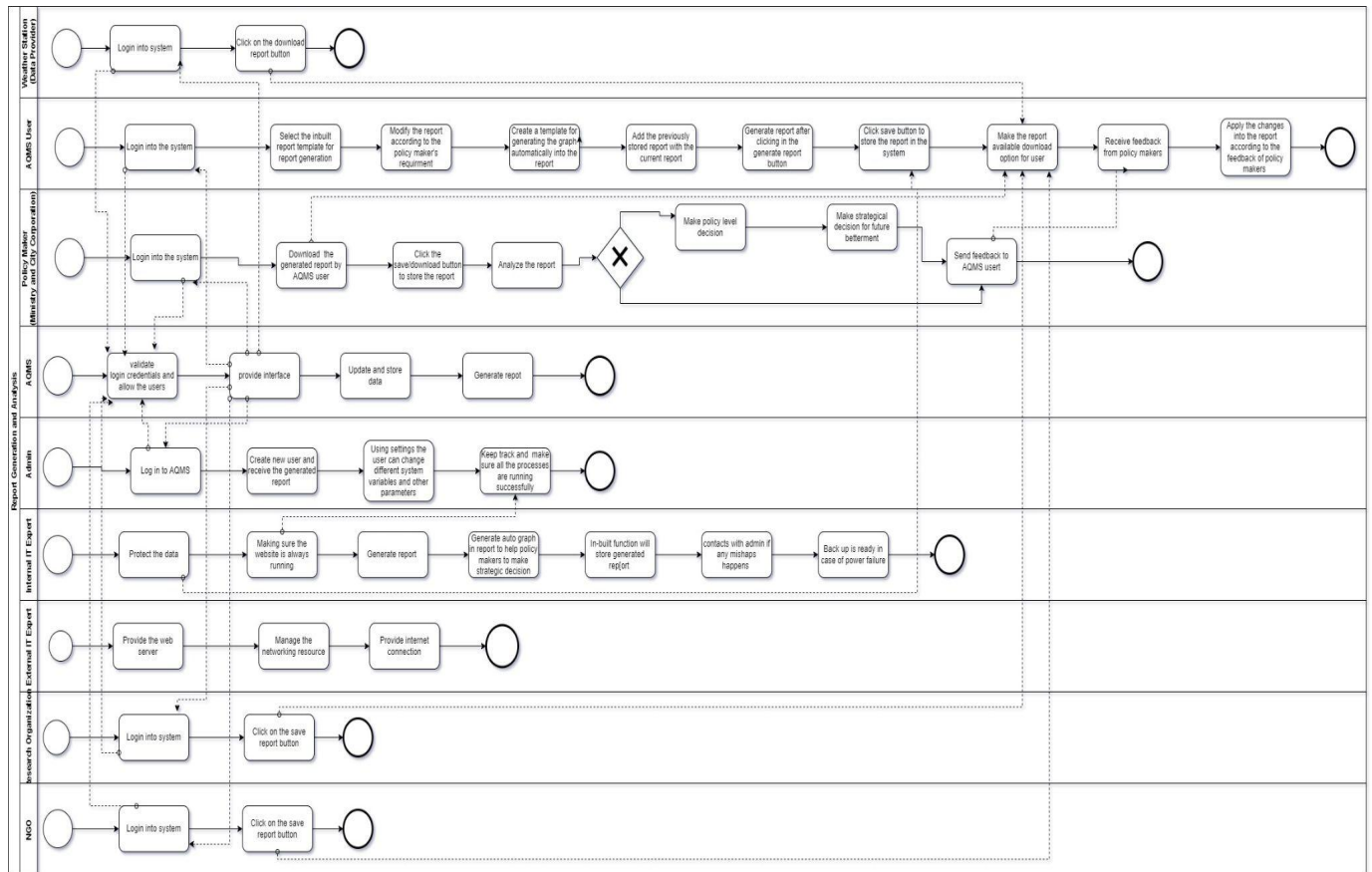


Figure : To-be process diagram for Report generation and analysis

## Entity Relationship Diagram

**BUSINESS RULE:**

Business rules describe the operations, definitions and constraints that govern the data model. As opposed to the ERD, they are made using regular English sentences so that a non-technical stakeholder can decipher information about the data model without notation knowledge. The business rules that govern our data model are as follows:

