Musketeers - Production Lifecycle Manager
(Developer Guide)

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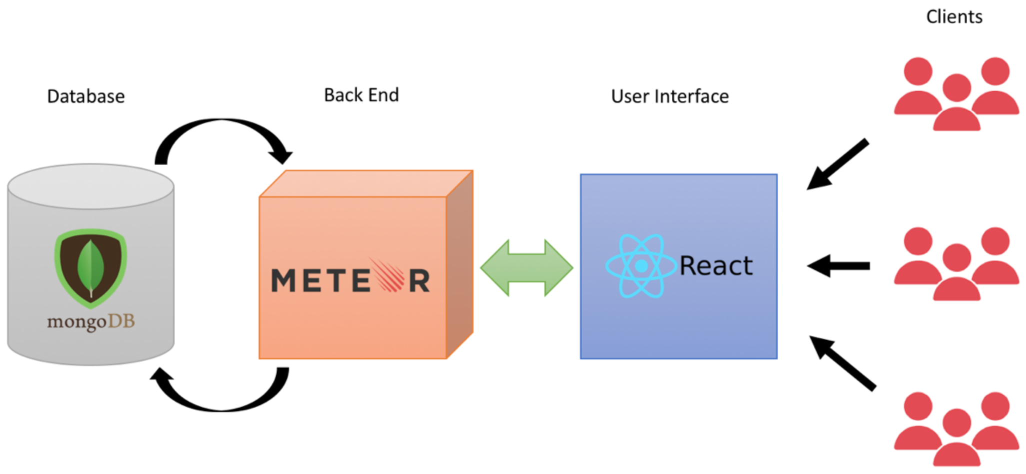
Overview

Production Lifecycle Manager is a tool that provides clients a way to manage food production, including inventory, logistics, sales, etc. It allows for complete management of the ingredients. The system tracks all the ingredients the client owns and provides additional information such as cost information, storage information, etc. The application also tracks the vendors which supply the stock. While the administrator can add, edit, delete, and bulk import ingredients, authorized users can order and consume ingredients from the inventory while the system tracks their overall purchases and usage of ingredients. It is a cutting-edge piece of technology designed to put the old days of spreadsheets and macros to waste and gives the clients total control over their inventory.

High Level Design

At a high level, our design is separated into three parts: (1) database (2) back-end and (3) user interface. We use NoSQL MongoDB as our database, Meteor as our back-end web framework, and React as our front end. The diagram can be seen below:



At the core of our design, clients will interact our software through a simple and user-friendly interface that is easy to understand and navigate. Through connections between our database and server, the user will instantly see the changes they implement on the application.

The connections made between the different key sectors are through event handling and listeners. When the user makes interacts with the user interface, the "events" that occur trigger methods in our Meteor layer. Our Meteor layer interacts with our database layer through a publish–subscribe pattern. Finally, through listeners, the changes made within our database is reflected in our user interface.

Technologies In Use

This section talks about the main technologies and the features we utilize to bring our application to life.

MongoDB

Our database of choice is MongoDB. MongoDB is an open-source, cross-platform, document-oriented database program that runs NoSQL. Within each database, the documents are JSON-like with schemas. Meteor and Mongo run together fairly well and there is plenty of documentation to get these two stacks to function together. Through the publish-subscribe pattern, databases are "published" and certain classes can "subscribe" to these databases to access them. Synchronization code does not need to be written as the changes propagate immediately. Through this pattern, we can also ensure that any feature of the client does NOT have direct access to the database, and that all database handling is on the server side.

Meteor

Meteor, or otherwise known as Meteor JS is a free, open-source, isomorphic, JavaScript web framework written using Node.js. It integrates with MongoDB well, and also with the React library. Meteor allows for rapid prototyping and produces cross platform code (Android, iOS, Web). Functionality on this back-end layer is done through Meteor methods. Meteor methods are Meteor's remote procedure call system to write to the database. Essentially, a method is an API endpoint for the server and is tightly integrated with the publish-subscribe pattern and data loading. This also integrates with UI framework React (see next).

React

React, or ReactJS, is a JavaScript library for building user interfaces. It is open-source and maintained by Facebook. React works in a very modular way, in which the way we view our application is no longer *whole*, but rather a sum of components. That is the basis for React. You build components with different functionality and then you put it all together, including components within components. Components can be used repeatedly, and each component can change without affecting the other components on the application. This allows developers to create web-applications that use data and change without ever reloading the page. It has a lot of support from the open source community, as well as plenty of libraries to streamline development.

At the core of React is the **render()** method. The "rendering" of a component is written in HTML, and is what you see on the screen. The rest of the class is written in JavaScript and provides functionality to the component. Each component also has default React methods that are "lifecycle methods" that you can override to run code at particular times in the process.

Configuring a Development/Build Environment

Installation

To install Meteor, click the link here and run the command to install the latest version of Meteor for your operating system.

Environment Setup

A great tutorial of Meteor with React can be found here.

But in the meantime, feel free to follow the steps below to set up your environment.

1) Create base application

Go to your terminal and type:

```
meteor create my-app
```

This creates a new folder called `my-app` that contains all of the files that a Meteor app needs.

```
client/main.js          # a JavaScript entry point loaded on the client
client/main.html        # an HTML file that defines view templates
client/main.css         # a CSS file to define your app's styles
server/main.js          # a JavaScript entry point loaded on the server
package.json            # a control file for installing NPM packages
package-lock.json       # Describes the NPM dependency tree
.meteor                 # internal Meteor files
.gitignore              # a control file for git
```

To run your app, cd into your folder `my-app` and type `meteor`.

This will launch your application on `http://localhost:3000`.

You can mess around with this starter app in the meantime and see how the boilerplate code works between client and server. When you save files that you edit in your code editor, the page in the browser will automatically update with the new content. This is Meteor’s “hot code push” and makes changes available to see immediately without having to relaunch your application.

2) Install React

Go to your terminal and type:

```
meteor npm install --save react react-dom
```

Congrats! You have now installed React for your Meteor application and are ready to render components. Once again, would highly recommend going through the Meteor with React Tutorial to see how everything works. It outlines how to create a collection (database), event handling, user accounts, security, Meteor methods, the publish-subscribe pattern, and testing.

Another good resource to look at to look at Pup, a Meteor with React web application boilerplate. It is a full web application with basic features and plenty of documentation to help you navigate the basics of creating a full-scale application.

Database Schema

Users

Users contain the following:

- _id
- createdAt
- services
  - password
  - resume
- username
- email
  - email
  - verified
- profile
  - name
    - first
    - last
    - username
- roles

This is the built in Users database that is created using the Accounts library from Meteor. It contains your standard profile information (first name, last name, user name, email) as well as providing salting and encryption for passwords and verification of email. The resume contains the login tokens when using the application.

Roles

Roles contain the following:

- _id
- Name

This is the built in Roles database that is created using the Roles library from Meteor. Very standard database collection of roles that makes checking roles easier using the Roles API.

Ingredients

Ingredients contain the following:

- _id
- name
- package
- temperatureState
- vendorInfo
    - vendors
- quantity

Ingredients collection contain all the necessary information that will be displayed on the inventory. It also contains an array of vendors that links up the vendors and vendor prices for each ingredient.

Vendor

Vendors contain the following:

- _id
- vendor (name)
- contact
- FCC (freight carrier code)

Vendors contain the name, the contact information, and the freight carrier code within a single entry.

Storage Capacities

Storage Capacities contain the following:

- _id
- name
- type
- capacity
- used

Storage capacities contain the name, type of storage, total capacity, and used capacity per entry.