Six Element Analysis (Existing):

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| --- | --- | --- | --- | --- | --- | --- |
| **Process** | **System Roles** | | | | | |
| **Human** | **Non-Computing Hardware** | **Computing Hardware** | **Software** | **Database** | **Network & Communication** |
| **Insert AQI Data** | **Bangladesh Meteorological Department:**   1. Collects the air pollution data and sends it to the ministry.   **Weather Station:**   1. Collects AQI data from the sensors and satellites and sends these raw AQI data to the ministry in hardcopy or softcopy form.   **Ministry:**   1. Receives the air pollution data from Bangladesh meteorological department in hardcopy or softcopy form. 2. Receives the raw AQI data from the weather station which was taken from different sensors and satellites in hardcopy or softcopy form. 3. Accumulates all the AQI data of each month from the ministry and sends these AQI data to the representative of CASE in hardcopy or softcopy form once every month.   **Representative of CASE:**   1. Receives the monthly AQI data from the ministry and then inserts this data into the database of CASE.   **Internal IT Expert:**   1. The IT experts make sure the data is protected in the CASE system.      1. They must make sure the website is always running. 2. They keep a backup ready in case of power failures.   **External IT Expert:**   1. Server providers manages the network resources so that any user of the CASE system can access the system from anywhere in the world. 2. The internet service providers provides internet connection to the representative of CASE to do their data entry. | **Paper and stationery:**   1. Stationary used to update on the data sheet by the workers collecting the raw data. 2. Bangladesh meteorological department and weather station can use papers to manually send the data to the ministry. 3. Ministry can use paper for printing purpose to keep a manual database. 4. Ministry can use paper to manually send the data to the representative of CASE.   **Data Sheet in Printed Version:**   1. The data sheet can be used by Bangladesh meteorological department and weather station to collect the data from the satellite and sensors.   **Cabinets:**   1. Cabinets used to store the Register Books or Data sheets prepared by the Data sourcing departments and the ministry.   **File Holder:**   1. To hold the data sheet prepared by the Bangladesh meteorological department and weather stations. | **PC/ Laptop/ Other computing device:**   1. Computers, mouse, keyboards and any other computing devices are used by all the users of CASE in order to input and select data.   **Printer:**   1. Printers are used by all the users in order to print the AQI data sheet.   **Servers:**   1. Database servers used by CASE for the representative of CASE for data entries.   **Router/ Internet Cables by ISP Providers/ Switch**:   1. From networking side, internet cables by the ISP providers or router or switch used by the users of CASE.   **Pen drive:**   1. This is used as another medium by the users of CASE to pass the data. | **CASE:**   1. It is an interface which stores data and is used by the users of CASE for data entries.   **Operating System:**   1. Any Operating system can be used by the representative of CASE like Windows, Mac or Linux.   **Application Software:**   1. Application software used by Bangladesh meteorological department, ministry and weather station like MS Excel, MS Word.   **Web Based Application Software:**   1. Bangladesh meteorological department and weather station may use application software to collect data from sources.   **Printing Software:**   1. To print the data sheets, a printing software is needed by Bangladesh meteorological department, weather station and ministry. | **MySQL**:   1. The representative of CASE can also use database system like MySQL to store the raw data.   **MS Excel Files:**   1. Data can be stored in MS Excel files.   **Register Book or Log Files:**   1. Bangladesh Meteorological department, weather station and ministry can use register book or log files in order to manually store data.   **Database System of CASE:**   1. Representative of CASE can use the database system of CASE in order to input and update data. | **Internet:**   1. Internet is required in order to input or update the data by the representative of CASE in the database of CASE.   **Mails:**   1. Mails can be exchanged among the users of CASE in order to communicate about the data entries. |
| **Verification & validation of Data** | **Ministry:**   1. By analyzing the previous month reports, they send rules and regulation that needs to be maintained in order to get better quality air in the cities.   **Municipality:**   1. Receives the rules and regulation from the ministry that needs to be maintained. 2. Delivers the rules and regulation to the representative of CASE which needs to be followed by the representative of CASE in order to verify and validate the raw AQI data.   **Representative of CASE:**   1. After receiving the accumulated data of the month from the ministry and the rules from the municipality, the representative of CASE verifies and validates the raw data and then inserts the data into the database of CASE.   **Internal IT Expert:**   1. The IT experts make sure the data is always protected in the CASE system. 2. They must make sure the website is always running. 3. They have a backup ready in case of power failures as well.   **External IT Expert**:   1. Server providers manages the network resources so that representative of CASE system can view, verify and update the data from anywhere in the world. 2. The internet service providers provides internet connection to the representative of CASE to view, verify and update the data entries. | **Paper and stationery:**   1. Paper can be used by the ministry and municipality to print the rules and regulations. 2. Stationery used by ministry and municipality in order to set the rules and regulations and also to sign and validate the data. 3. Representative of CASE use stationery to verify, update and validate the data by signature.   **Printed Version:**   1. Representative of CASE may print the before and after verification data sheets in order to keep a manual database.   **Cabinet:**   1. To store the data sheet before and after the verification process as a manual database.   **File Holder:**   1. To hold the data sheet after the verification process as a manual database. | **PC/ Laptop/ Other Computing Device:**   1. Representative of CASE uses computing device in order to view, verify and update the data in the database system of CASE. 2. Data can be stored in a computer as backup. 3. Municipality and ministry uses computer in order to set the rules and regulations that needs to be maintained.   **Printer:**   1. Municipality and ministry uses printer in order to print the rules and regulation in a paper and pass it forward.   **Routers/ Internet Cables by ISP Providers/ Switch:**   1. From networking side, internet cables by the ISP providers or router or switch used by the users of CASE. | **CASE:**   1. The CASE system is used by the representative of CASE to access the data provided by the data sources for reviewing. 2. It is used to input the verified data. 3. It is used to update the data if required.   **Operating System:**   1. Any operating system can be used by the representative of CASE and the policy makers like Windows, Mac and Linux.   **Web-based Application Software:**   1. The representative of CASE will use browsers to visit CASE and input data. | **MySQL**:   1. The representative of CASE can also use database system like MySQL to store the raw data after verification.   **MS Excel Files:**   1. Data can be stored after verification in MS Excel files.   **Register Book or Log Files:**   1. After verification, data can be stored in register or log files to maintain a manual database.   **Database System of CASE:**  Representative of CASE can use the database system of CASE in order to input and update data after verification. | **Internet:**   1. Internet is required in order to input or update the data after verification by the representative of CASE in the database of CASE.   **Mails:**   1. Mails can be exchanged among municipality, ministry and the representative of CASE in order to communicate about the data entries. |
| **Report Generation & Analyzing** | **Representative of CASE:**   1. From the AQI data received from the ministry every month, the representative of CASE generates reports and upload it in the database of CASE, which is shown on the website of CASE.   **Ministry:**   1. Can view and download the air pollution report from the website of CASE, which is later analyzed and new rules and regulations can be sent to the Municipality which needs to be maintained.   **Municipality:**   1. Can view and download the monthly report from the website of CASE and then analyze those reports for further new plans.   **User:**   1. Can view and download the report from the website of CASE and get information about the country’s air quality.   **Internal IT Expert:**   1. Creates the report template creating and editing module in the CASE system for the representative of CASE, so that they can create and edit templates if required. 2. Maintains the CASE system so that if there is any problem they can fix that.   **External IT Expert:**   1. Server providers in the CASE system manages network resources so that the data can be viewed, report can be generated and uploaded by the representative of CASE. 2. The internet service providers provide internet connection to municipality, ministry and the representative of CASE in order to make new policies after analyzing the report and to upload the reports generated. | **Paper and stationery:**   1. Paper can be used by the ministry, municipality and user to print the generated report from CASE. 2. Stationery is used by ministry and municipality in order to analyze the report and make new set of rules and regulations.   **Printed Version:**   1. Ministry, municipality and user may download and print the reports to analyze.   **Cabinet:**   1. To store the monthly reports in printed version.   **File Holder:**  To hold the data sheet after the verification process as a manual database. | **PC/ Laptop/ Other Computing Device:**   1. Representative of CASE requires computing device in order to upload the generated report in the database of CASE. 2. Representative of CASE requires computing device to make changes in the template of the report, if required.   **Printer:**   1. Municipality, ministry and user uses printer in order to print the monthly reports of the areas of Bangladesh.   **Routers/ Internet Cables by ISP Providers/ Switch:**   1. From networking side, internet cables by the ISP providers or router or switch used by the users of CASE. | **CASE:**   1. It is used to upload the reports by the representative of CASE. 2. It is used by ministry, municipality and user to download and analyze the reports.   **Operating System:**   1. Any operating system can be used by the representative of CASE, the policy makers and users like Windows, Mac and Linux.   **Web-based Application Software:**   1. The representative of CASE will use browsers to visit CASE and input data.   **Application Software:**   1. The graphs in the report are generated using MS Excel by the representative of CASE. 2. The report template are created in MS Word. | **MySQL**:   1. The representative of CASE can also use database system like MySQL to store the monthly reports after generating those.   **Database System of CASE:**   1. Representative of CASE can use the database system of CASE in order to upload the reports.   **HDD:**   1. The downloaded reports can be stored in a hard disk for backup. | **Internet:**   1. Internet is required in order to upload reports by the representative of CASE in the database of CASE. 2. Internet is required in order to access the website of CASE to view or download the monthly AQI reports.   **Mails:**   1. Mails can be exchanged among municipality, ministry and the representative of CASE in order to communicate during the analyzing of the reports. |