

# Increase the security of digital online transactions

## 24hr hackathon



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# INTRODUCTION

With the increase of digital online transactions, security has become a top priority for individuals and organizations alike.

The question is "**How might we increase the security of these transactions through innovative digital solutions with accessibility in mind.**"

Our data team reviewed the data sets and saw a growth in popularity in regards to bitcoin, ethereum and decentralized banking which presents with it different authentication measures in relation to Mastercard. This sparked the idea "**How can we apply popular authentication methods that apply to cryptocurrencies and apply them through the mastercard model to bring a layer of security which is growing in popularity?**"

The result of this was the decision to design and develop an app which utilizes the methodology of blockchain in order to create an extra layer of authentication and security for our users.



## Important considerations

Identity is integral to a functioning society and economy.

Having a proper way to identify ourselves and our possessions enables us to create thriving societies and global markets. At its most basic level, identity is a collection of claims about a person, place or thing.

For people, this usually consists of first and last name, date of birth, nationality, and some form of a national identifier such as passport number, social security number (SSN), driving license, etc.

**Approximately 1.1 billion people worldwide don't have a way to claim ownership over their identity.** This leaves one-seventh of the world's population in a vulnerable state – unable to vote in elections, own property, open a bank account, or find employment

Without possessing physical identities, one cannot enroll in school, apply for jobs, get a passport, or access many governmental services. Having an identity is crucial to gaining access to the existing financial system.



# PROBLEM SPACE

**With the increase of digital online transactions, security has become a top priority for all organizations.**



# HOW MIGHT WE

**How might we increase the  
security of these transactions  
through innovative digital  
solutions accommodating all kinds  
of users?**



## **Why do we need Blockchain for Identity?**

Blockchain identity management systems could be used to eradicate current identity issues such as

- Inaccessibility
- Data insecurity
- Fraudulent identities



## Grasping the Problem:

### User Accessibility and Sentiment Analysis

3M Messages from Popular Crypto - focused groups.

Gathered and Idea of how the volume of popular keywords changes over time.

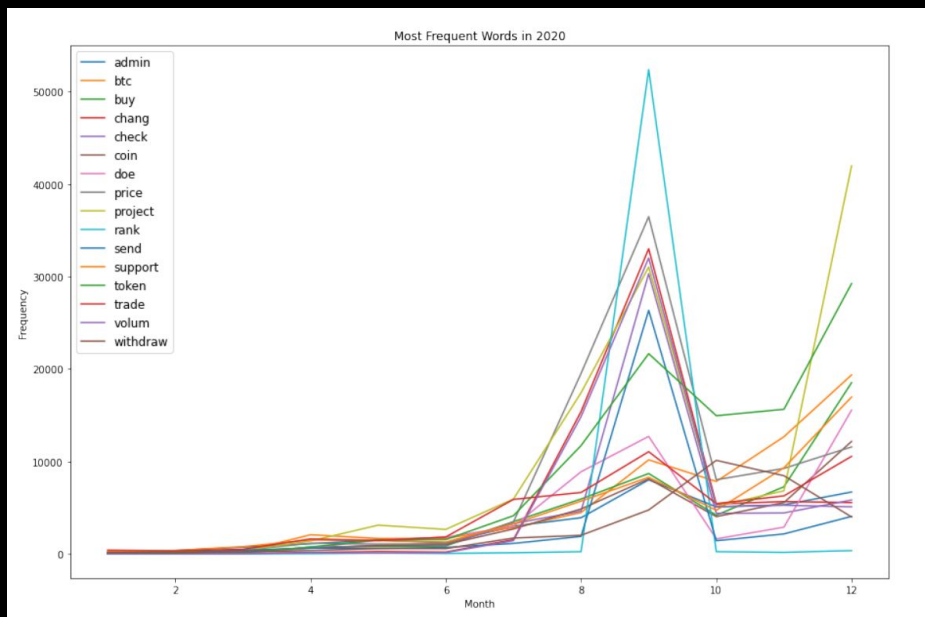
Based on these findings we identified key topical areas to group the most messages by.

From a Data perspective:

- We clean the data by identifying and removing unhelpful words.
  - Such as stop words and punctuation.
- We vectorize our clean data and combine it with time stamps.
- We then rank the by each word's frequency.
- And finally we also use some Topic Modeling to cluster words that are commonly used together.
- We use these clusters to identify common topics.



