

Summary of the Requirements for the Weather Mapping System (WMS)

System Overview

A weather mapping system (WMS) is required to generate weather maps on a regular basis using data collected from remote, unattended weather stations and other data sources such as weather observers, balloons and satellite. Weather stations transmit their data to the area computer in response to a request from that machine.

The area computer system validates the collected data and integrates the data from different sources. The integrated data is archived and, using data from this archive and a digitized map database, a set of local weather maps is created. Maps may be printed for distribution on a special-purpose map printer or may be displayed in a number of different formats.

Typically, the weather data collection system establishes a modem link with the weather station and requests transmission of the data.

Then, the weather station sends a summary of the weather data that has been collected from the instruments (e.g. anemometer, barometer, ground thermometer) in the collection. The data sent to the weather data collection system are the maximum, minimum and average ground temperatures, the maximum, minimum and average air pressures, the maximum, minimum, and average wind speeds.

Weather stations are usually asked to report once per hour but this frequency may differ from one station to another and be modified in the future.

Weather stations are also automatically monitored by the system, for start-up, shutdown, and for instrument testing and calibration.

Another function carried out by weather stations is pollution monitoring. More specifically, there is an air quality meter that computes the amount of various pollutants in the atmosphere collected from pollution monitoring instruments (e.g. No meter, Smoke meter and Benzene meter). The pollution readings are transmitted at the same time as the weather data. The pollution data collected are NO, smoke and benzene rates.

Product Features

WMS provides a range of map processing operations (e.g. two-dimensional and three-dimensional mappings), weather data storage for the maps, and network access to the maps for remote viewers. Its key marketing features are the following:

- A user-friendly operator environment
- The throughput of weather data acquisition is 50% higher than previous product
- Maps display can be as fast as the maximum hardware speed
- Is designed for easy upgrade to new platforms
- Has open platform connectivity
- Can be connected to peripherals, including printers and digital imagers.

A single control panel is provided with each WMS unit. Additional independent viewing stations are also available.

The Future of WMS

WMS must be designed to be extensible, maintainable, and portable. Its design must be flexible enough to accommodate certain expected changes. The product requirements may change somewhat during development and certainly will change over the lifetime of the product. The physical characteristics of the weather data acquisition instruments may change as new models are introduced. As the processing power of the system increases, more and more work that was the responsibility of the users will shift to the system. Other product features will also likely change. The product needs to remain compatible with new or evolving standards for file formats and communication of weather information.

In addition, the technology affecting the software components is likely to change over the lifetime of the system. WMS may have to be improved to handle upgrades to commercial components that are part of the product, and the target software environment is likely to change as upgrades are introduced.

The Company

The software company in charge of the development of the WMS has faced significant turnover of their skilled personnel in the last few years, mainly due to the competitive job market. Facing at the same time tight deadlines set by the customers to deliver useful business functionality; the company has decided to make use of significant third-party products and packages as an integral part of their application. However they will also maintain development and maintenance control of the mission-critical components of their applications.