NLP BASED SUGGESTION AND RECOMMENDATION SYSTEM

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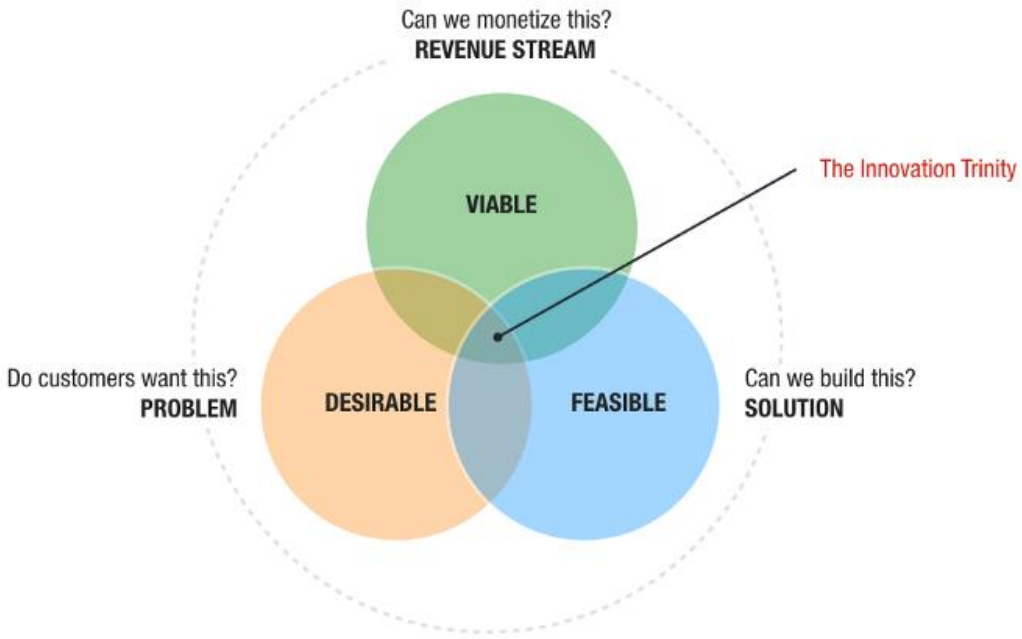
Prototype Selection:

NLP-based suggestion and recommendation prototypes are applications that use natural language processing techniques to provide personalized recommendations to users. These prototypes can be used for a wide range of applications such as e-commerce, content recommendation, and personalized chatbots.



The feasibility, viability, and monetization for an NLP-based suggestion and recommendation prototype can be evaluated as follows:

Feasibility: The technical feasibility of prototype is high, as there are various pre-trained NLP models and libraries that can be used for feature engineering and model training. The operational feasibility will depend on the infrastructure and resources available for hosting the model and serving requests. Economic feasibility will depend on the costs of hosting and maintaining the model, as well as the cost of acquiring or collecting data for training the model.

Viability: The viability of an prototype will depend on the market demand for such a tool. There is a growing demand for personalized recommendations in various industries such as e-commerce, media, and entertainment. The competition will depend on existing solutions in the market, and how well the prototype can differentiate itself from them. To evaluate market demand and competition, it would be necessary to conduct market research.

Monetization: The monetization strategy for an NLP-based suggestion and recommendation prototype can include various models such as charging for API access, charging for a subscription-

based service, or taking a percentage of revenue generated from the recommendations made. The pricing model can depend on factors such as the target audience, the features offered, and the value proposition of the prototype.

Overall, the feasibility and viability of an NLP-based suggestion and recommendation prototype will depend on several factors such as the quality of the data, the performance of the model, the target audience, and the competition in the market. To ensure success, it is crucial to conduct proper research and testing before launching the prototype, and to continuously improve and update the model based on user feedback and changing market conditions.

Prototype Development:

Here's an outline of the steps involved in building an NLP-based suggestion and recommendation prototype:

Data Collection: The first step is to collect data on user behavior, preferences, and other relevant information. This can be done using various methods such as surveys, web analytics, or transactional data.

