

**MICHIGAN STATE**  
**UNIVERSITY**

# Alpha Presentation

## Surge xOS: Visualization of Automated Underwriting

### The Capstone Experience

Team Surge Solutions

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

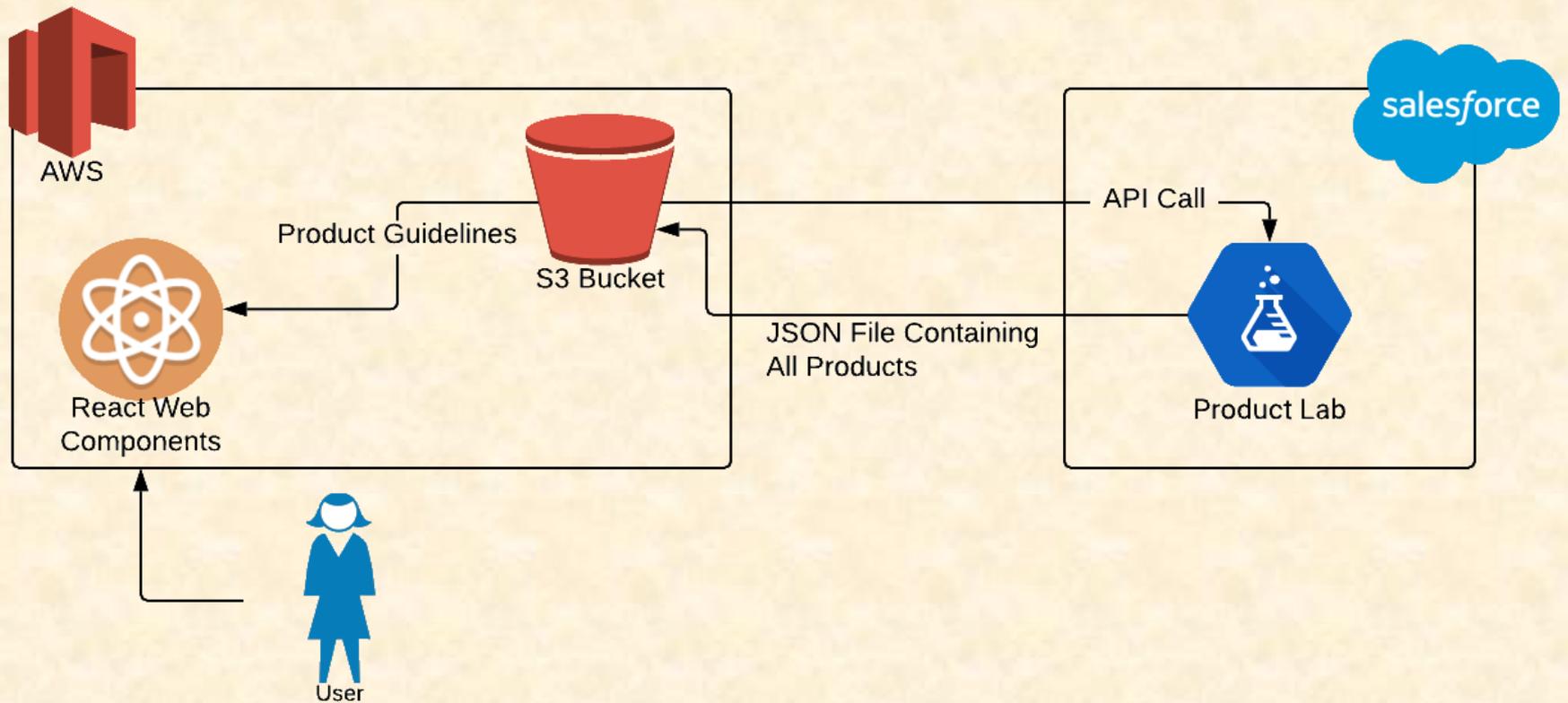
# Project Overview

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- Make Loan Underwriting Process Fast and Accurate
  - Recommend products directly to customers
  - Allow loan officers to easily view eligible products
- Enable Lenders to Visualize and Adjust Financial Products
  - How the risk and net benefit of a financial product changes as the product policy changes



# System Architecture



# Data Entry

Surge Solutions: Product Rec  
banksurge.com/productrecommendation

Product Recommendation

1

2 \* 1: What is your loan goal?

3  Purchase  Refinance  Equity  Reverse Mortgage

4

5

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7 \* 2: What type of property?

8  House  Townhome/Duplex  Townhome/Condominium  Multi-Family  Mobile

9

\* 3: What is your credit score?

Poor (300-500)  Fair (500-650)  Good (650-750)  Great (750-850)

\* 4: Which state do you reside in?

Michigan

\* 5: Are you or your spouse in the military?

