MICHIGAN STATE UNIVERSITY

Project Plan
Fundamenta

The Capstone Experience

Team Quicken Loans

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Spring 2018

From Students…
…to Professionals

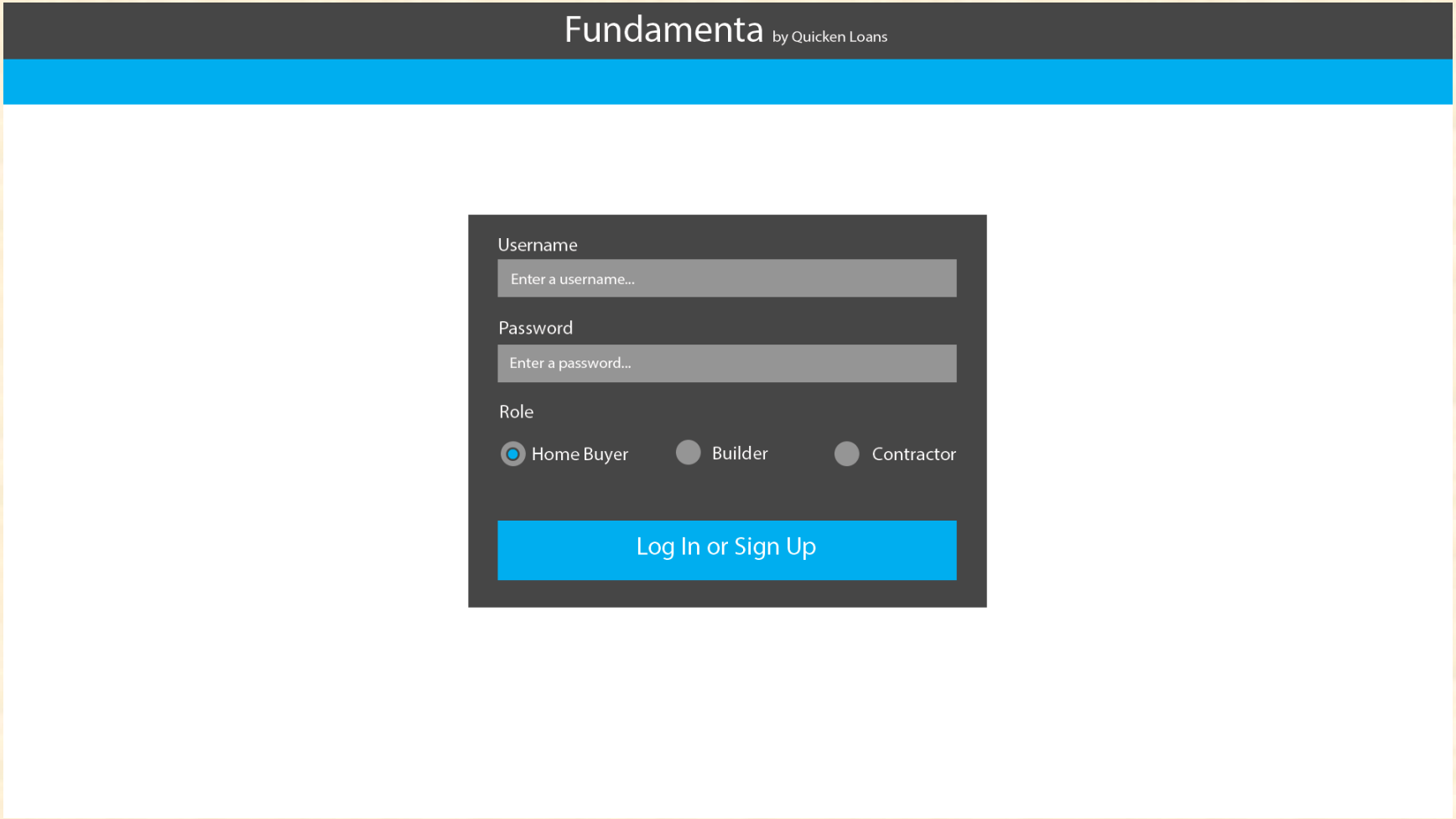
Functional Specifications

- Web application
- Allows collaboration among participants involved in a home build
- Indicates workflow and tasks assigned to each participant
- Ensures accountability among all parties
- Provides real time updates and brings transparency to process
- Stores build history in permanent record

