

MICHIGAN STATE

UNIVERSITY

Project Plan

Shrink Reduction Using Blockchain Technology

The Capstone Experience

Team Meijer

Moritz Greiss

Lucas Banks

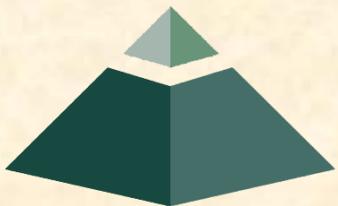
Mohammad Yousafzai

Matthew Wilimberg

Phillip Litchfield

Department of Computer Science and Engineering
Michigan State University

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*From Students...
...to Professionals*

Functional Specifications

- Develop a blockchain system to reduce shrink
- Track highly-perishable items to prevent waste
- Create an iOS and web application to access the data
- Notification system to alert users when products are close to expiration
- Dashboard to display product analytics



Design Specifications

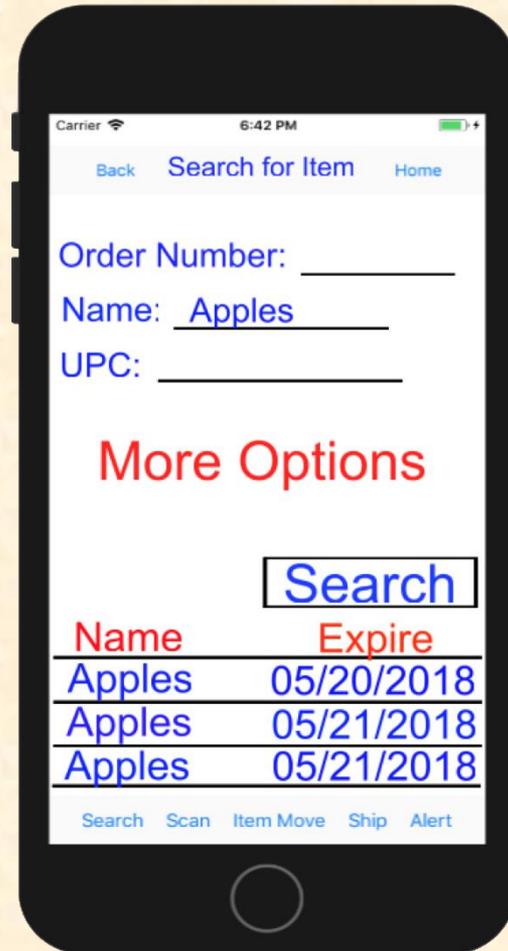
- Single member network blockchain to store product information
- Access data through SQL Database
- iOS and Web App as user interfaces
- PowerBI for Web App dashboard analytics