# The Full Picture

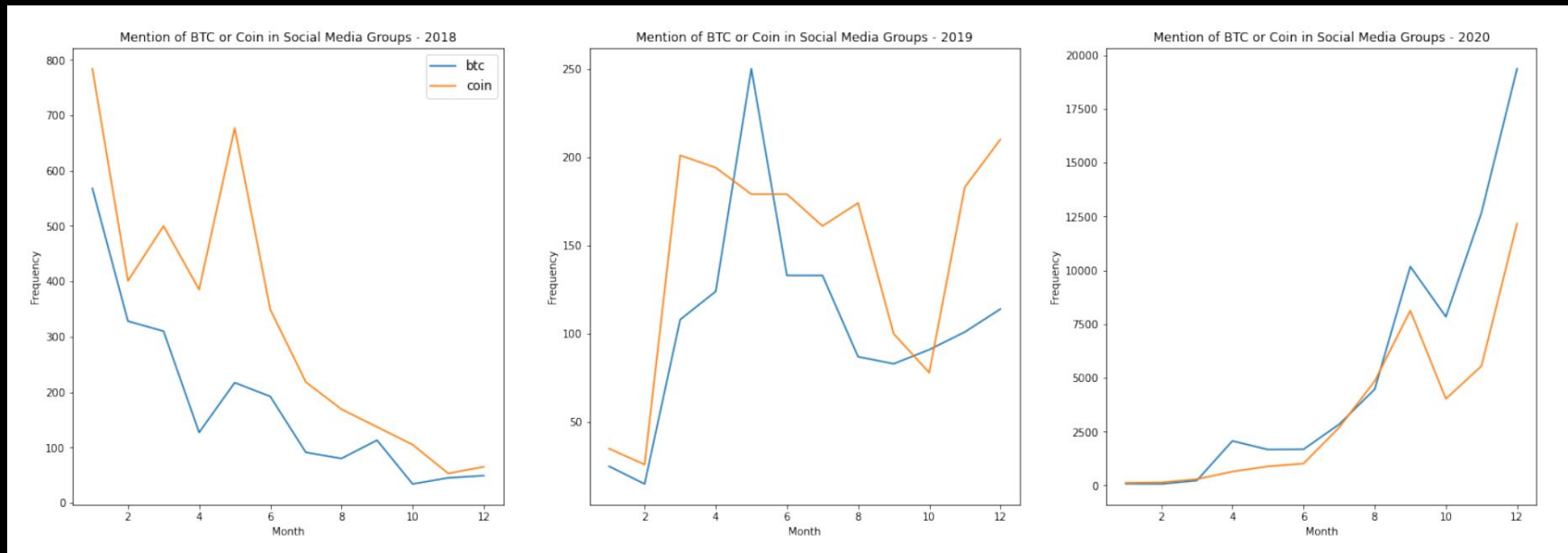


2020 Showing Record breaking Trends





# What About Crypto?



And it only keeps going up!



## Our Topic Clusters

Here we Identify 2 Common Groups:

- |  |   |
|--|---|
| ✓ eth kucoin okex team trading<br>support group users account does | ✓ btc know crypto account support<br>group binance don help right |
| ✓ check https community new send<br>com www support kucoin okex    | ✓ good xrp market trading know<br>crypto think buy price users    |
| ✓ price volume high low change<br>token binance help btc eth       | ✓ just like long users token new know<br>binance don time         |
| ✓ buy time admin token need don<br>help know right long            | ✓ hi huobi think defi right account<br>help need admin com        |
| ✓ project thank coin right community<br>token does long help new   | ✓ hello yes thanks does know admin<br>help need crypto defi       |

1 - Transactions and Trading  
2 - People Asking for Support

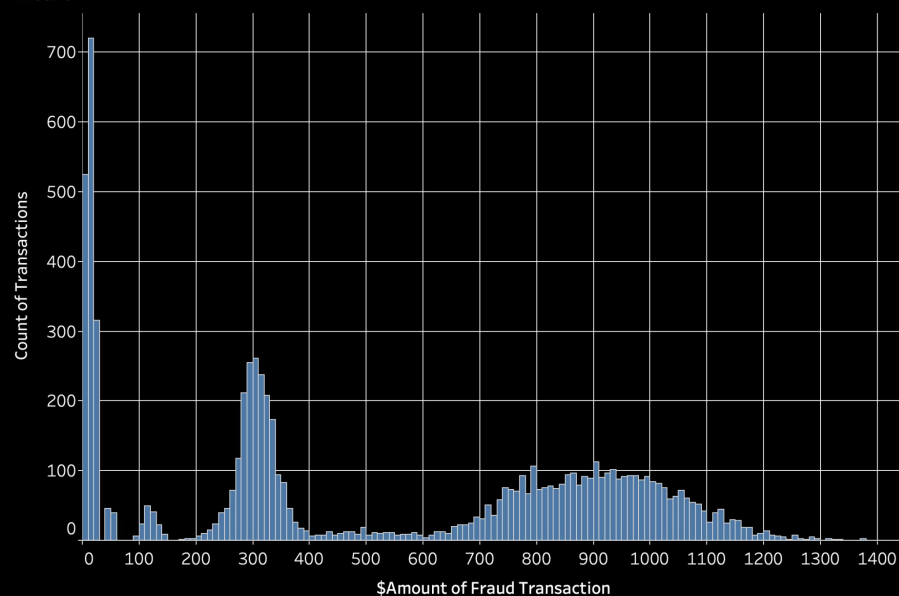


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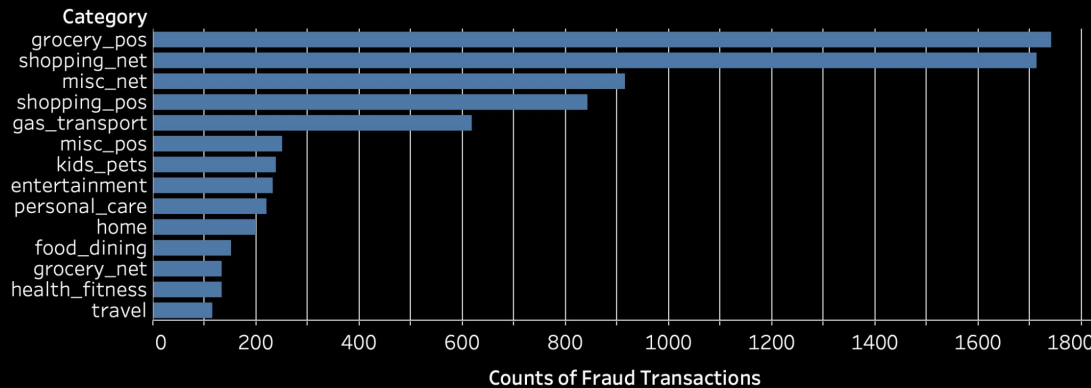
# Credit Card Transactions Fraud Detection

