Mission statement: To provide agricultural businesses with up to date and accurate weather information to maximize product output.

Location: United States

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Project Description

- **<u>Problem</u>**: For years now, many farmers and agricultural businesses lose profit from their product output due to lack of ideal weather conditions.

- **<u>Solution</u>**: At WeatherCo, we work with *undying* effort to provide accurate and up-to-date information for weather dependent agriculture companies.

Business Concept

- Every year there are hundreds of crops wasted due to inaccurate weather data. In order to prevent such catastrophes, WeatherCo works diligently on an adaptive weather database for its clients.

- With the use of such an advanced weather database, our clients are able to avert certain preventable disasters.

Database Description

- With this database, our clients will be able to customize to their preferences, which sets of data that will be displayed.

- With ease and efficiency it appeals to a diverse group of companies from the large-scale companies to the smaller and more local companies.
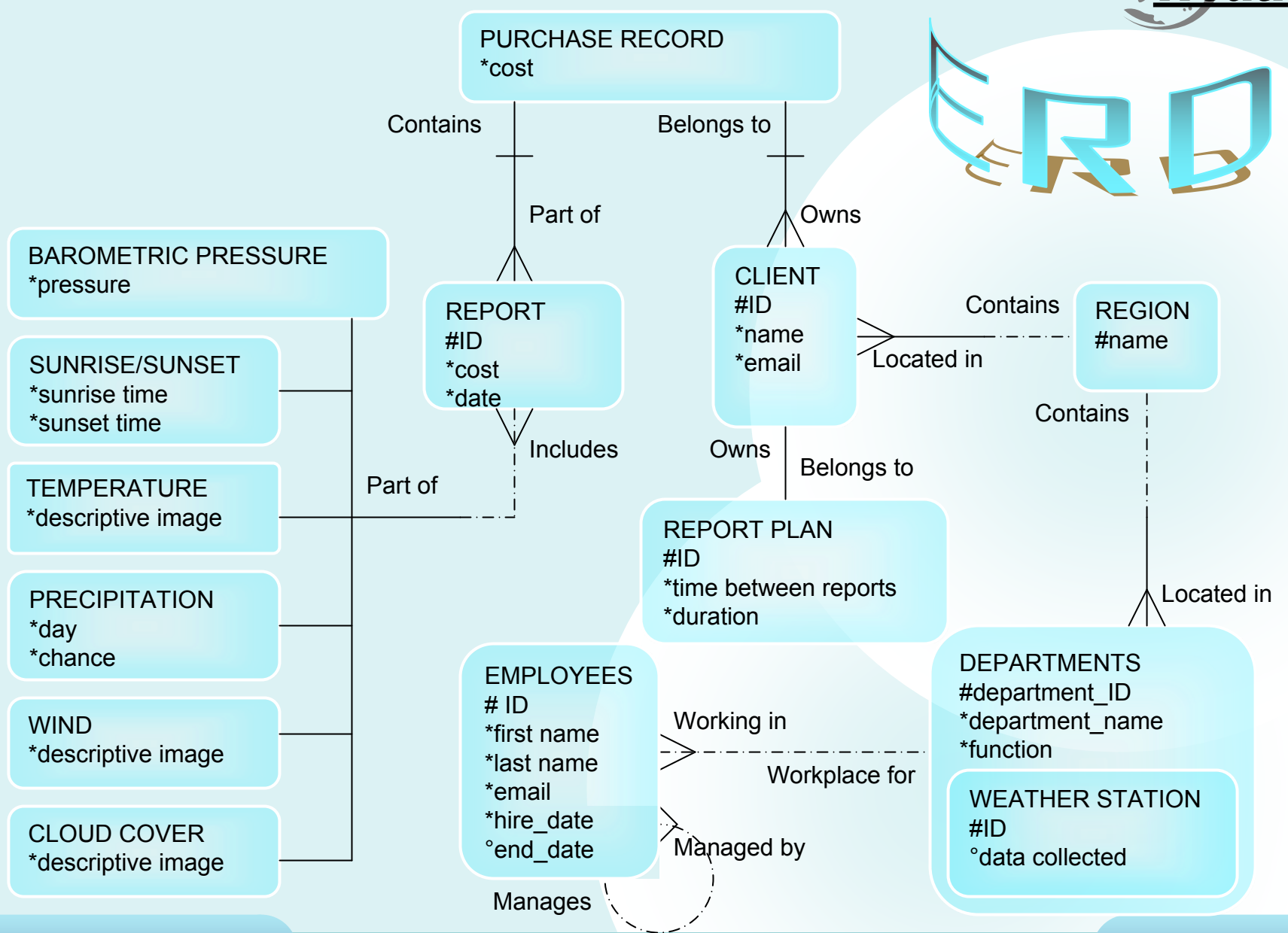
Research Reference

- www.weather.com
  - National Weather Service
- www.dtn.com
  - Meteorological Database
- www.agebb.missouri.edu/weather/history/index.asp
  - Missouri weather historical database
- www.weatherbase.com
  - Weather database with in-depth information
- www.weatherclimate.com
  - Average climate temperature for cities

WeatherCo Objectives

- The main objective of the WeatherCo meteorological database is to provide up-to-date, yet personalized weather transmissions to agriculture-based companies.

