

MICHIGAN STATE

U N I V E R S I T Y

Project Plan

LIMElight: Life Insurance Made Easy

The Capstone Experience

Team USAA

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

Functional Specifications

- Generate accurate life insurance quote using machine learning
- Improve experience of receiving a insurance quote by creating a responsive mobile-friendly web application
- Demonstrate practicality of storing and accessing health record data on a blockchain for general underwriting purposes



Design Specifications

- Provide a web application for users to answer questions and receive a life insurance quote instantly
- Provide a separate web application to allow underwriters to query health record data via a Blockchain web API



Screen Mockup: Quoting Process

The screenshot shows a web browser window with the address bar containing `https://www.limelight.usaa.com/get-quote`. The page features the USAA logo and the tagline "We know what it means to serve®". A navigation bar includes links for "Get a Quote", "Manage Health Records", and "Admin". The main heading is "Get a Term Life Insurance Quote". The form includes radio buttons for gender (M selected), input fields for age (37), weight (180), and height (6' 1"), and radio buttons for smoking status (N selected) and exercise status (Y selected). A "GET A QUOTE" button is positioned at the bottom.

Get a Quote

USAA®
We know what it means to serve®

Get a Quote | Manage Health Records | Admin

Get a Term Life Insurance Quote

M F

Age 37

Weight 180

Height 6' 1"