Credit card fraud happens when someone steals your credit card, credit card information or personal identification number (PIN) and uses it without your permission

Amount



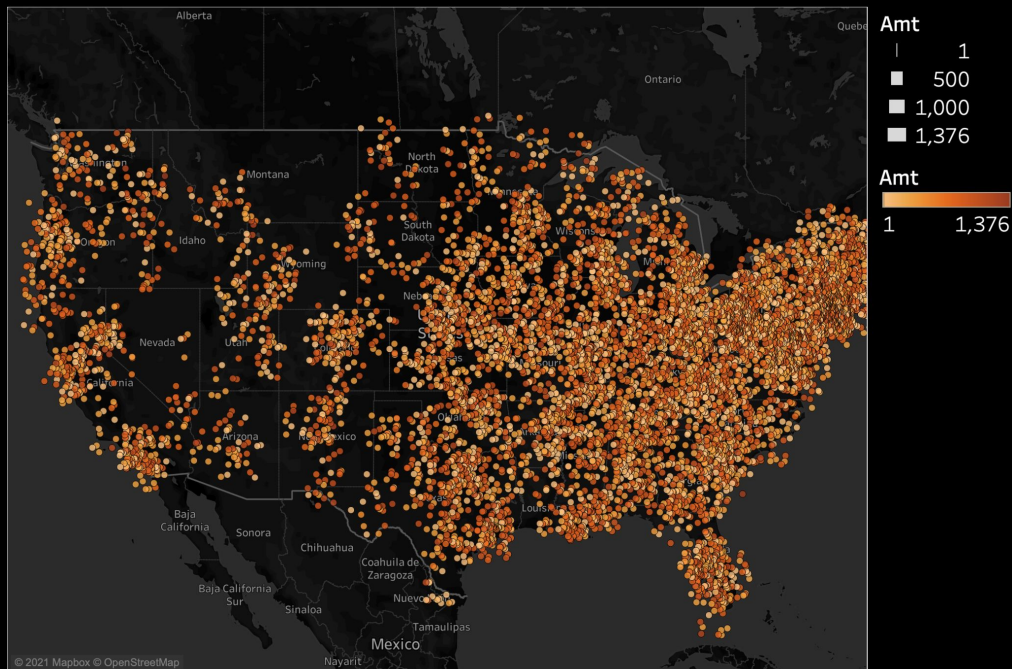
Category





# Credit Card Transactions Fraud Detection

Where Fraud Happens Most?



We built a fraud detector using AI to prevent your transactions fraud with 94.5% accuracy.



# Credit Card Transactions Fraud Detection

## In 24 Hours:

- Exploratory Data Analysis
- Feature Engineering
- Data Visualization
- Dealing with Imbalance
- Modelling
- Hyperparameter Optimization
- Model Evaluation



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# OUR SOLUTION



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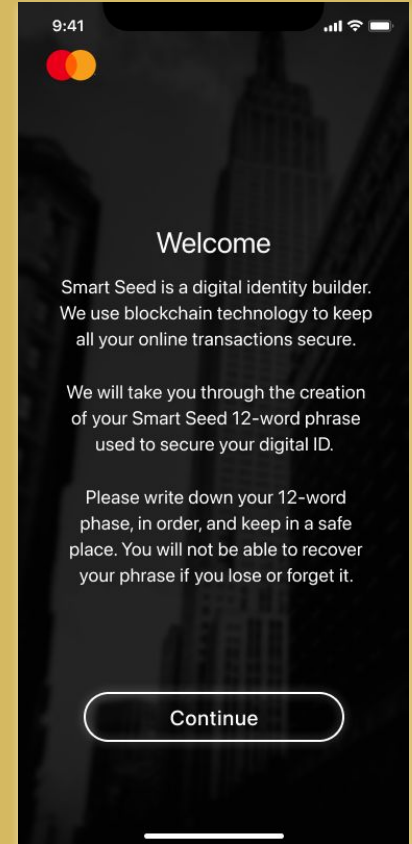
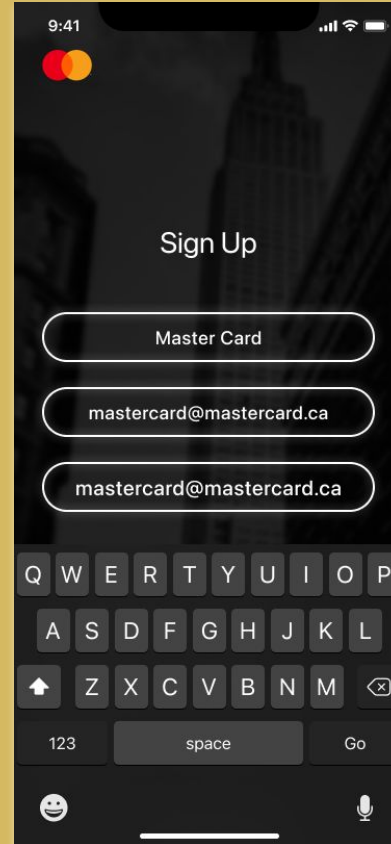
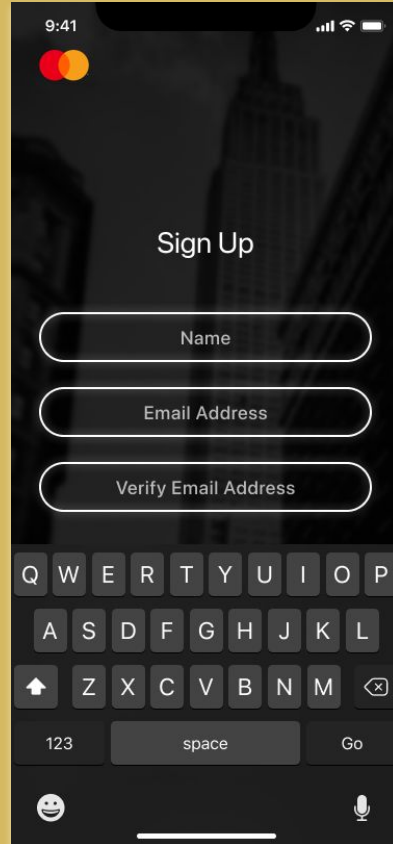
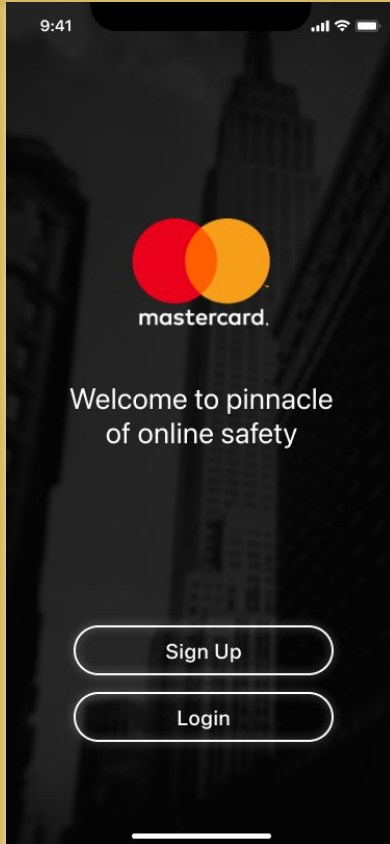
## **mastercard Smart Seed**