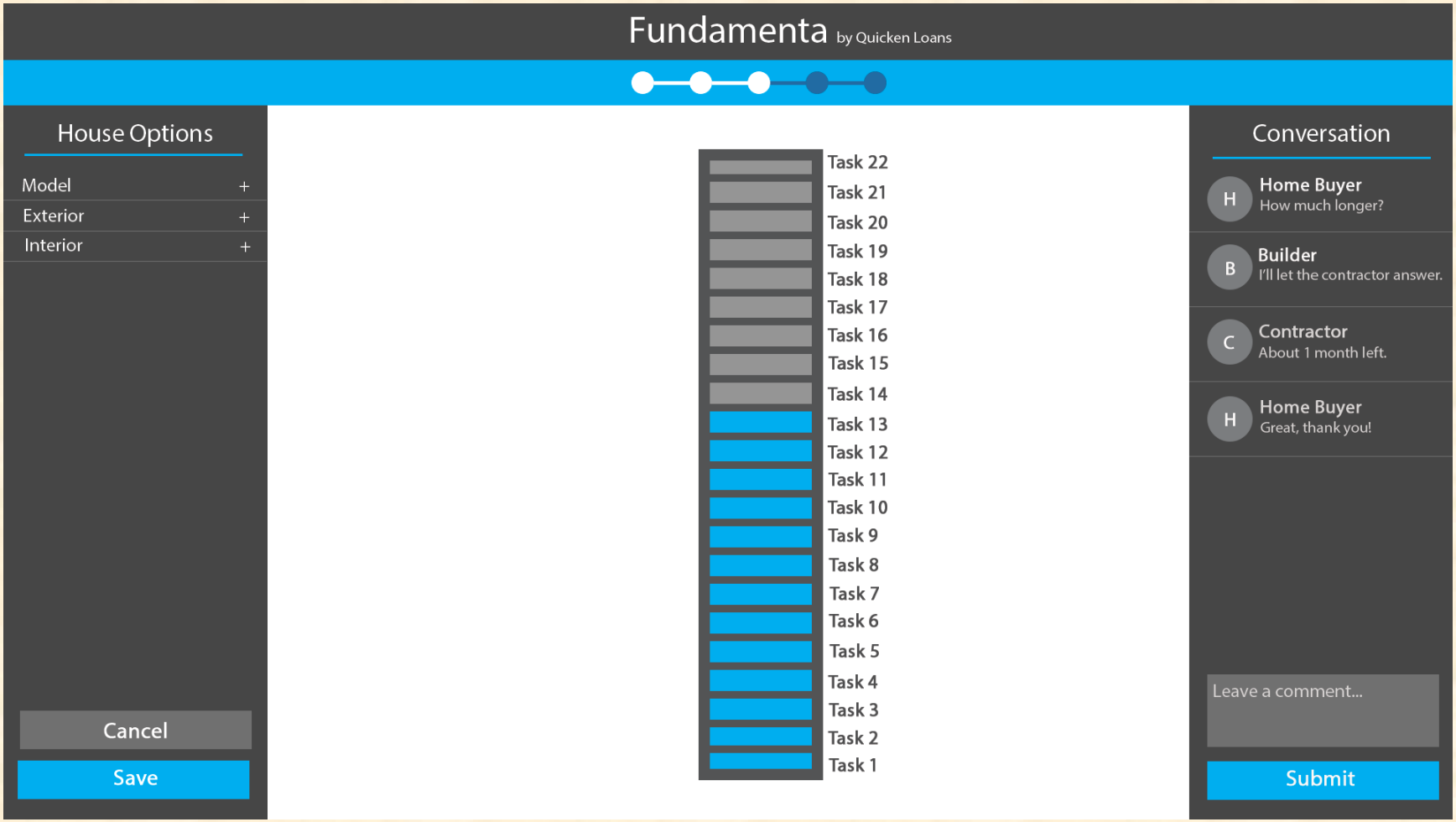
Design Specifications

- Allows user login
- Creates workflow for home build
- Supports home buyer selection of home design
- Displays tasks currently assigned to each participant
- Allows users to mark tasks complete
- Displays progress of home build