Data Preprocessing: Once the data is collected, it needs to be preprocessed to prepare it for analysis. This includes tasks such as data cleaning, normalization, and feature extraction.

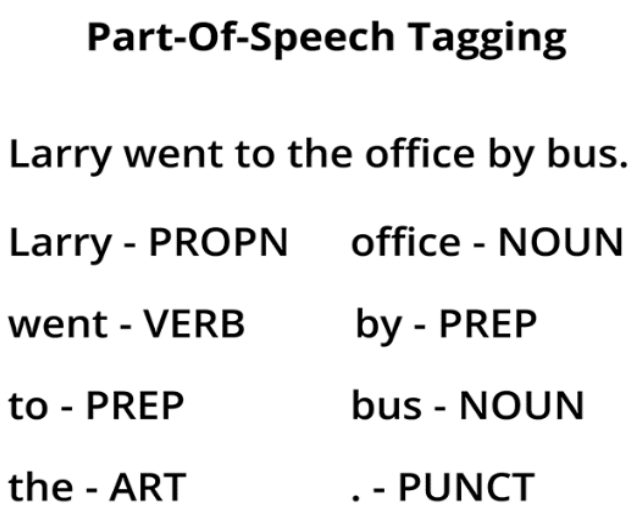
Feature Engineering: Feature engineering involves transforming the raw data into a set of relevant features that can be used to make recommendations. This can include features such as user preferences, past behavior, demographic information, and contextual data.

Model Training: After feature engineering, you can train a machine learning model to make recommendations based on the features. You can use various algorithms such as collaborative filtering, content-based filtering, and hybrid methods.

Evaluation: Once the model is trained, you need to evaluate its performance using metrics such as accuracy, precision, recall, and F1 score.

Deployment: After evaluation, the model can be deployed as a prototype. This can be done as a web application or an API that takes user input in natural language and returns personalized recommendations.

Some key factors to consider when building prototypes include the quality of the data, the performance of the model, and the user experience. To ensure success, it is crucial to conduct proper research, testing, and evaluation before launching the prototype.



Business Modelling:

Value Proposition: Defining the unique value proposition of prototype. This can include factors such as the accuracy and relevance of the recommendations, the user experience, and the ability to handle complex queries.

Target Audience: This can include businesses in specific industries such as e-commerce, media, and entertainment, or individuals who are looking for personalized recommendations in specific domains such as books, movies, or music.

Revenue Streams: This can include charging for API access, charging for a subscription-based service, or taking a percentage of revenue generated from the recommendations made.

Cost Structure: This can include the costs of acquiring or collecting data for training the model, the costs of hosting and maintaining the model, and the costs of marketing and sales.

Subscription-based model: One way to monetize prototype is by offering a subscription-based model. This involves charging users a monthly or yearly fee to access recommendation services. This can work well if offer is unique and valuable recommendations that cannot be found elsewhere.