QR Scanner



Search for Product



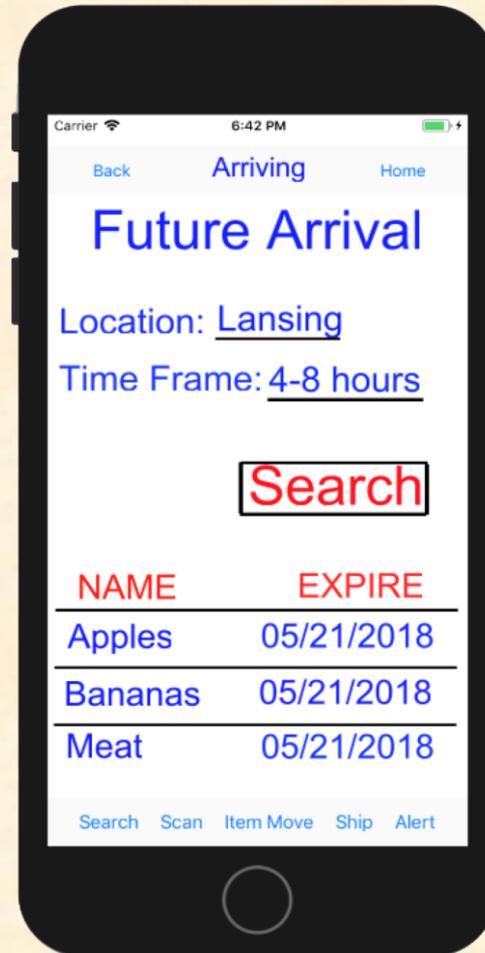
Product Info



Alerts



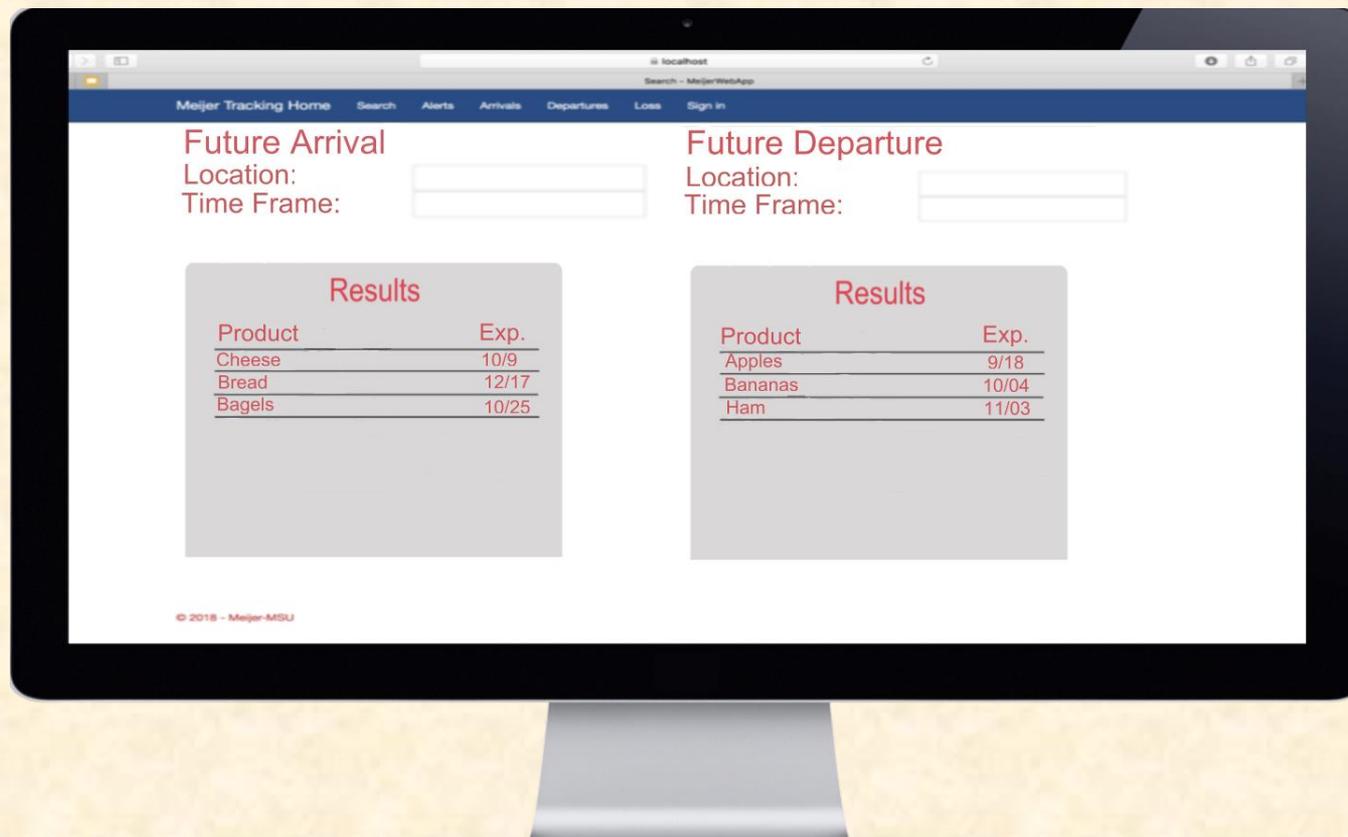
Future Arrivals



Web Loss page



Future Arrival

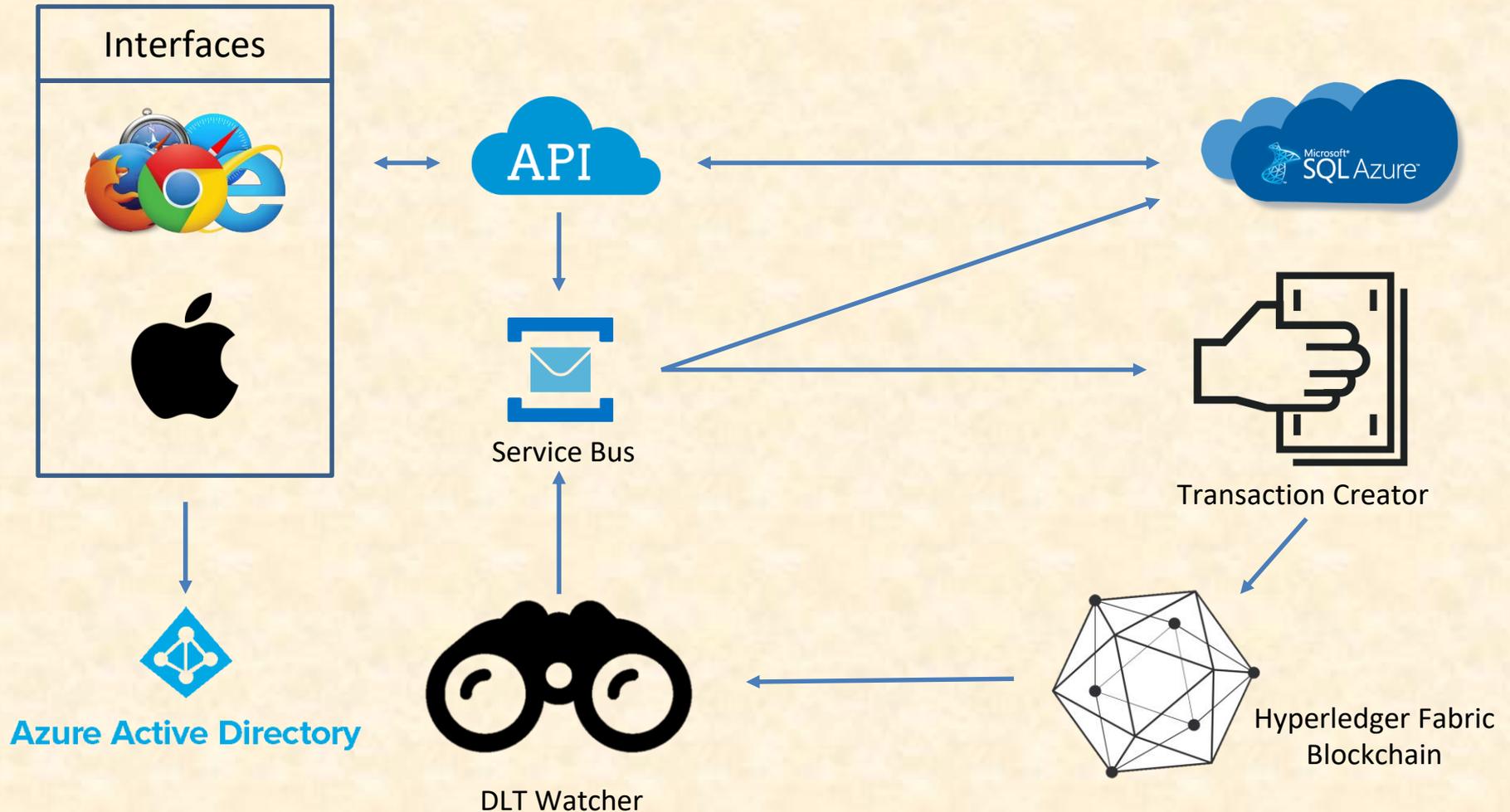


Technical Specifications

- iOS and Web APP
 - Used to access and update data
- Gateway Service API
 - Connection point for iOS and Web apps to data
- SQL Database
 - Store all product information for easy query
- Hyperledger Fabric Blockchain
 - Store and distribute data across nodes
 - 3 kinds of nodes – Member, peer, orderer
- DLT Watcher
 - Updates SQL Database when changes are detected



System Architecture



System Components

- Hardware Platforms
 - Apple iPhone
 - Computer for Web App
- Software Platforms / Technologies
 - Microsoft Azure
 - Microsoft Azure Blockchain Workbench
 - Azure SQL
 - Hyperledger Fabric Blockchain
 - XCode
 - ASP.NET
 - PowerBI
 - Microsoft Visual Studio
 - VSTS
 - QR Scanning



Risks

- Implementing Blockchain Technology
 - Difficulties in starting up an initial blockchain framework
 - Spinning up a simple 2 node network which will be expanded
- Creating Effective Smart Contracts
 - Creating a contract that will add/edit data to the blockchain
 - Using “Go” to write chaincode to add blocks to blockchain
- Integrating iOS and Web Applications
 - Ability to read data from SQL Database and display
 - Use Azure SQL Server Management Studio to pull queries
- Integrating QR Code Product Tracking Technology
 - QR reading abilities to process product information on device
 - Configuring library to pull correct information from QR code



Questions?

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