### Prototype

Understanding how decentralized ID's work and how important it is to keep your login safe is a concept not everyone understands, so we designed the onboarding process.

# Onboarding Flow

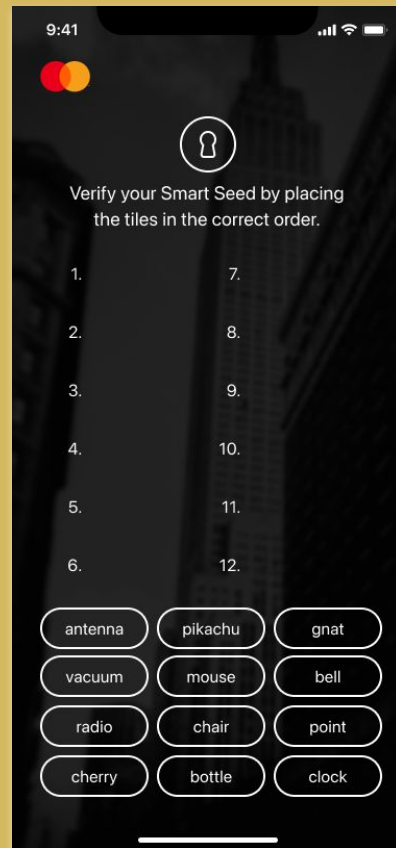
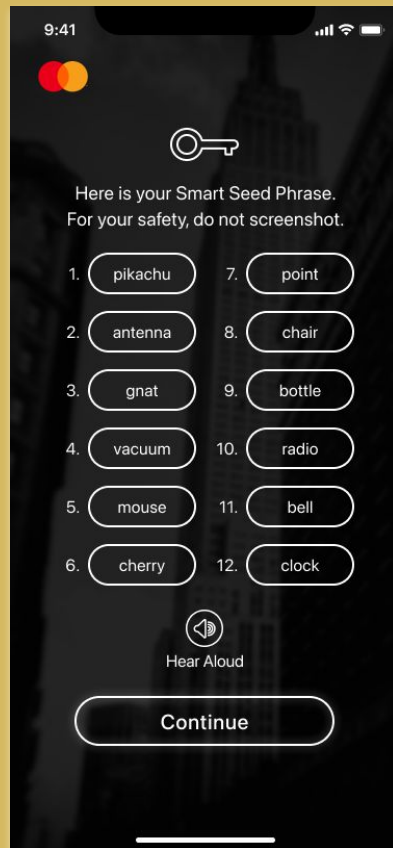
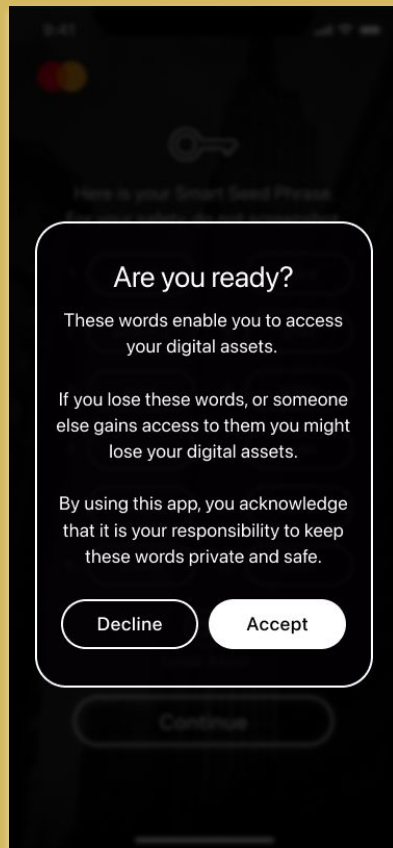
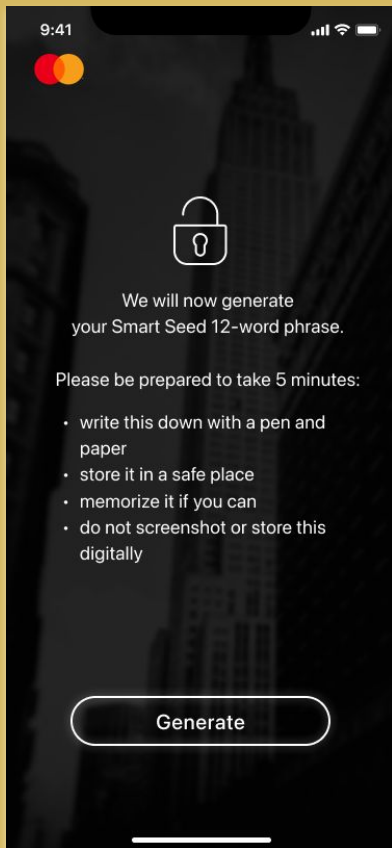
Prototype [link](#)