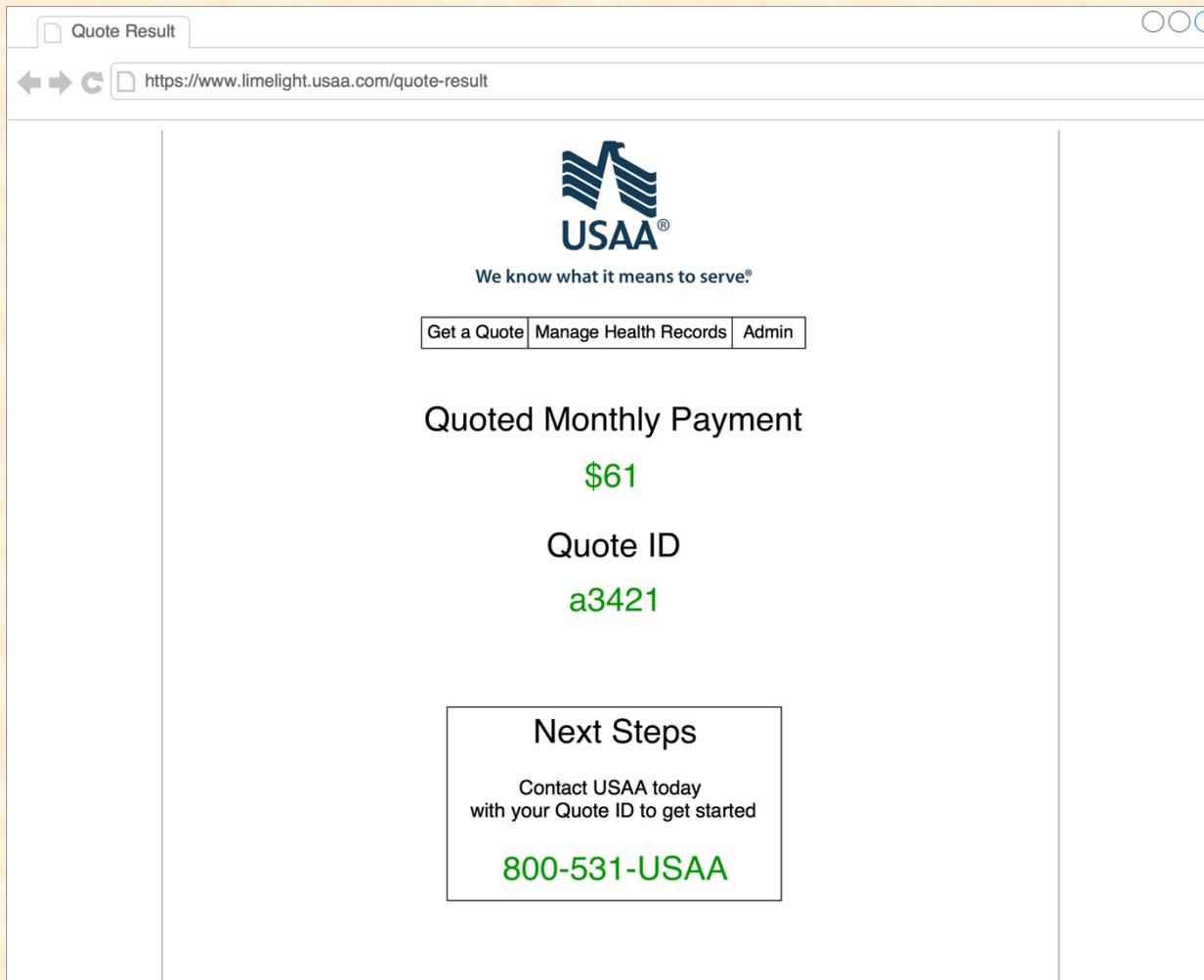
Do you smoke? Y N

Do you exercise? Y N

GET A QUOTE



Screen Mockup: Quoting Process



