

Capstone Project Proposal



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Business Goals

Project Overview and Goal What is the industry problem you are trying to solve? Why use ML/AI in solving this task? Be as specific as you can when describing how ML/AI can provide value. For example, if you're labeling images, how will this help the business?	Project name: Arabic Sentiment analysis of tweets Sentiment analysis is the automated process of analyzing text to determine the sentiment expressed (positive, negative or neutral). Some popular sentiment analysis applications include social media monitoring. Social media posts often present some of the most truthful points of view about your products because users offer their opinions unsolicited. Around 6,000 tweets are sent every second, and a large proportion probably mention businesses. You receive a lot of feedback on social media. And, you're looking at hours, maybe even days, to process all that data manually. But, with the help of machine learning, you can wade through all that data in minutes, to analyze individual emotions and overall public sentiment.
Business Case Why is this an important problem to solve? Make a case for building this product in terms of its impact on recurring revenue, market share, customer happiness and/or other drivers of business success.	Analysis store's Twitter data has big impact on recurring revenue and customer happiness. Sentiment analysis of social data will keep an eye on customer opinion 24/7 and in real time. you'll be able to quickly respond and boost your image. And, you'll get regular, dependable insights about your customers, which you can use to monitor your progress.
Application of ML/AI What precise task will you use	Building machine learning model that can determine the tone (positive, negative, neutral) of the tweets. The business outcome or objective that I am trying to achieve is improving customer experience by analyzing customers feedback on the

ML/AI to accomplish? What business outcome or objective will you achieve?

products or services that are offered. Best way to success is knowing your customers' need.

Success Metrics

Success Metrics

What business metrics will you apply to determine the success of your product? Good metrics are clearly defined and easily measurable. Specify how you will establish a baseline value to provide a point of comparison.

The business metrics that I would apply to determine the success of the product is increase in revenue by improving customer experience.

To establish a baseline value and provide a point of comparison, I will collect the stats about the current revenue before the sentiment analysis is applied and compare the result with the stats after the sentiment analysis is applied.

Data

Data Acquisition

Where will you source your data from? What is the cost to acquire these data? Are there any personally identifying information (PII) or data sensitivity issues you will need to overcome? Will data become available on an ongoing basis, or will you acquire a large batch of data that will need to be refreshed?

The data source will be from business's Twitter including the customer's comments and tweets that have been mentioned to business's account. Our IT team will use Twitter API to acquire these data because this data is sensitive data and might include customer's info, so we don't want to share it with third party company.

For annotation tweets, depend on my research there is no annotation platform supports Arabic, if any it won't offer high quality annotation because Arabic sentiment analysis has not been studied at level as high as other languages, e.g., English, Chinese, French. One of the key factors is the lack of high-quality and large-scale training data.

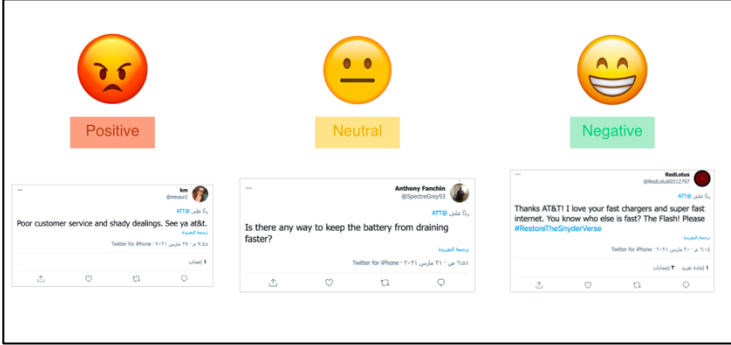
So, we will collect and annotate the data as on-going process and keep refreshing model based on how well it is performing.

Data Source Consider the size and source of your data; what biases are built into the data and how might the data be improved?	Source of data will be personal collection and annotation. Data will be collected from different time and days; we need to make sure that data is balanced. There are many other factors may affect our sentiment analysis like age and gender, but it is hard to know that as many people in social media tend to use nickname other than their real name.
Choice of Data Labels What labels did you decide to add to your data? And why did you decide on these labels versus any other option?	Each tweet will fall into one of three categories positive, negative or neutral. Positive label if the tweet contains positive words such as good, best, beautiful, etc and negative labels if the tweet contains negative words such as bad, worst, ugly, etc. The third label neutral to account for uncertainty. This approach keeps the analysis simpler and more straight forward than any other approaches.

Model

Model Building How will you resource building the model that you need? Will you outsource model training and/or hosting to an external platform, or will you build the model using an in-house team, and why?	I will initially build the model using Automated ML services like Google Auto ML. Then I will go over the metrics and see if the model is achieving the performance that would be good enough for me. If it is then I go ahead with the model, else I will try to see where I can improve the model like adding more data etc. If I am still not satisfied with the performance of the model, then I will try to build the model using in house team.
Evaluating Results Which model performance metrics are appropriate to measure the success of your model? What level of performance is required?	I will measure the success of the model using Precision and F1 Score. Sentiment analysis is not an easy task to perform, one tweet may have multiple sentiment expression. So, according to researchers is good to reach around 80-85% of accuracy in training sentiment system.

Minimum Viable Product (MVP)

<p>Design</p> <p>What does your minimum viable product look like? Include sketches of your product.</p>	<p>This is a sample sentiment analysis model for telecommunication company @ATT</p> 
<p>Use Cases</p> <p>What persona are you designing for? Can you describe the major epic-level use cases your product addresses? How will users access this product?</p>	<p>This system can be used for any business that wants to know more about their customers needs and opinion in fast and effective way to improve their product/service.</p>
<p>Roll-out</p> <p>How will this be adopted? What does the go-to-market plan look like?</p>	<p>Prelaunch – Conduct market research, test the product enough, prepared to fulfill orders, do digital marketing for the product and hype</p> <p>Postlaunch – Monitor your product performance and keep continuously improving, talk to customers and get their requests and roll out new features, fix bugs if there are any.</p>

Post-MVP-Deployment

<p>Designing for Longevity</p> <p>How might you improve your product in the long-term? How might real-world data be different from the training data? How will your product learn from new data? How might you employ A/B testing</p>	<p>As analyzing of sentiments people is complex task, we need to keep collecting more and more data and improving the model to deal with all kinds of sentiments it can encounter.</p> <p>We need to do A/B testing to perform incremental improvement to the model. It will be targeted a subset of users to use the new model (80% of traffic to old model and 20% to new model) to see how the new model is performing.</p>
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to improve your product?	
Monitor Bias How do you plan to monitor or mitigate unwanted bias in your model?	If the model doesn't do well in classify specific sentiment for example it classifies neutral tweets as negative sentiment, then we need to add more data in areas where model is not performing well and retrain it.