Weather station has station id. Weather stations are categorized by govt station and private station. A station can not be a govt. and private at a time. Govt station has division name and private station has metro name. Govt. station will give multiple station data. Station data has id, pm 2.5, average temperature, rain precipitation, wind speed, visibility, relative humidity and date. Private station can give multiples station data and route data both. Route data has id, longitude, latitude, mean and date. Every station must to under an organization. Organization has organization name.

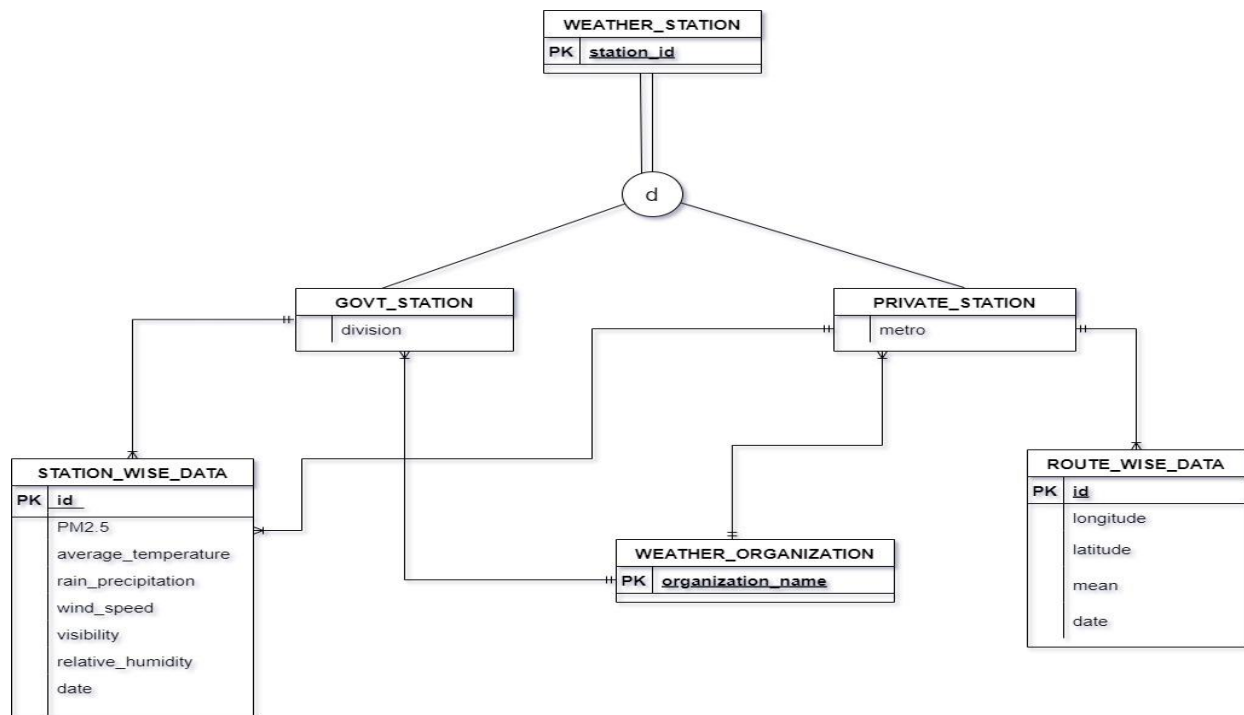


Figure : To-be ERD for AQMS user



# ENTITY RELATION DIAGRAM TO RELATION SCHEMA

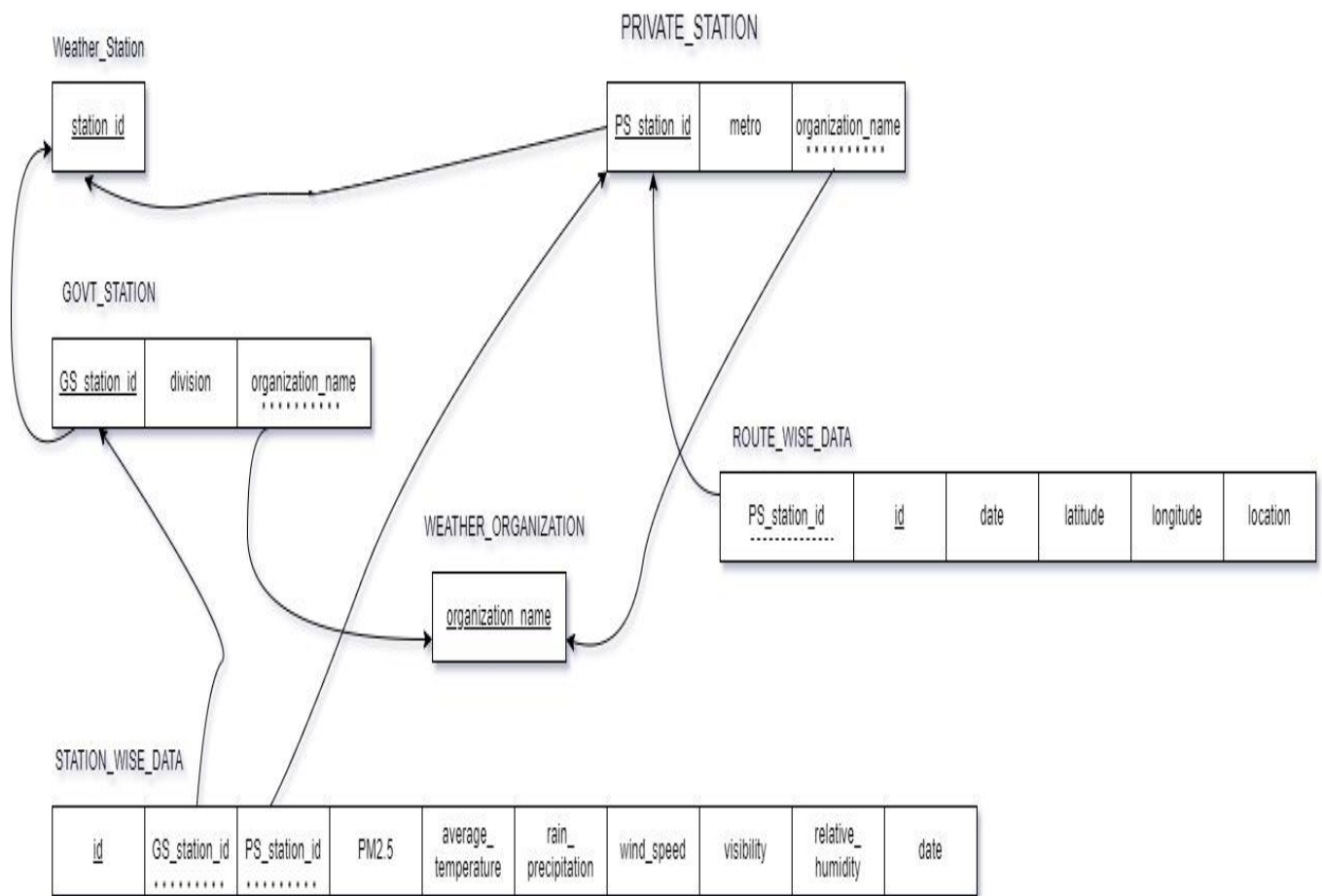


Figure : To-be ERD to relational schema

# NORMALIZATION

## 1NF

R1

<u>i</u>	p	a	l	k	n	p
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R2

<u>j</u>	g	p	q	t	r	w	v	h	e	d	o
----------	---	---	---	---	---	---	---	---	---	---	---

