# Project Proposal: Shark Tank Assistant

**Version 1.0 approved**

**Leann Blanc, Colin Chenoweth, Aditi Mukkara, Sahil Patel, & Mehlam Saifudeen**

**September 8, 2023**

# Table of Contents



# Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| Initial version | 9/5/23 | | 1.0 |

# 1. Background

## 1.1 Purpose and Audience

This project proposal explains the various requirements for the first release of the Shark Tank Assistant Application. The user base for this application is wide, primarily targeting sharks and applicants on Shark Tank. However, the user base can also include users of other shows such as Dragon's Den, a spinoff of Shark Tank in Canada and Poland, Money Tigers in Japan, and Tu Oportunidad (Your Chance) in Spain. The document was created to guide the development of the application with the goal being to develop each of the listed requirements. For the users, this document provides information on the functionality and usability of the application.

## 1.2 Product Scope

With entrepreneurial spirit rising around the world, fostering creativity and encouraging individuals in their aspirations is more important than ever. One such way is Shark Tank which provides seed funding for individual companies. Our application will allow for users to tailor their Shark Tank application based on their specific company and product details including but not limited to industry, size, and previous sales. Benefits of this app include allowing users to better obtain funding and valuation deals, instead of potentially less meaningful applications. In addition, our application can be used by sharks who are investing funds into the companies to see how their previous investments match up to new products being pitched.

# 2. Technical Project Requirements

## 2.1 Product Perspective and Goal

- Create a program that provides SharkTank contestants with feedback on their proposal and product, including but not limited to potentially revealing whether/which a shark will accept their offer, whether their product will succeed in the market.
- Utilize datasets and past episode transcripts to train the model.
- Have a user interface that is a pseudo Shark Tank application to get information on the product and proposal, and return useful feedback.
- Measure "usefulness" by comparing feedback to past proposals/product outcomes.

## 2.2 Product Functions

### 2.2.1 Front End

The first page will include graphs, tables, and other interactive visualizations to provide the user with information regarding previous Shark Tank contestants. For example, the user is able to select filters such as the industry they are interested in or the investor they are targeting. Accordingly, the

page will display information such as the average investment amount per investor per industry. This page will also include interactive elements such as pie charts and bar graphs.

The second page will include an application for the user to fill out. This application will include specific aspects of the actual 17 page Shark Tank application. Once the user submits the application, the program will tell them if their pitch will be successful or not on the Shark Tank show. Based on our progress, we hope to expand this so that the user can also receive feedback on which shark is most likely to invest in their idea or whether their original valuation is too high or too low.

### 2.2.2 Back End

*Feature Extraction:*
The goal is to create an application-like feature set. It will be easy to expand from simple facts about the proposal/product, to eventually include more complex data like the transcript of an episode or the description of a product/demonstration. We can also use NLP to extract useful features from the transcript or application text. We can either try to create our own metrics for relevance (such as highest frequency words or frequency of chosen buzz words) or use NLP libraries to help gather semantic meaning and transform that into a usable feature.

*Machine Learning Model(s):*
Either use one multi-class classification model or multiple single-class classification models. We can use something complex like support vector machines or neural networks (which could reduce the amount of the feature transformation required) or more simple classification models such as logistic regression. Depending on the complexity and difficulty of creating a single accurate/precise model, it may be feasible to also compare how well different models work for this problem.

## 2.3 Dataset

For general statistics regarding past Shark Tank investments we will use this open source dataset providing details on episodes. This dataset includes information from the contestant's application such as their original amount ask, the original equity ask, their gender, and their industry. It also includes information regarding how successful the contestant was on the show using measures such as whether or not they got the deal, how mean each investor invested, and the deal valuation.

Shark Tank US Dataset

For further information regarding rhetoric or negotiations after our developments with this data, we will look into other data sources such as Shark Tank show transcripts or data from other similar shows across the world.

# 3. Management Plan

## 3.1 Work to be Done

To start off we would like to obtain the episode transcripts and data such as product information, sales, valuation, final deal, and which shark invested, to use for the training data for the model. Before stepping into the model though, we plan to include interactive visualizations and graphs on the front end to give users an idea of which industry, products, product sales get the most amount of investments, along with which sharks tend to invest in a particular industry or product over others. This can provide the users with an overall idea of what to expect before filing in an application for Shark Tank or determining a valuation for their company.

Once we have this data we can use it to train the overall model in the form of an application with a backend and frontend which will be filtered for the needs of an individual user's company/product. This will be based on the entire Shark Tank application. This would give the user an idea of what to expect in terms of investment amount, valuation, and individual shark interest based on their current sales, product market and net profits. There will also be suggestions for users to either reduce their ask or whether their valuation is lower than what the product market or any previous similar Shark Tank investments suggests. We plan to incorporate two different forms of machine learning models/techniques in order to implement the above.

## 3.2 Timeline

- [x] ~~Week 1: Set up environment~~
- [ ] Week 2: Submit Project Proposal
- [ ] Week 3: Find dataset and episode transcripts
- [ ] Week 4: Research and decide on best model
- [ ] Week 5: Design model
- [ ] Week 6: Train/debug model for basic classification
- [ ] Week 7: Train/debug model for basic classification
- [ ] Week 8: Submit Progress Report and Demo
- [ ] Week 9: Plan user interface
- [ ] Week 10: Start implementing user interface
- [ ] Week 11: Expand model for more classification
- [ ] Week 12: Train/debug model for all feedback
- [ ] Week 13: Combine model and user interface
- [ ] Week 14: Make poster for intersection
- [ ] Week 15: Practice presentation
- [ ] Week 16: Submit Final Project Code and Report