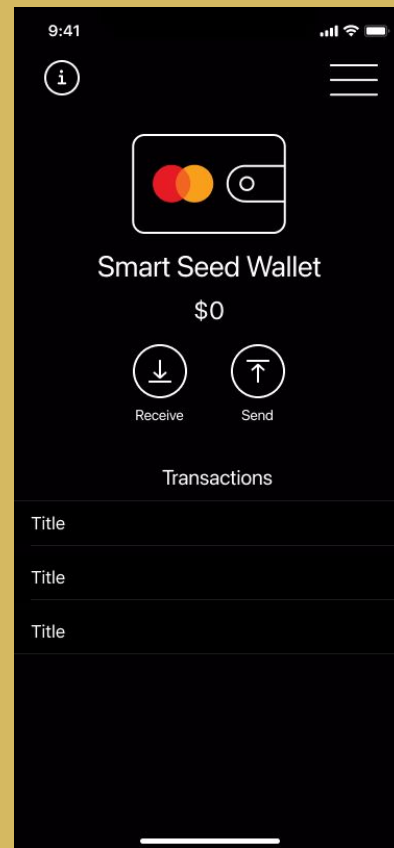
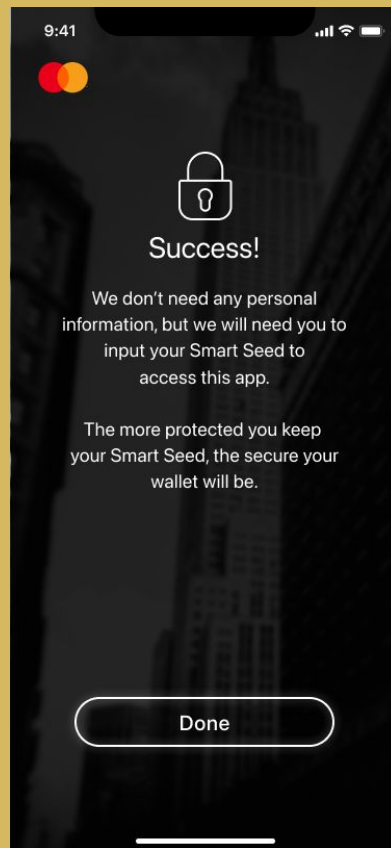
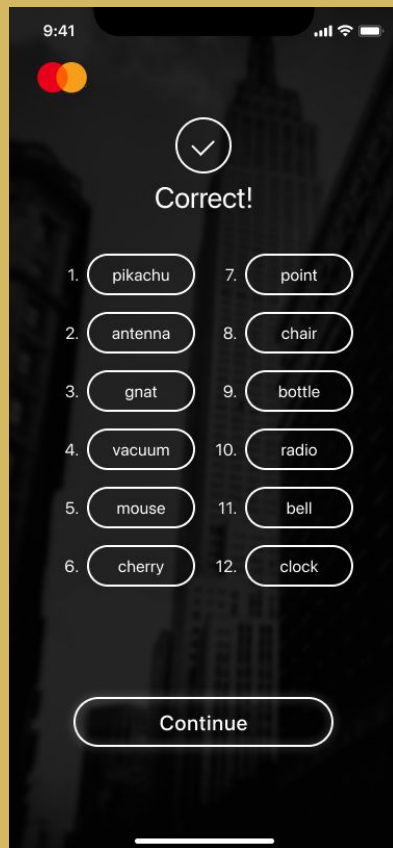
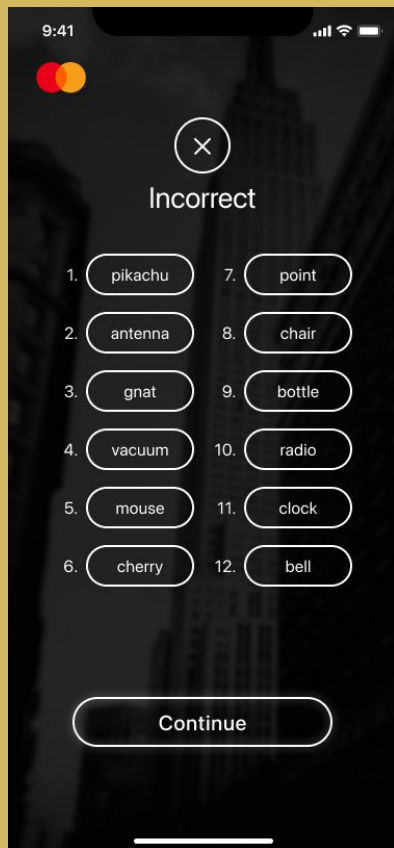
# Onboarding Flow

Prototype [link](#)



# Onboarding Flow

Prototype [link](#)





## ADA Compliance

### Color Contrast

**Decline**

**Accept**

We used a black-and-white color scheme both for accessibility and stylistic reasons, eliciting luxury and confidence in minimalism.