## 2NF

R1

<u>i</u>	p	a	l	k	n	p
----------	---	---	---	---	---	---

R2

<u>j</u>	g	p	q	t	r	w	v	h	e	d	o
----------	---	---	---	---	---	---	---	---	---	---	---

g-> d,o  
p-> m,o  
i-> p,a,l,k,n  
j-> g,p,q,t,r,w,v,h,e

GS\_station\_id (g) -> division(d), organization name (o)  
PS\_station\_id (p) -> metro(m), organization name (o)  
rout\_id (i) -> PS\_station\_id (p), ro\_date (a), latitude (l), longitude (k), location(n)  
stat\_id (j) -> GS\_station\_id (g), PS\_station\_id (p), pm2.5 (q), average\_temperature (t),  
rain\_precipitation (r), wind\_speed (w), visibility (v), relative\_humidity(h),  
st\_date (e)

## 3NF

R11

<u>p</u>	m	o
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R12

<u>i</u>	p	a	l	k	n
----------	---	---	---	---	---

R21

<u>g</u>	d	o
----------	---	---

R22

<u>j</u>	g	p	q	t	r	w	v	h	e
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## BCNF

All the relations of 3NF are same in BCNF.

Figure : Normalization

# DATA DICTIONARY

## WEATHERSTATION\_T

Name	Data Type	Size	Remarks
station_id	Varchar	9	This is the primary key of this relation. This contains the ID of the station. Ex: S12345678

## GOVT\_STATION\_T

Name	Data Type	Size	Remarks
GS_station_ID	Varchar	9	This is the primary key of this relationship. This contains the ID of the government station. Ex: G12345678
Division	text	500 bytes	This attribute contains the name of the division from which the government station is operating. Ex: Barisal
Organization Name	text	500 bytes	This is the foreign key of this entity. With relation to weather organization. This contains the name of the organization which is relative to the weather station. Ex: Carbon Fund

# STATION\_WISE\_DATA\_T

Name	Data Type	Size	Remarks
Id	Varchar	9	This is the primary key of this entity. This contains the identification of the user. Ex: D12345678
GSStation_ID	Varchar	9	This is the foreign key of the entity in relation to the government station entity. This contains the ID of the government station. Ex: G12345678
PSSStation_ID	Varchar	9	This is the foregin key of the entity in relation to the private station entity. This represents the private station's. Ex: P12345678
PM2.5	Float	5 bytes	This attribute contains the information of the pollutant in the air which is used to measure and know if the air is safe for humans or not. PM2.5 are tiny particles in the air that reduce visibility and cause the air to appear hazy when levels are elevated. Ex. cigarette smoking
avg_temp	Float	5 bytes	This attribute contains the average temperature of the weather. Ex: 36°C
Rain_precipitation	Float	5 bytes	This attribute

			contains the quantity of water deposited to the environment. Ex: 29°C
Wind_speed	Float	5 bytes	This attributes the rate at which air is moving in a particular area. Ex: 19km/h
visibility	Float	5 bytes	This attribute is the measure of the distance at which an object or light can be clearly discerned. Ex:
Relative_humadity	Float	5 bytes	This attribute is the amount of water vapor present in air expressed as a percentage of the amount needed for saturation at the same temperature. Ex: 30%
Date	Date	DD-MM YYYY	This attribute contains the date of the per day's report. . Example:01-01-2020

#### WEATHER\_ORGANIZATION\_T

Name	Data Type	Size	Remarks
organisation_name	text	500 bytes	This contains the name of the organization which is relative to the weather station. This is the primary key of this relationship.

#### PRIVATE\_STATION\_T

Name	Data Type	Size	Remarks
PS_station_ID	Varchar	9	This is the primary

			key of this relationship. This represents the private station's id. Ex: P12345678
metro	Text	500 bytes	This attribute contains the name of the metro. Ex:
Organisation_name	Text	500 Bytes	This contains the name of the organization which is relative to the weather station.

