| **Process** | **System roles** | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Human** | **Non-computing Hardware** | **Computing hardware** | **Software** | **Database** | **Communication & Network** |
| **Basic Data Entry** | **A. Data Collector:**   1. Gather air quality data from enlisted sources 2. Send the raw data to Data Analyst   **B. Data Analyst:**   1. Received the raw data from the data source. 2. Send the analyzed and compiled data to the data entry Manager   .**C. Data Entry Manager:**   1. Received the compiled and analyzed document from data Analyst. 2. Provide the data into the system 3. Log into AQM 4. Select appropriate data entry form 5. Enter the data in the system. User needs to provide location, AQI, air quality state and range 6. Click the save button to save the data in the system | 1. **Paper and stationery** 2. Data collectors use it to manually jot down the data from the data sources 3. Papers can be used for printing purposes to keep a manual database.   **B. File Holder**   1. It is used to organize the papers 2. To make physical reports 3. To send to the data Analyst.   **C. File Cabinet (Physical Archive)**   1. It is used for storing the printed data version as a manual backup. | 1. **PC/ Laptop/ Other computing device** 2. Various computing devices can be used to visualize, store and compile raw data 3. **Printer** 4. printer used to print data from data sources 5. It is used to make manual pdf 6. **Server** 7. Database uses the server to store the monthly air quality reports 8. AQM System is hosted in the server | 1. **AQM system** 2. Interface which stores data and used by the Data Entry Manager to enter the data manually in the data entry form 3. **Operating system** 4. Any operating system used by a Data Entry Manager. Eg : Mac, Windows, Linux etc | 1. **Database of AQM** 2. System uses the Database to store the monthly air quality reports 3. **Physical log book** 4. It is used to keep physical records of the monthly reports | 1. **Telephone** 2. Can be utilized by data collectors to contact data providers. 3. Can be used by the Data Collectors to call the Data Analyst to notify about their task being done. 4. Can be used by the Data Entry Manager to delegate tasks to Data Collectors. 5. **Internet** 6. Internet connection is required to use the AQM system and use it’s functionalities like login, logout, data entry and viewing 7. Used by Data Entry Manager to enter data in AQM 8. **Email** 9. Data Entry Manager can email other polapans to notify about any moner madhuri they want. |
| **Data Validation & Update** | 1. **Data Collector** 2. Once received a request to recollect data from the Data Analyst, they start recollecting the data. 3. They gather air quality data from enlisted sources. 4. Make a physical report of the collected raw data. 5. Send the physical report to the Data Analyst..   **B.Data Analyst**   1. Request the Data Collector to recollect the data after it is found faulty. 2. After receiving the collected data Make a physical report of the collected raw data. 3. Send the physical report to the Data entry manager... | 1. **Paper and Stationary** 2. Data collectors use it to manually jot down the corrected data from the data sources 3. Papers can be used for printing purposes to keep a physical record 4. Used by the Data Analyst to jot down the data which seemed faulty with the physical document. 5. **Seal stamp** 6. Used by Data Entry Manager to stamp the verified physical document 7. **Cabinet** 8. It is used for storing the printed data version (the physical document) as a manual backup 9. **File Holder** 10. It is used by the Data Entry Manager to organize the documents 11. To make physical reports 12. To send to the data entry managers 13. **Journal / Research Paper/ Books / Newspaper** 14. Data Analysts can use these to analyze when verifying the updated data again. | 1. **PC/ Laptop/ Other computing device** 2. Used by the Data Analyst to observe the data trend. ( If found faulty, the verification process starts once he requests Data Collector to recollect the data) 3. Used by the Data Entry Manager to new data in the AQM system. 4. Used by the users to log in the AQM system 5. Data Entry Manager will also store the updated data in the computer as a backup. 6. **Printer** 7. Data Analyst can print the data trend in the paper and observe it to make a decision. 8. **Pendrive** 9. Data Entry Manager can keep the updated physical document in the pendrive to store it as a backup. 10. **Server** 11. Database uses the server to store the updated air quality reports. 12. The AQM System is hosted on the server. 13. The data in the AQM System is provided from the server. | 1. **AQM System** 2. The system verifies the users and shows the appropriate interface 3. The software used for viewing the monthly Air Quality Reports by the Admin 4. It is used to update the faulty data through a form 5. Data Analyst uses it to compare the data trend again with the physical document to identify the faulty data. 6. **Operating System** 7. Any operating system used by a Data Entry Manager. Eg : Mac, Windows, Linux etc 8. **Application Software** 9. Data Entry Manager can initially make a draft of the form in MS Word/ Ms Excel and then finalize it in the AQM system. 10. **PDF Viewer** 11. User can view the data trend in the pdf version. | 1. **Database of AQM** 2. System uses the Database to store the updated monthly air quality reports 3. **Physical log book** 4. It is used to keep physical records of the monthly reports 5. The record of data being updated is kept here | 1. **Telephone** 2. It can be used by the Data Analyst to call the Data Collectors to give updates about their task. 3. **Internet** 4. Internet connection is required to use the AQM system and use it’s functionalities like login, logout, data entry, viewing and updating 5. Used by Data Entry Manager to update data in AQM System 6. **Email** 7. A Data Analyst can email the data collector to let them know about anomalous data. 8. The Data Collector can inform the analyst after recollecting the data. |
| **4. Viewing** | 1. **Researcher/ General**   **Viewer**   1. Logs into the AQM system.(user not validated as logged in as guest) 2. Request for Data 3. System provides the data | **A. Paper**   1. Used for printing purposes by the Researcher. | **A. PC/ Laptop/ Other computing device**   1. Used by Researcher/general viewers to view reports, from the AQM system.   **B. Printer**   1. Researchers can use it to print   **D. Routers/ Internet Cables by ISP Providers**   1. From the networking side, internet cables by the ISP providers or routers are used by the Researcher/General Viewers.. | **A. AQM System**   1. The system validates and verifies the users. 2. Provides an appropriate interface for the users. 3. Used for viewing the monthly Air Quality data trends/ graphs, reports by , researchers/general viewers.   **B. Operating System**   1. Any operating system used by the researcher /general viewer. . Eg : Mac, Windows, Linux etc.   **C. Application Software**   1. Researchers/general viewers can jot down important notes by using MS Word.   **D. PDF Viewer**   1. Researchers/general viewers can view the data trends / graphs , reports in the PDF version.   **E. Web- based Application Software**   1. Researchers/general viewers use browsers to log in into the AQM system. 2. Researchers/general viewers use to view the data trends/ graphs , reports.   **F. Printing Software**   1. Printing software used for printing the Air Quality reports, graphs byresearchers/general viewers. | **A. Database of AQM System**   1. AQM database stores information of all the appropriate users.( this is useful while the system validates the user while logging in into the system)   . | **A. Internet**   1. Internet connection used by Researcher/general viewers and to log in, log out, viewing the AQM system.   .   1. Used when the AQM system is storing all the data. 2. Used when the AQM system stores the updated and verified air quality report in the system. |