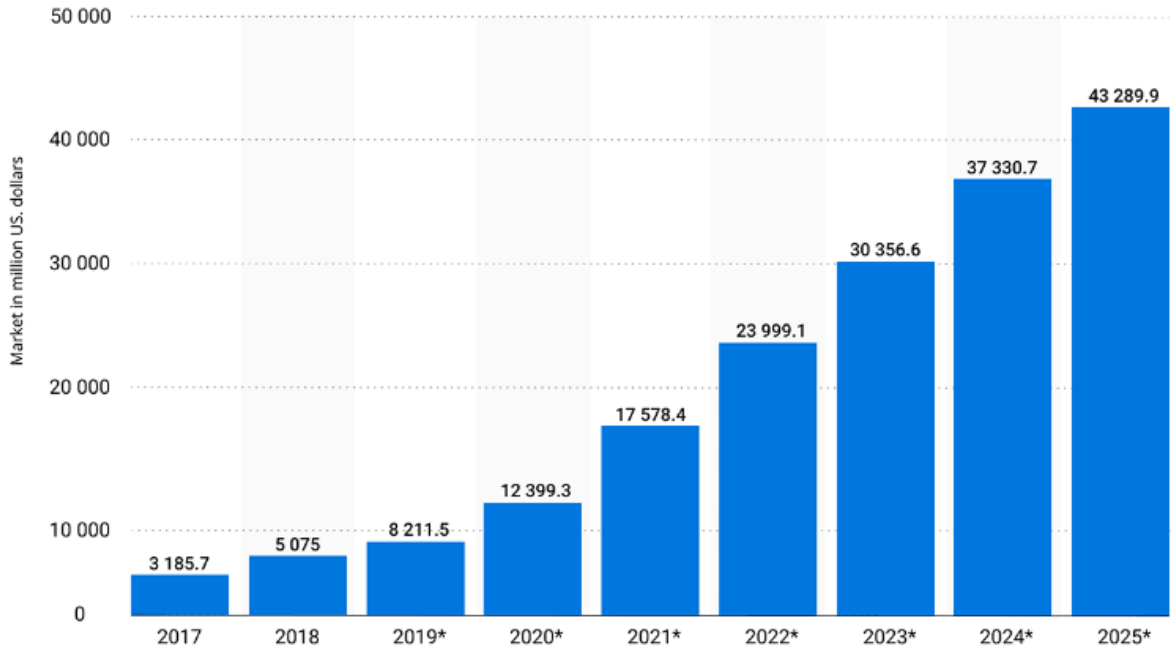
Pay-per-use model: Another option is to charge users on a pay-per-use basis. This involves charging users for each recommendation or query they make. This can be a good option if your recommendations are highly specialized or if users only need to make occasional queries.

Sponsored recommendations: Partnering with businesses and offering sponsored recommendations. This involves recommending products or services from your partner businesses in exchange for a fee or commission.

Affiliate marketing: This involves recommending products or services to users and earning a commission on any resulting sales.

Financial Modelling (equation) with Machine Learning & Data Analysis:

A 2019 Statista report reveals that the NLP market will increase to 43.9 billion dollars by 2025.



According to various market research reports, the global natural language processing (NLP) market size is projected to grow significantly in the coming years. Here are some statistics regarding the NLP market:

The NLP market size was valued at USD 10.2 billion in 2020 and is projected to reach USD 35.1 billion by 2026, at a CAGR of 22.3% from 2021 to 2026.

In 2020, the largest share of the NLP market was held by the healthcare industry, followed by the media and entertainment industry. (Grand View Research)

By technology, the rule-based NLP technology segment held the largest market share in 2020. However, the machine learning technology segment is expected to grow at the highest CAGR during the forecast period. (Mordor Intelligence)

The Asia Pacific region is projected to grow at the highest CAGR during the forecast period, due to the increasing adoption of NLP solutions in emerging economies such as China and India. (Grand View Research)

Some of the key players in the NLP market include IBM Corporation, Google LLC, Amazon Web Services, Inc., Microsoft Corporation, Intel Corporation, and SAS Institute Inc. (Market Research Future)

Implementation:

```python
import random

# Train data
train_text = "I like to eat eggs. I like to eat ham. I like to eat chicken. I like to eat fish."

# Preprocessing
train_text_tokens = train_text.lower().split()
prefix_size = 2  # prefix size for Markov chain
markov_dict = {}
for i in range(len(train_text_tokens) - prefix_size):
    prefix = tuple(train_text_tokens[i:i+prefix_size])
    suffix = train_text_tokens[i+prefix_size]
    if prefix in markov_dict:
        markov_dict[prefix].append(suffix)
    else:
        markov_dict[prefix] = [suffix]

# Predict next word
prefix = ("i", "like")
predicted_word = random.choice(markov_dict[prefix])
print("Next word prediction: ", predicted_word)
```

```
Next word prediction:  to
```

We can see an example of a Markov Model being used from the above. Here, we've taken a train text and are receiving results based on the assumptions.

Conclusion:

In this study, we use NLP and machine learning models to anticipate text and the following word. Results are entirely based on trained models. This can be used for text suggestions, spelling corrections, and other business-related tasks like entering the following letter. Both business purposes and other uses are benefited from it.