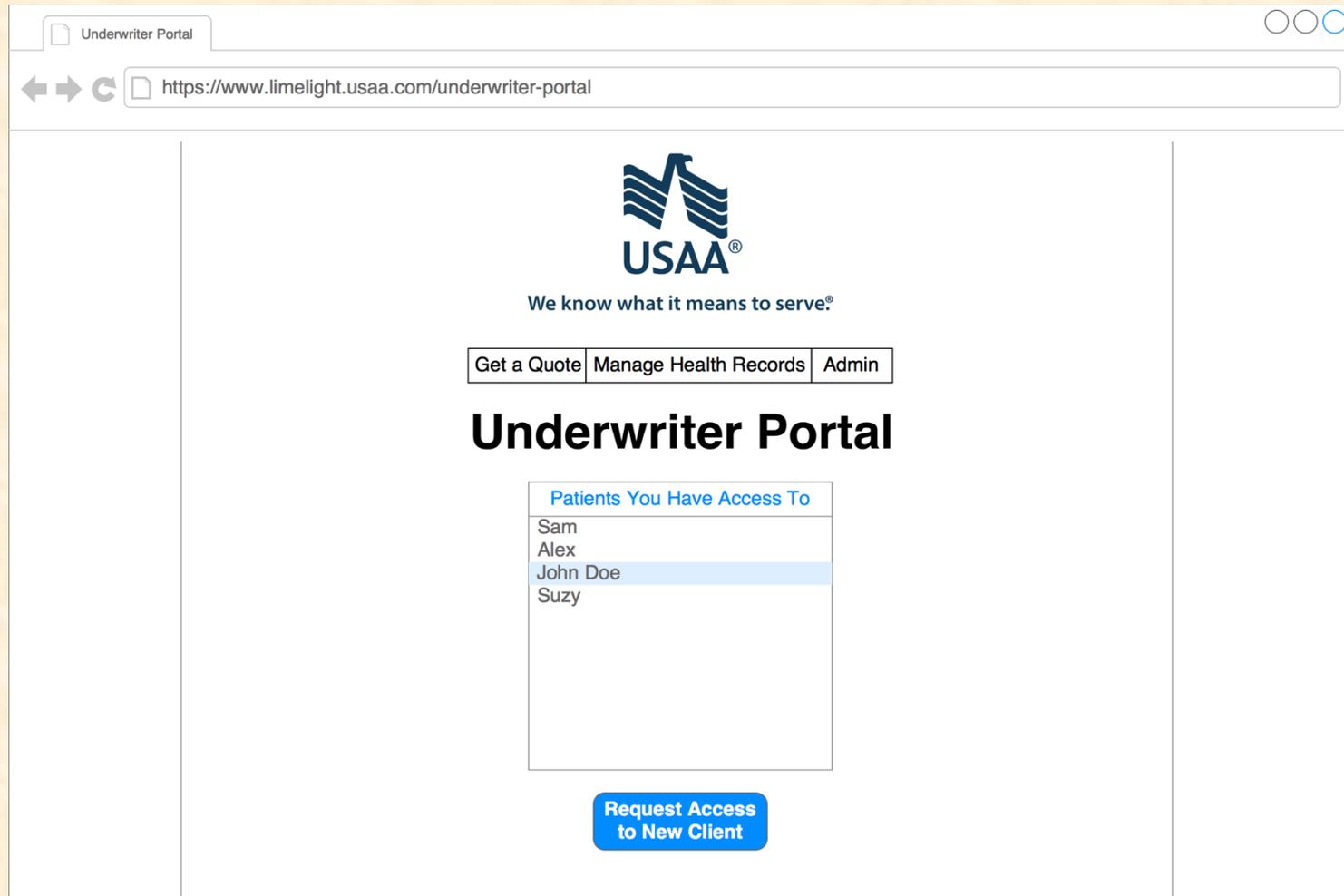
Screen Mockup: Underwriter Login

The screenshot shows a web browser window with the following elements:

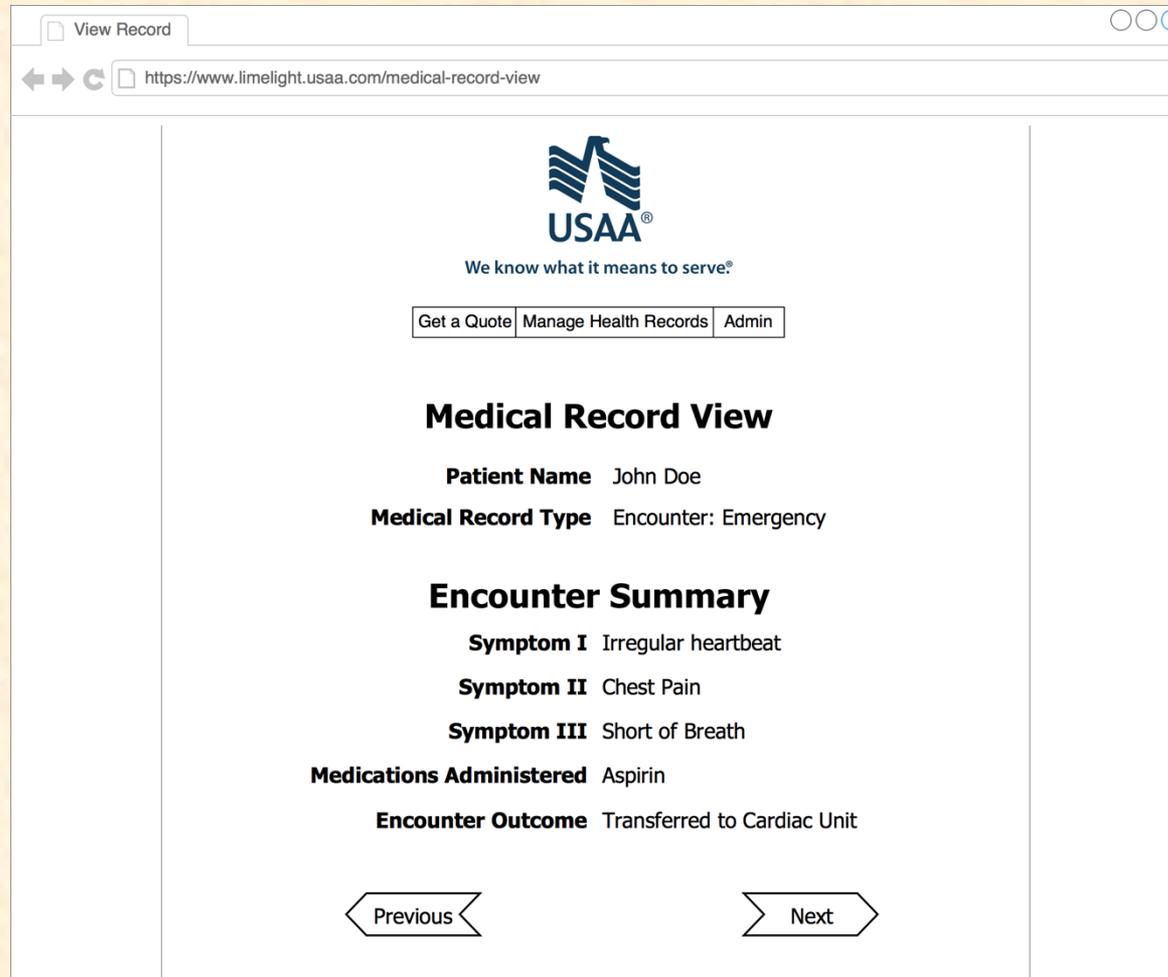
- Browser tab: Underwriter Portal
- Address bar: <https://www.limelight.usaa.com/underwriter-portal>
- USAA logo and tagline: "We know what it means to serve®"
- Navigation links: "Get a Quote", "Manage Health Records", "Admin"
- Section title: "Underwriter Portal"
- Form fields:
 - Username: Sally
 - Password: *****
- Login button: "Login"



Screen Mockup: Underwriter Patient Selection



Screen Mockup: Underwriter's Medical Record View



Screen Mockup: Patient Login

Patient Portal

https://www.limelight.usaa.com/patient-portal



We know what it means to serve®

[Get a Quote](#) [Manage Health Records](#) [Admin](#)

Patient Portal

Username

Password

Login



Screen Mockup: Patient Login

Record Mgt

https://www.limelight.usaa.com/manage-health-records



We know what it means to serve.®

[Get a Quote](#) [Manage Health Records](#) [Admin](#)