#### ROUTE\_WISE\_DATA\_T

Name	Data Type	Size	Remarks
PSSStation_ID	Varchar	9	This is the foreign key to the relationship.
id	Varchar	9	This is the primary key of the relation. This contains the id of the user. Ex: D12345678
Date	Date	DD-MM-YYYY	This attribute contains the date of the per day's report. . Example:01-01-2020
Latitude	float	8	This shows the latitude of a region. Ex: 18.864864
Longitude	float	8	This shows the longitude of a region. Ex: 76.39176
Location	text	500 bytes	This attribute shows the place where it is situated. Ex: Dhaka

# REGISTER FORM

The screenshot displays a web browser window with multiple tabs open. The active tab is 'AQMS-DBMS Gr...'. The address bar shows the URL '127.0.0.1:8000/register/'. The browser's navigation bar includes back, forward, and refresh buttons, along with a search icon and a menu icon. The page content is a registration form titled 'Create An Account'. The form has three input fields: 'Username', 'Email address', and 'Password'. The 'Username' field has a placeholder text 'Required. 150 characters or fewer. Letters, digits and @/./+/-/\_ only.' Below the fields is a 'Register' button. The background of the page is dark with a header showing 'Home / Register' and a large image of a hand using a screwdriver. The system tray at the bottom shows a temperature of 85°F, a 'Haze' weather condition, and the time 12:59 AM on 8/26/2022.

Fig: Register form

# LOGIN FORM

The screenshot shows a web browser window with the URL `127.0.0.1:8000/login/`. The page features the "Air Quality Monitoring" logo on the left and navigation links for "Home" and "Pages" on the right. A search bar is also present. The main content area is a light gray box titled "Log In To Your Account" containing two input fields: "User ID" and "password". A "Login" button is located below these fields. The browser's taskbar at the bottom shows the system time as 1:00 AM on 8/26/2022.

My Account

**Air Quality Monitoring**

Home Pages Search

**Log In To Your Account**

User ID

password

Login

85°F Haze 1:00 AM 8/26/2022

Fig: Login from



# INPUT FORM

The screenshot displays a web browser window with the address bar showing '127.0.0.1:8000/route\_input'. The browser's tab bar contains several open tabs, including 'dbms docs', 'Untitled docume', 'Presentation sha', 'Project - Google', 'Untitled Diagram', 'English', 'Classwork for S', 'CSE303L - Cours', 'CSE303L - Proj', and 'AQMS-DBMS Gr'. The main content area of the browser shows a web application titled 'Route Wise Data Entry' in a blue header. Below the header is a white box titled 'Input Form'. Inside this box, there are five input fields: 'Location:' (a text box), 'PS station id:' (a dropdown menu), 'Time:' (a text box), 'Latitude:' (a text box), and 'Longitude:' (a text box). At the bottom left of the white box is a 'submit' button. The browser's status bar at the bottom shows the system tray with icons for weather (85°F, Haze), taskbar, and system clock (1:00 AM, 8/26/2022).

Fig: Input form

## CHAPTER : INTERPRETATION

### PROBLEM AND SOLUTION :

- As the project was completely new for us It took a lot of time to understand how to implement it and could not do the proper time management .
- Failed to figure out the required time stamp of completing the coding part of the project.
- We faced inefficiency and lagging during implementing the software codes. So, we think it needs more resources and tools to build up this type of powerful web application.
- Due to time limitations and lack of lab classes, we could not learn properly and could not add features and finish the project, so over here we could not come up with any solution.

### ADDITIONAL FEATURES AND FUTURE DEVELOPMENT :

- 1. Since we are building this web application for , we will bring all the information of AIR QUALITY INDEX.
- 2. Count the views.
- 3. Automated mapping ( by the level of air pollution )

### CONCLUSION:

AQMS is an optimized version of the CASE system, where it omits the inefficiency of the CASE system. It omits the repetition of tasks. It increases productivity. AQMS has some features to analyze data. By using that Research organizations can do fruitful research and can give proper advice to Ministry and Policy-making organizations about necessary actions and also policymakers can do predictive analysis and take the proper venture to make proper change for the betterment of the country's weather.

### REFERENCE :

- CASE-<http://case.doe.gov.bd/>

### APPENDIX :

As we are working on a huge set of data, we are facing many difficulties to run those on a local machine.