- Our clients will be able to access the database and receive accurate weather data reports that could benefit in the production output.

- With such a unique retrieval and storage system, our clients will be able to access past, present and future weather conditions at any given moment.

- The WeatherCo database allows our clients to easily access their data from many platforms ranging from cell phones to internet-enabled computers.

Business Needs

- The WeatherCo meteorological team had to design a database that was as efficient as possible in providing immediate, yet accurate data to our clients.

- We need to find a way to proficiently store data with some time constraints to minimize redundancy and maximize efficiency.

- We assume that the customer or client knows what information he or she needs, therefore they will know what information they should receive.

ERD

PURCHASE RECORD
*cost

Contains

Belongs to

Part of

Owns

BAROMETRIC PRESSURE
*pressure

CLIENT
#ID
*name
*email

Contains

REGION
#name

Located in

REPORT
#ID
*cost
*date

SUNRISE/SUNSET
*sunrise time
*sunset time

Includes

Contains

TEMPERATURE
*descriptive image

Part of

Owns

Belongs to

Located in

PRECIPITATION
*day
*chance

REPORT PLAN
#ID
*time between reports
*duration

WIND
*descriptive image

EMPLOYEES
ID
*first name
*last name
*email
*hire_date
°end_date

Working in

DEPARTMENTS
#department_ID
*department_name
*function

Workplace for

CLOUD COVER
*descriptive image

WEATHER STATION
#ID
°data collected

Managed by

Manages

ERD Documentation

Each BAROMETRIC PRESSURE must be part of one or more REPORT.

Each REPORT may include one BAROMETRIC PRESSURE.

Each SUNRISE/SUNSET must be part of one or more REPORT.

Each REPORT may include one SUNRISE/SUNSET.

Each TEMPERATURE must be part of one or more REPORT.

Each REPORT may include one TEMPERATURE.

Each PRECIPITATION must be part of one or more REPORT.

Each REPORT may include one PRECIPITATION.

Each WIND must be part of one or more REPORT.

Each REPORT may include one WIND.

Each CLOUD COVER must be part of one or more REPORT.

Each REPORT may include one CLOUD COVER.

Each REPORT must be part of one PURCHASE RECORD.

Each PURCHASE RECORD must include one or more REPORT.

ERD Documentation

Each PURCHASE RECORD belongs to one or more CLIENT.

Each CLIENT most own one or more PURCHASE RECORD.

Each CLIENT must be located in one or more REGION.

Each REGION may be the location of one or more CLIENT.

Each REGION may contain one or more DEPARTMENT.

Each DEPARTMENT must be located in one REGION.

Each DEPARTMENT may be the workplace for one or more EMPLOYEE.

Each EMPLOYEE may work for one DEPARTMENT.

Each EMPLOYEE may be managed by one EMPLOYEE.

Each EMPLOYEE may manage one or more EMPLOYEE.

SQL Documentation

- The "Descriptive Image" which stores the temperature, wind and cloud cover data, stores the information in the RGBA values for each pixel in a 24-bit .bmp image.

- For temperature, the red channel stores low temperature, green channel stores high temperature, and the blue channel stores average temperature. As temperatures range from -28° C to 100° C, RGB values range from 0 to 255.

- For wind, the red and green channels store direction and magnitude and the green channel is ignored. The direction of the wind is broken down into X and Y vectors and stored in the red and green channels. The red channel's values from 0 to 255 represent magnitudes of 128 to negative 128, or 128 N to 128 S. The green channel handles magnitude in the longitudinal direction.

- For cloud cover, the red channel stores essentially a 'map' of cloud cover. The values range from 0 to 255 based on cloud cover.

- The image itself is a 200 * 400 image and is overlayed on a Mercator projection of a world map. The pixel over a certain area is the value for that area.

SQL Documentation

- Whether a department is a weather station which collects data or not is handled in code. Departments also have functions ranging from sales to buying data from other companies.

- Reports are generated six months in advance, and kept until they are six months old. Report plans can be purchased by clients which send them regular reports instead of a single one.