Manage Who Can View Your Health Records

Entity	Permission	
	Y	N
USAA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sparrow Health	<input type="checkbox"/>	<input checked="" type="checkbox"/>

[Update](#)

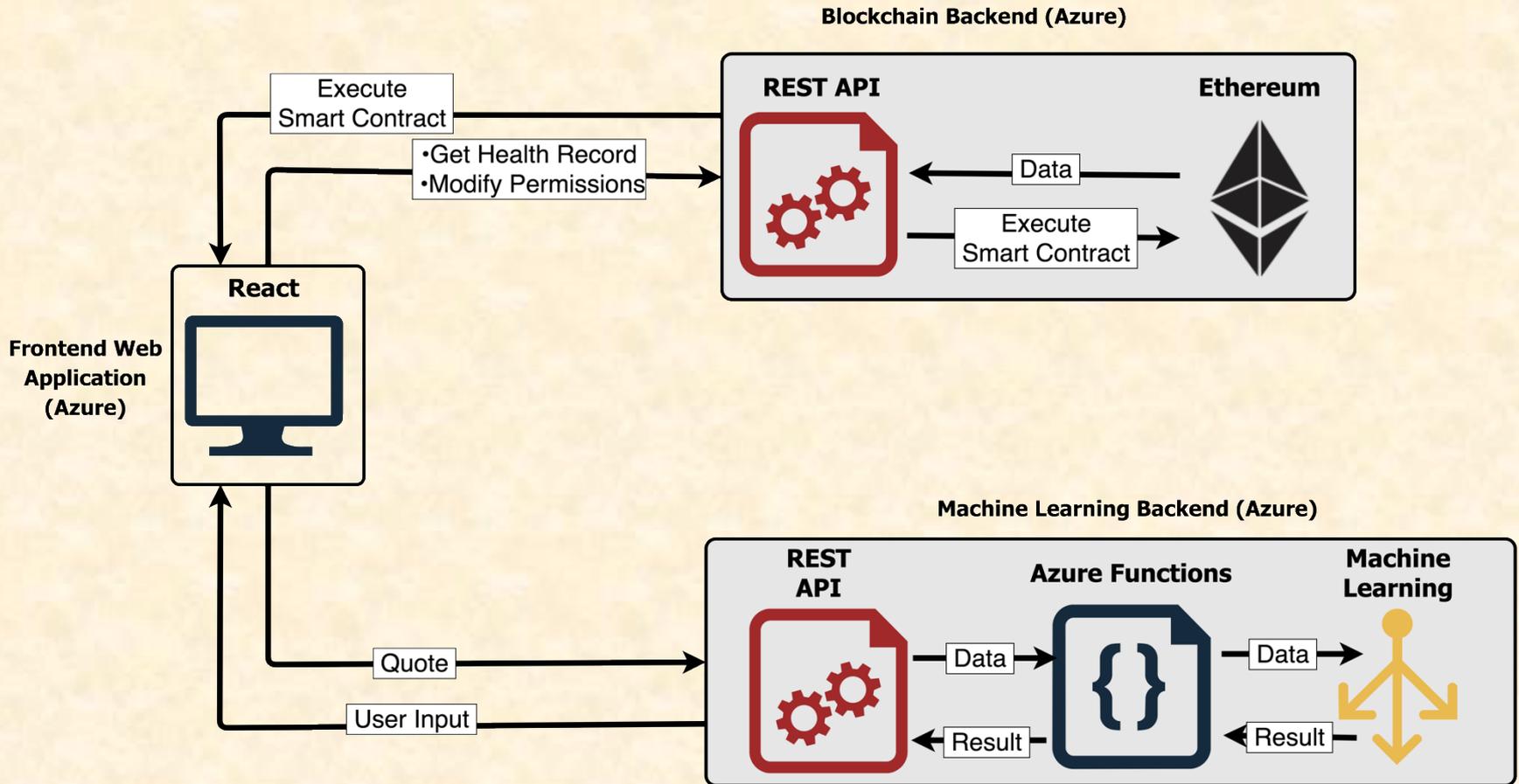


Technical Specifications

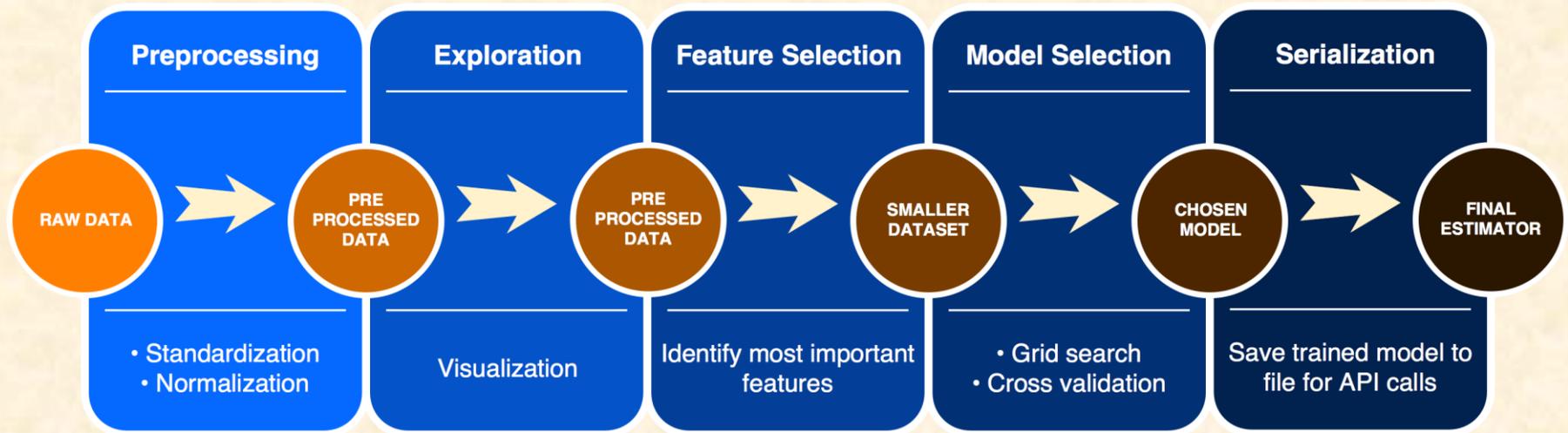
- Build the web application using React web framework.
- Use *Scikit-learn* to train and test insurance-quoting model.
- Construct *REST APIs* to expose the different services provided by the system.
- Build a simple blockchain that can be used to store and retrieve health record data while allowing users to set access permissions to their data.