Yes  No

\* 7: What is the purchase price of your property?

1,000,000

\* 8: How much are you putting for a down payment?

250,000

\* 9: What is your household annual income?

# Product Display

Surge Solutions: Product Rec  
banksurge.com/productrecommendation/rec

### Recommended Product

## 30-Year Fixed-Rate FHA



Interest Rate	4.375 %
APR	4.469 %
Monthly Payment	\$ 1136

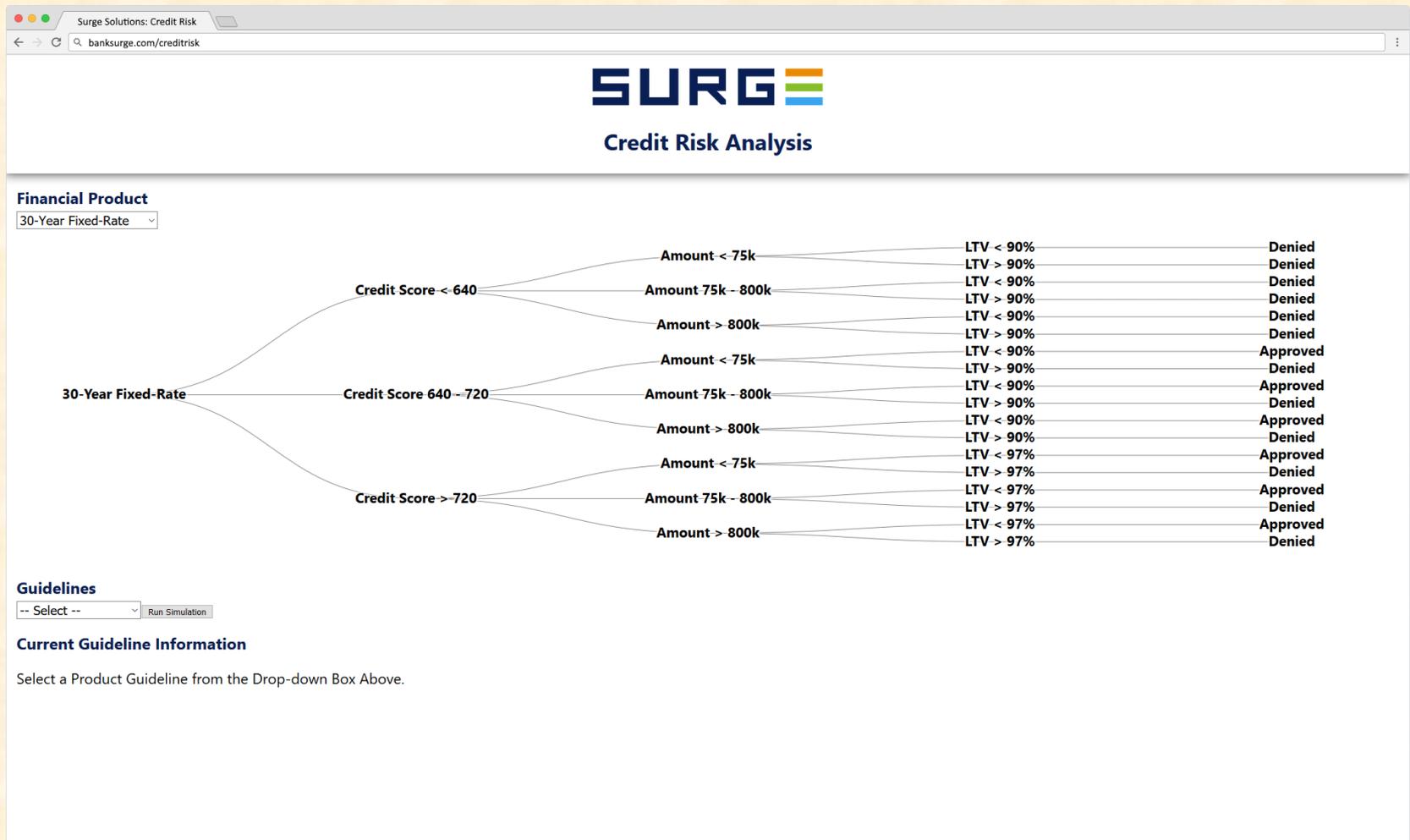
Rates are based on a \$300,000 home loan with 30% down.