This color combo passes the WCAG contrast guidelines.

Ratio: 15.9 : 1



## ADA Compliance

### Scalability

Decline

Accept

To allow for scalability across different devices, we designed with an 8px soft grid system.



## ADA Compliance

### Touch Targets

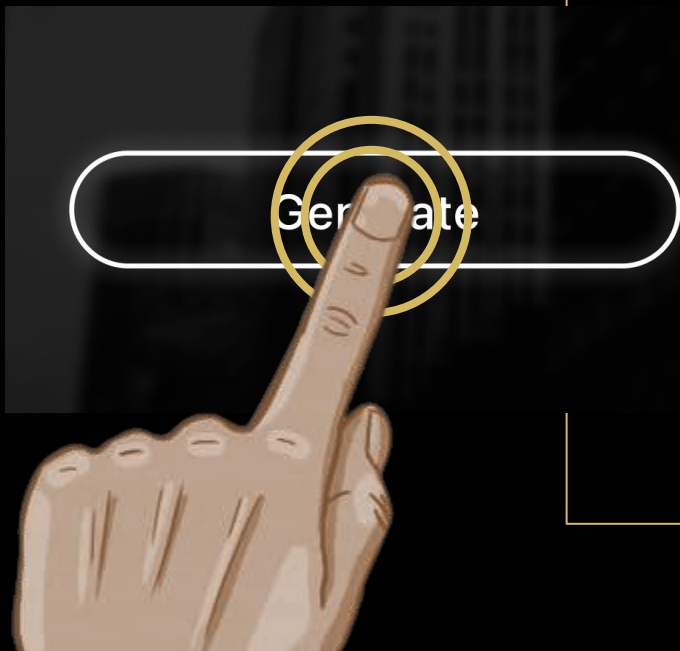
Generate

Buttons were given ample space so as not to crowd multiple touch targets together.



## ADA Compliance

### Haptic Feedback



Consideration was given to implementing haptic feedback on button presses for our hard-of-vision users.



## ADA Compliance



### Consistency

Screen layout maintained consistency across the onboarding flow with set margins on where content would appear.



## ADA Compliance

### Multiple Options



Hear Aloud

With the use of iOS' system keyboard, there is a built in speech-to-text option.

Additionally, during DID generation, we gave users the option to hear the Smart Seed aloud for hard-of-vision users.





## Additional Accessibility

### Help Resource



We realize grasping the concept of blockchain can be difficult, so we have placed an information button on the Home Screen to make sure people can get the help they need.



The App.js  
redirects to  
here if it's a  
new user

```
File Edit Selection View Go Run Terminal Help
GettingStarted.jsx - tilgner-aidan-industryproject - Visual Studio Code

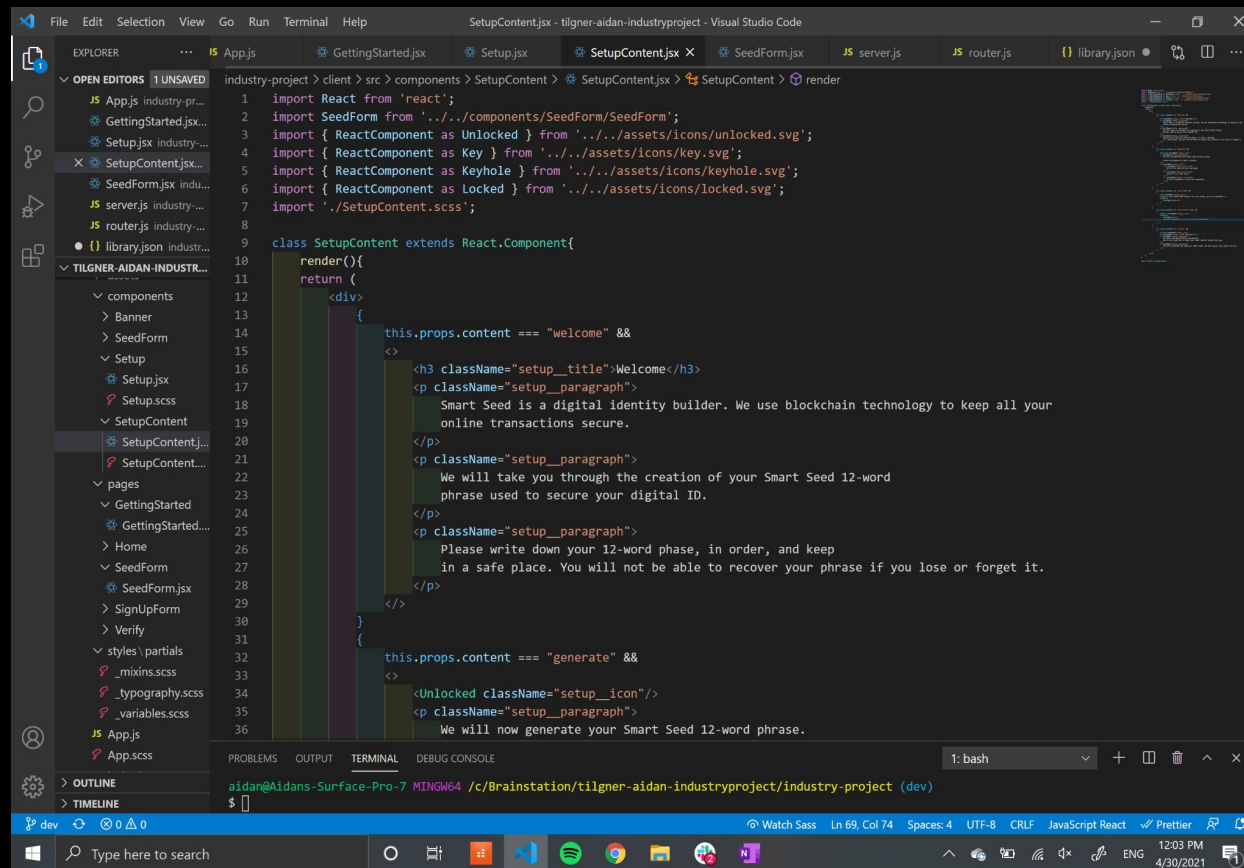
EXPLORER
  JS App.js industry-pr...
  X GettingStarted.jsx...
  Setup.jsx industry-...
  SetupContent.jsx...
  SeedForm.jsx indu...
  JS server.js industry-...
  JS router.js industry-...
  {} library.json industr...
  TILGNER-AIDAN-INDUSTR...
    components
    Banner
    SeedForm
    Setup
      Setup.jsx
      Setup.scss
    SetupContent
      SetupContent.j...
      SetupContent...
    pages
      GettingStarted
      GettingStarted...
      Home
      SeedForm
      SeedForm.jsx
      SignUpForm
      Verify
    styles \ partials
      _mixins.scss
      _typography.scss
      _variables.scss
    JS App.js
    App.scss

  industry-project > client > src > pages > GettingStarted > GettingStarted.jsx > GettingStarted > render

6 state={
7   page: 'welcome',
8 }
9
10 clickHandler = (nextPage) => {
11   this.setState({
12     page: nextPage,
13   })
14 }
15
16 render(){
17   return (
18     <div className="getting-started">
19       {
20         this.state.page === 'welcome' &&
21         <Setup
22           content="welcome"
23           buttonContent="Continue"
24           clickHandler={this.clickHandler}
25           nextPage="generate"
26         />
27       }
28     )
29   {
30     this.state.page === "generate" &&
31     <Setup
32       content="generate"
33       buttonContent="Generate"
34       clickHandler={this.clickHandler}
35       nextPage="smart-seed"
36     />
37   }
38   {
39     this.state.page === "smart-seed" &&
40     <Setup
41       content="smart-seed"
42       buttonContent="Continue"
43     />
44   }
45 }
46
47 PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
aidan@Aidans-Surface-Pro-7 MINGW64 /c/Brainstation/tilgner-aidan-industryproject/industry-project (dev)
$
1: bash
```