System Architecture

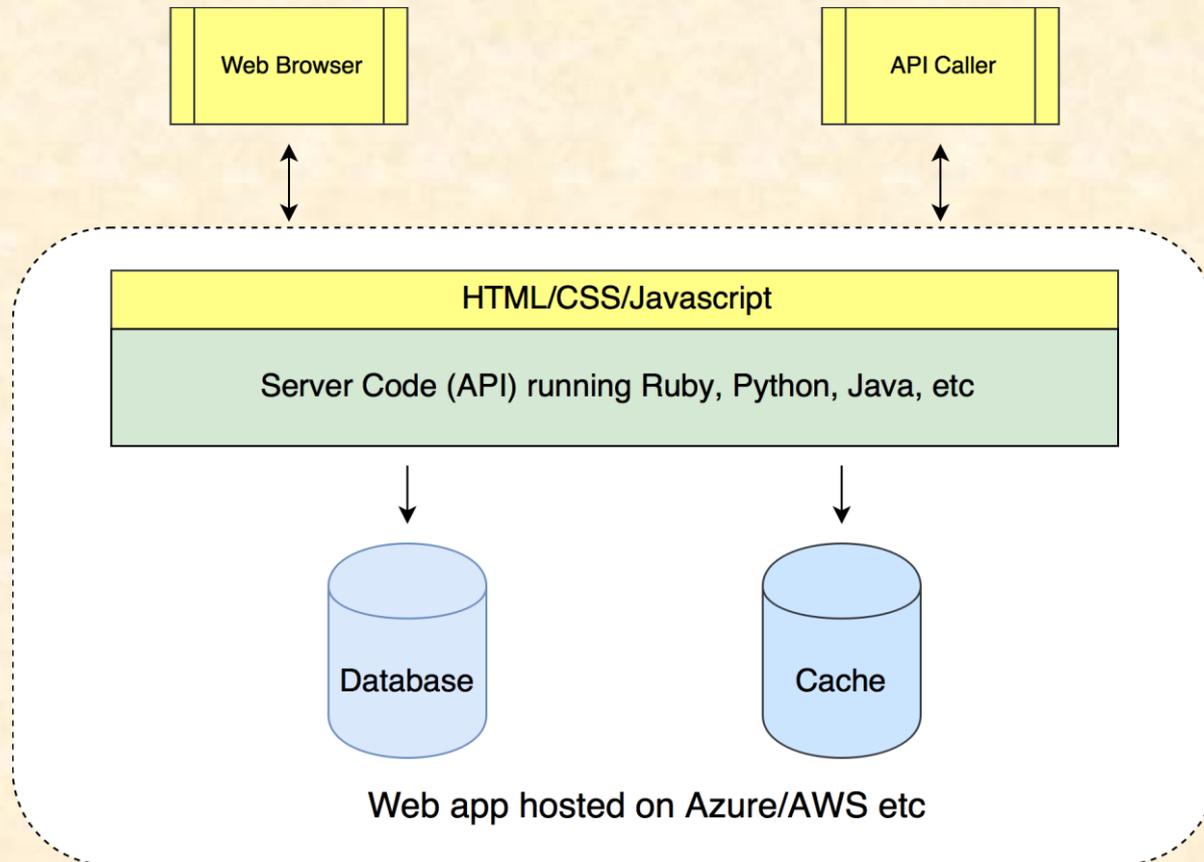


System Architecture: Machine Learning



Blockchain Crash-Course

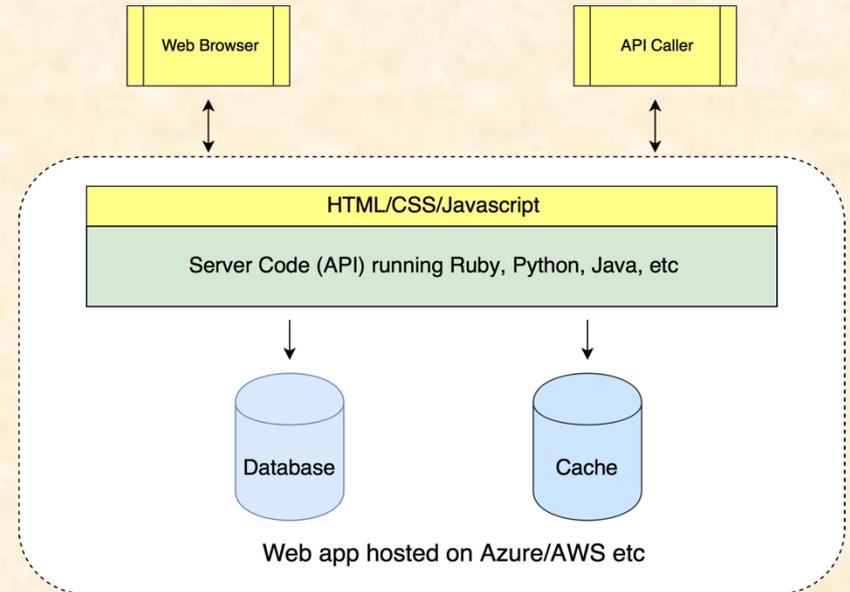
Traditional Web App Architecture



Blockchain Crash-Course