Screen Mockup: User Login

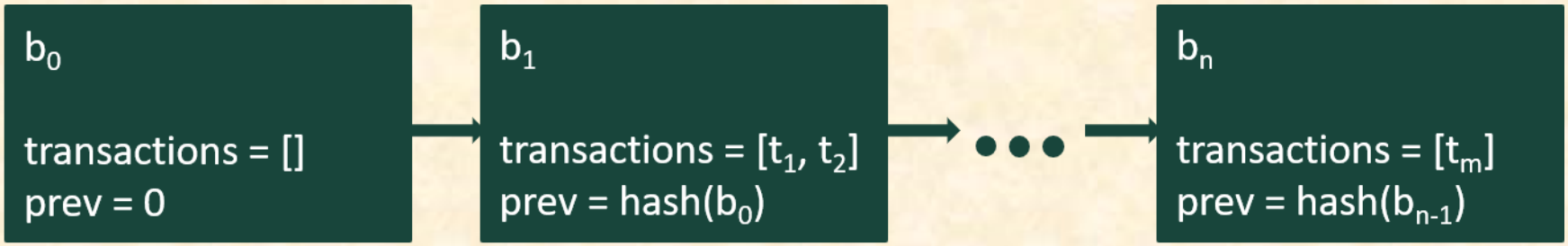


Screen Mockup: Build Workflow



“What is Blockchain…”

- Shared, continuously verified database
- Distributed with no centralized version
- Persistent, immutable, public, verifiable ledger
- Blocks contain transactions
- Integrity verified via hash of previous block



“…and Why Should I Care?”

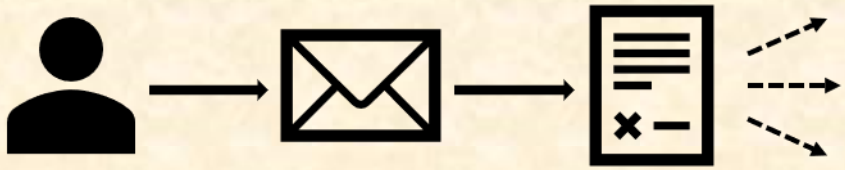
Proof of Work

- Digital Currencies: Bitcoin, Ethereum, etc.
- Challenging to find, easy to verify solution
- Upon completion, a new block is created
- Enables mining and reward system

```
> hash(x * y) = ac23dc...0
> x = 5
> #Solution: y = 21
```