This is where the content for each part of the onboarding is rendered



```
1 import React from 'react';
2 import SeedForm from '../components/SeedForm/SeedForm';
3 import { ReactComponent as Unlocked } from '../assets/icons/unlocked.svg';
4 import { ReactComponent as Key } from '../assets/icons/key.svg';
5 import { ReactComponent as Keyhole } from '../assets/icons/keyhole.svg';
6 import { ReactComponent as Locked } from '../assets/icons/locked.svg';
7 import './SetupContent.scss';
8
9 class SetupContent extends React.Component{
10
11   render(){
12     return (
13       <div>
14         {this.props.content === "welcome" &&
15         <>
16           <h3 className="setup_title">Welcome</h3>
17           <p className="setup_paragraph">
18             Smart Seed is a digital identity builder. We use blockchain technology to keep all your
19             online transactions secure.
20           </p>
21           <p className="setup_paragraph">
22             We will take you through the creation of your Smart Seed 12-word
23             phrase used to secure your digital ID.
24           </p>
25           <p className="setup_paragraph">
26             Please write down your 12-word phase, in order, and keep
27             in a safe place. You will not be able to recover your phrase if you lose or forget it.
28           </p>
29         </>
30       )
31     }
32     {this.props.content === "generate" &&
33     <>
34       <Unlocked className="setup_icon">
35       <p className="setup_paragraph">
36         We will now generate your Smart Seed 12-word phrase.
```