### Alternative Products

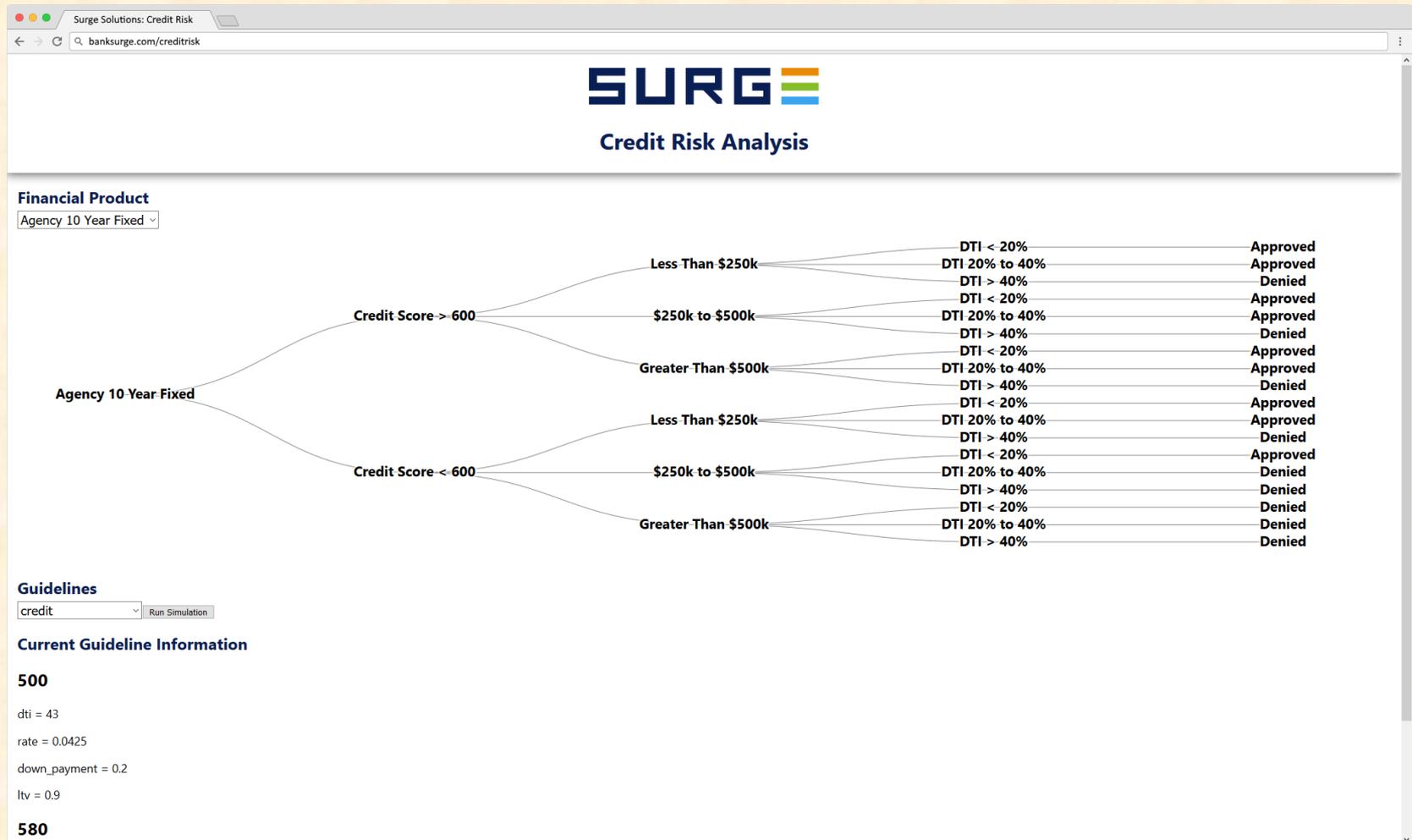
	<h4>30-Year Fixed-Rate</h4> <table><tr><td>Interest Rate</td><td>4.125 %</td></tr><tr><td>APR</td><td>4.474 %</td></tr><tr><td>Monthly Payment</td><td>\$ 1058</td></tr></table>	Interest Rate	4.125 %	APR	4.474 %	Monthly Payment	\$ 1058
Interest Rate	4.125 %						
APR	4.474 %						
Monthly Payment	\$ 1058						
	<h4>20-Year Fixed-Rate</h4> <table><tr><td>Interest Rate</td><td>4.25 %</td></tr><tr><td>APR</td><td>4.378 %</td></tr><tr><td>Monthly Payment</td><td>\$ 1698</td></tr></table>	Interest Rate	4.25 %	APR	4.378 %	Monthly Payment	\$ 1698
Interest Rate	4.25 %						
APR	4.378 %						
Monthly Payment	\$ 1698						



# Credit Risk Visualization



# Credit Risk Analysis



# What's left to do?

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- Monte Carlo Simulation
- Choose Risk Metrics
- Develop algorithm to recommend eligible products
- Add Implementation for Two Other Loan Types
- Integrate AWS Backend into App



# Questions?

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