Smart Contracts

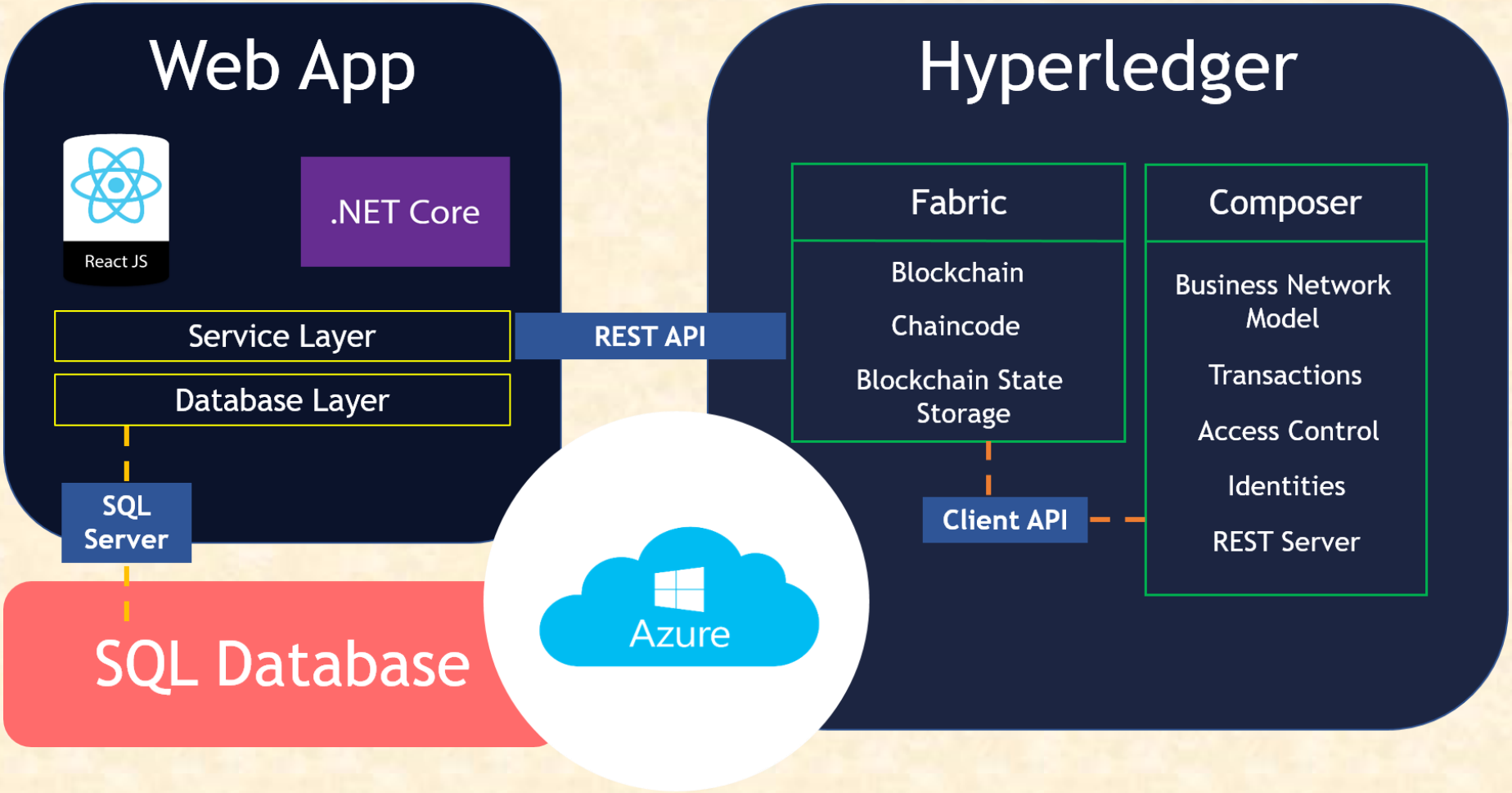
- Business networks: Ethereum, Hyperledger Fabric, etc.
- Sections of executable code associated with the blockchain
- Activated with transactions, trigger side effects



Technical Specifications

- Blockchain
  - Hyperledger Fabric Blockchain
  - Hyperledger Composer Framework
    - Modeling Language, Access Control Language
    - Transactions and Smart Contracts
- Web app
  - .NET Core 2.0 (C#)
  - React
- SQL Server

System Architecture



System Components

- Software Platforms / Technologies
  - Microsoft Azure
  - Microsoft SQL Server
    - User Management
  - Visual Studio, WebStorm, Visual Studio Code
  - Visual Studio Team Services
    - Git Repo
    - Kanban Board
    - Continuous Deployment

Risks

- Blockchain Smart Contracts
  - Description: Need smart contracts that modify the blockchain and state of home effectively
  - Mitigation: Start with small simple contracts; expand existing examples
- Technology Stack Integration
  - Description: Diverse technologies are being used; little experience integrating a full project environment
  - Mitigation: Integrate technologies before completion of parts
- Blockchain on Azure
  - Description: A RESTful API is needed to modify the blockchain after it is moved to an Azure instance
  - Mitigation: Start with a simple RESTful API for basic interaction
- User Login Management
  - Description: Need to develop user login for the web app and allow users to modify the blockchain with Hyperledger Composer Identities
  - Mitigation: Make login management a top priority; use Composer tutorials

Questions?