This is where  
we handle  
server traffic  
and direct it  
accordingly

```
File Edit Selection View Go Run Terminal Help
serverjs - tilgner-aidan-industryproject - Visual Studio Code

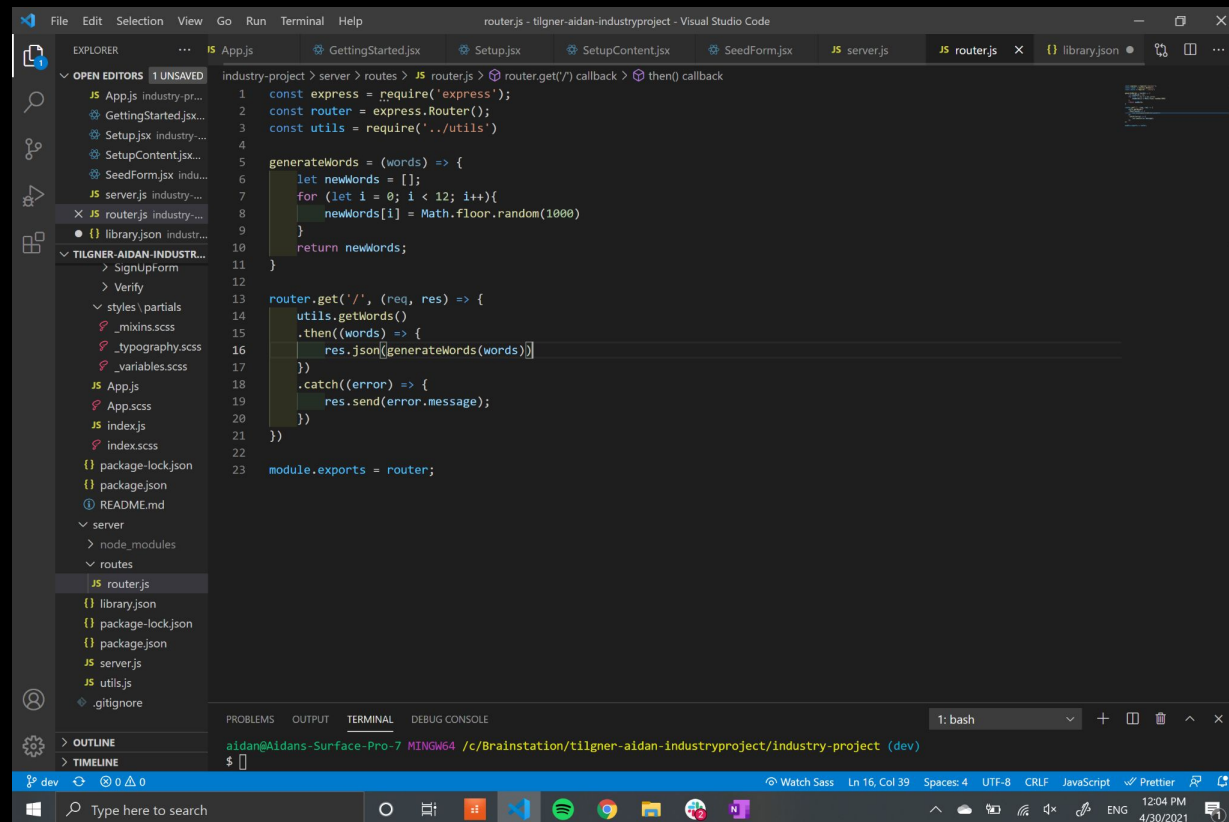
EXPLORER
1 UNSAVED
  industry-project > server > JS serverjs > ...
  JS App.js industry-pr...
  GettingStarted.jsx...
  Setup.jsx industry-...
  SetupContent.jsx...
  SeedForm.jsx indu...
  X JS serverjs industry-...
  JS routerjs industry-...
  {} library.json indu...
  TILGNER-AIDAN-INDUSTR...
  > SignUpForm
  > Verify
  > styles \partials
  _mixins.scss
  _typography.scss
  _variables.scss
  JS App.js
  App.scss
  JS index.js
  index.scss
  {} package-lock.json
  {} package.json
  {} README.md
  > server
  > node_modules
  > routes
  JS routerjs
  {} library.json
  {} package-lock.json
  {} package.json
  JS serverjs
  JS utils.js
  .gitignore

OUTLINE
TIMELINE

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
1: bash
aidan@Aidans-Surface-Pro-7 MINGW64 /c/Brainstation/tilgner-aidan-industryproject/industry-project (dev)
$
```

```
1 const express = require('express');
2 const app = express();
3 const cors = require('cors');
4 const router = require('./routes/router')
5
6 const PORT = 8080;
7
8 app.use(cors());
9 app.use(express.json());
10
11 app.use('/words', router);
12
13 app.listen(PORT, () => {console.log(`Listening on port ${PORT}`)})
```

This is where the seed is generated from a library of a thousand words

A screenshot of the Visual Studio Code editor interface. The Explorer sidebar on the left shows a project structure with files like App.js, GettingStarted.jsx, Setup.jsx, SetupContent.jsx, SeedForm.jsx, server.js, and router.js. The router.js file is open in the editor, showing a Node.js Express.js router. The code includes imports for express, Router, and a local utils module. It defines a generateWords function that returns an array of random words and a GET route that uses this function to generate words for a response. The terminal at the bottom shows a bash prompt and the current directory path. The status bar at the very bottom indicates the file is in UTF-8 encoding with CRLF line endings, and the Prettier formatter is active.

```
1 const express = require('express');
2 const router = express.Router();
3 const utils = require('../utils')
4
5 generateWords = (words) => {
6   let newWords = [];
7   for (let i = 0; i < 12; i++){
8     newWords[i] = Math.floor.random(1000)
9   }
10  return newWords;
11 }
12
13 router.get('/', (req, res) => {
14   utils.getWords()
15   .then((words) => {
16     res.json([generateWords(words)])
17   })
18   .catch((error) => {
19     res.send(error.message);
20   })
21 })
22
23 module.exports = router;
```



This is where the library is stored, notice we added some pokemon

The screenshot shows the Visual Studio Code interface with the following details:

- Explorer:** The file tree on the left shows the project structure. The file `library.json` is selected under the `server` directory.
- Editor:** The main editor displays the content of `library.json`, which is an array of 36 Pokémon names:

```
1  []  
2  "ability",  
3  "abra",  
4  "about",  
5  "above",  
6  "alakazam",  
7  "according",  
8  "account",  
9  "across",  
10 "act",  
11 "action",  
12 "aerodactyl",  
13 "actually",  
14 "add",  
15 "address",  
16 "administration",  
17 "admit",  
18 "absol",  
19 "affect",  
20 "after",  
21 "again",  
22 "against",  
23 "age",  
24 "agency",  
25 "agent",  
26 "ago",  
27 "agree",  
28 "agreement",  
29 "ahead",  
30 "air",  
31 "all",  
32 "allow",  
33 "almost",  
34 "alone",  
35 "along",  
36 "already",
```
- Terminal:** The bottom terminal shows the command prompt with the current directory set to the project folder:

```
aidan@Aidans-Surface-Pro-7 MINGW64 /c/Brainstation/tilgner-aidan-industryproject/industry-project (dev)  
$
```



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**Thank You,  
And we hope you enjoyed**



**mastercard Smart Seed**



**A Digisec Project**