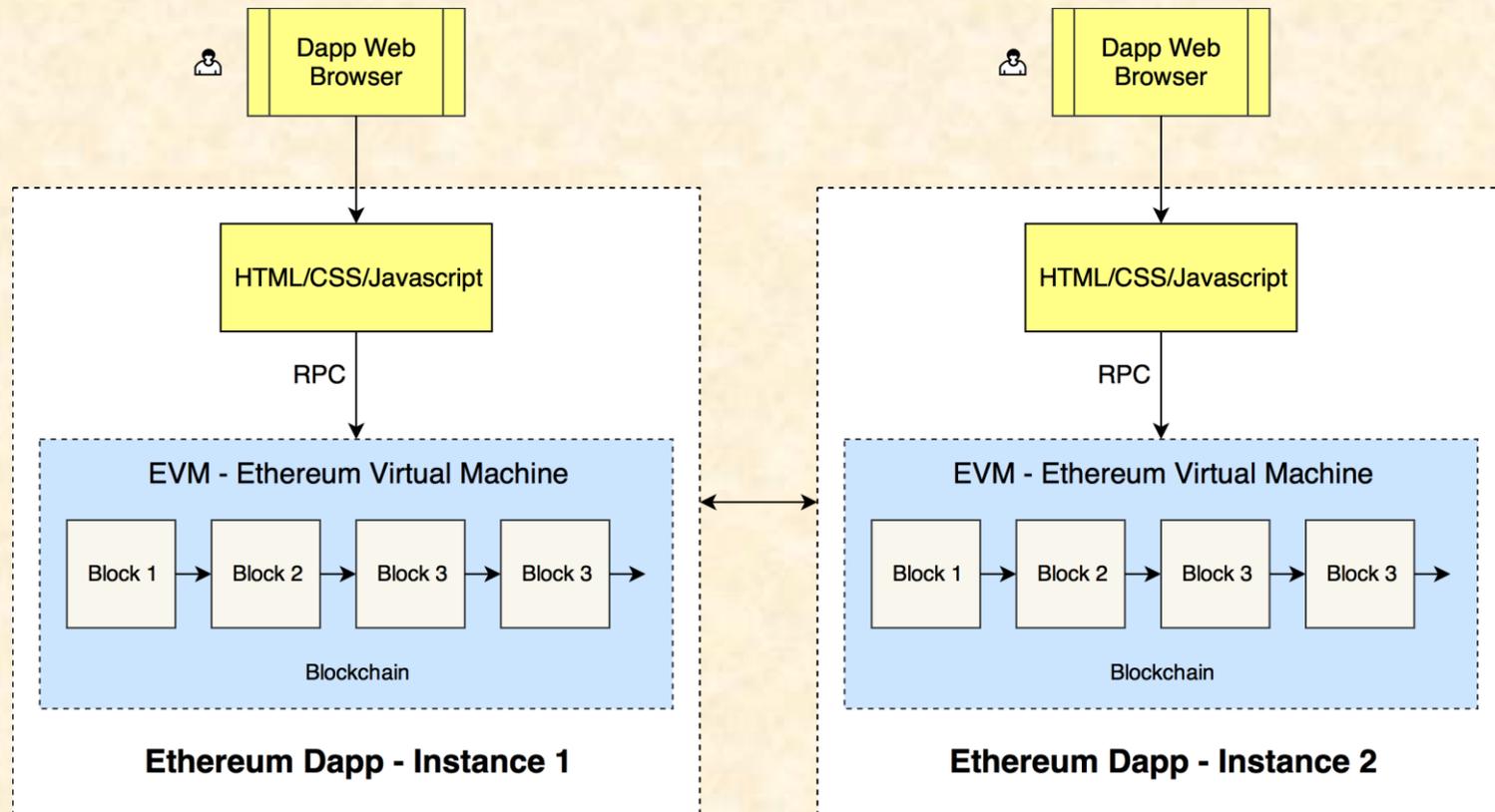
Storing Health Records: **Cons**

1. Centralized
2. Inaccessible
3. Single point of failure



Blockchain Crash-Course

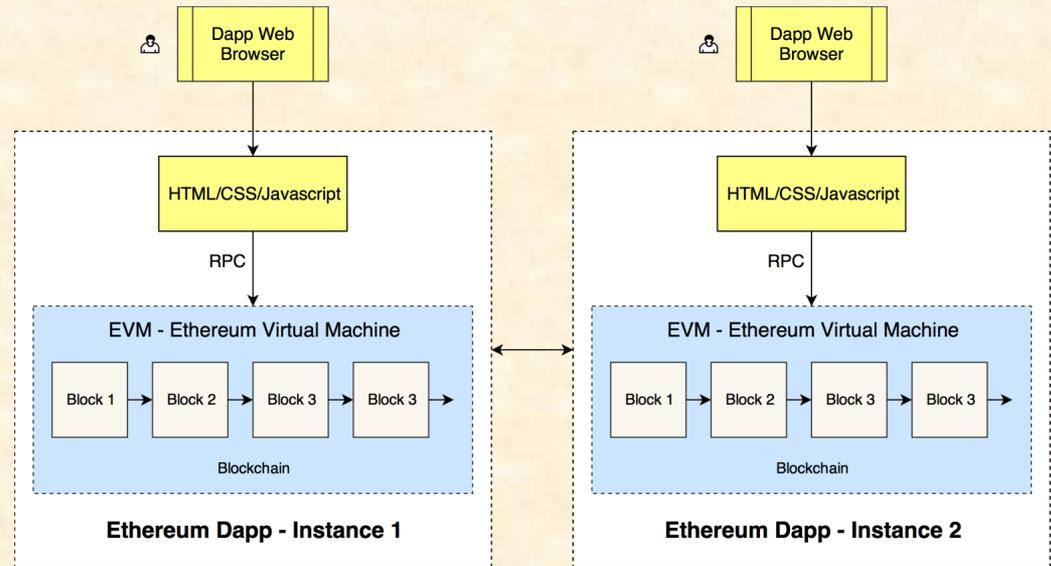
Ethereum Blockchain Web App Architecture



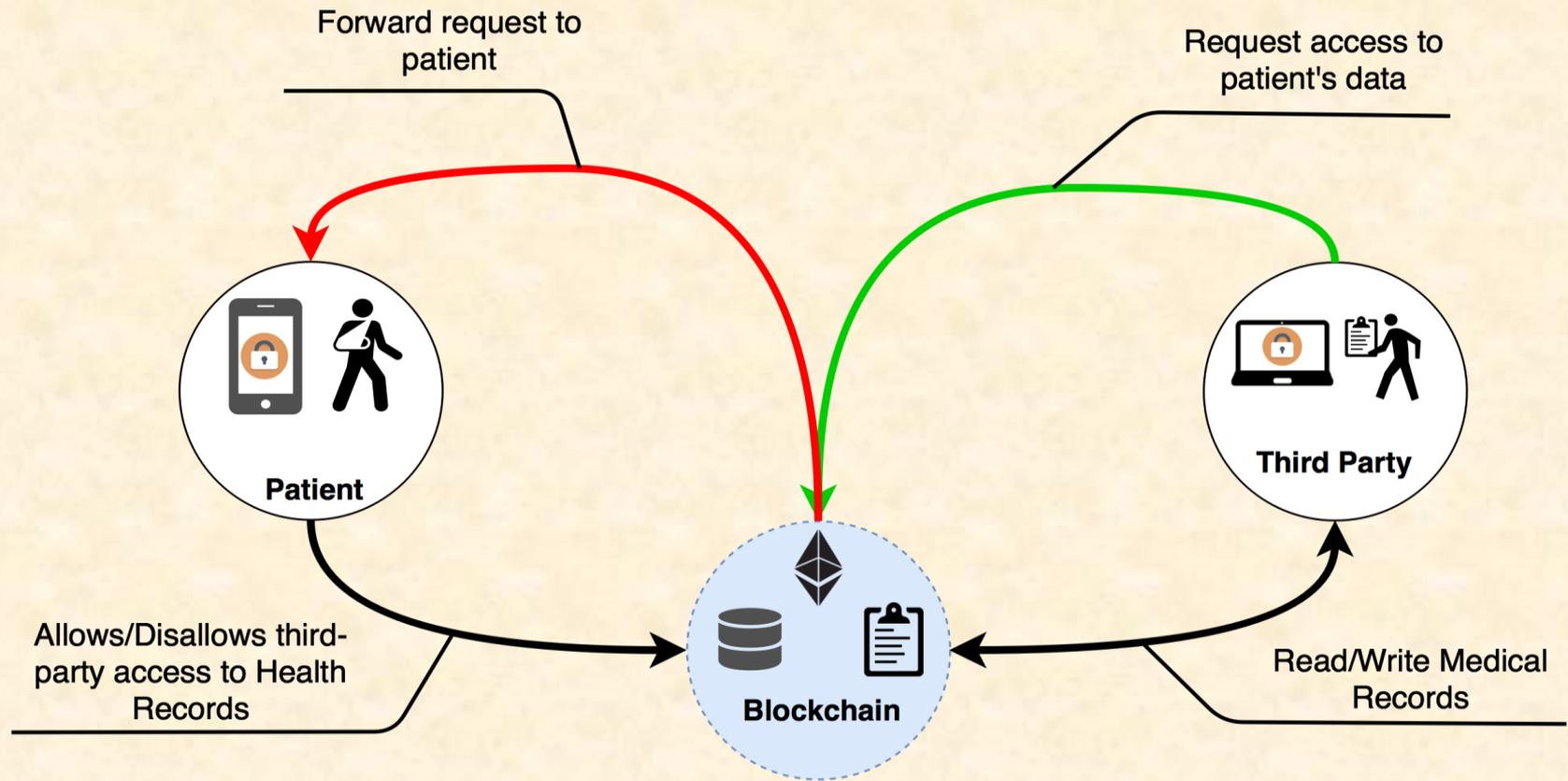
Blockchain Crash-Course

Storing Health Records: **Solutions**

1. Decentralized
2. Fully Accessible
3. Distributed



Blockchain Crash-Course



System Components

- Hardware Platforms
 - All hardware will be hosted on Microsoft Azure
- Software Platforms / Technologies
 - Python for Machine Learning
 - Scikit-learn, Pandas, Matplotlib
 - React for the web apps
 - JAX-RS for the REST APIs
 - Ethereum Consortium Blockchain
 - Microsoft Azure SQL Database



Risks

- Blockchain Implementation
 - Complexity of implementation using smart contract
 - Enrolled in Ethereum Udemy course, utilizing online Ethereum tutorials
- Accurate Life Insurance Quotes
 - Model may struggle to produce an accurate life insurance quote with minimal applicant input
 - Review academic research about most significant factors affecting an applicant's riskiness
- Lack of Knowledge in Life Insurance
 - Group does not have any experience with life insurance industry
 - Connect with underwriters and actuaries at USAA



Questions?

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