# Phi Distributed Recommendations

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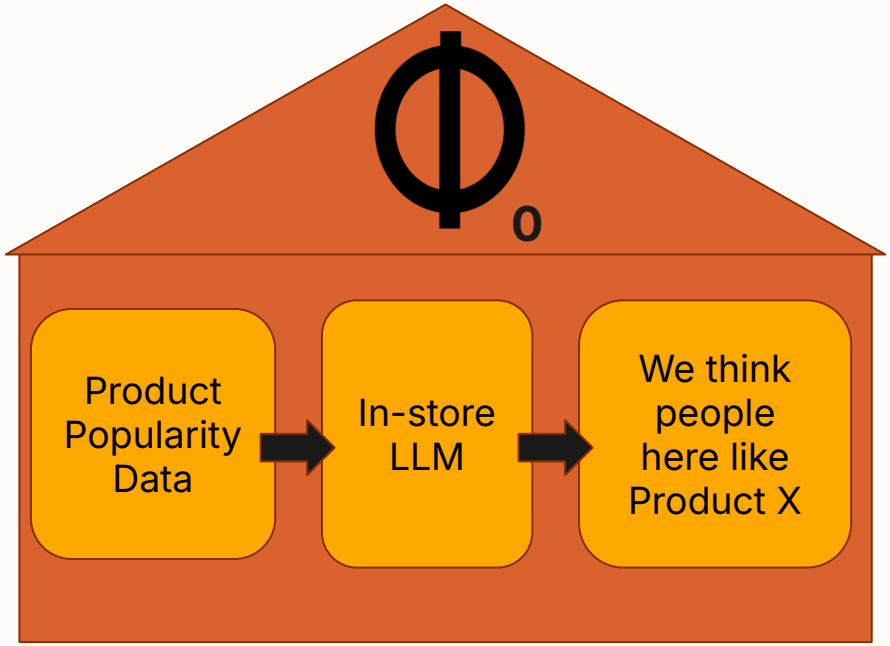
Targeting Ecommerce companies for better value recommendation

# Motivation (The Pain)

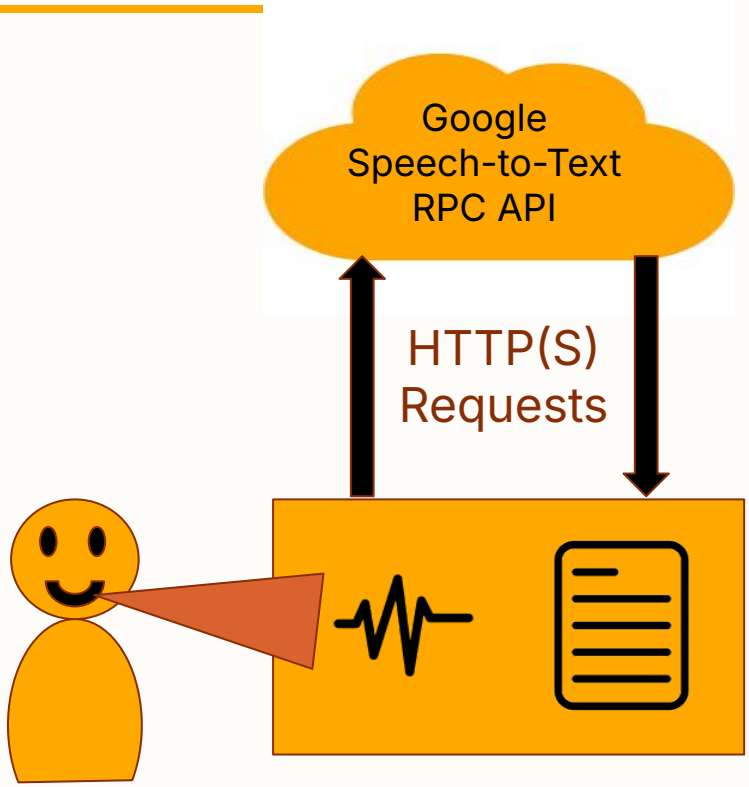
- Phi Store sells in-person products
- Phi wants to expand into E-commerce
- Phi wants users to visit their website and listen to the user's voice expressed in plain English, but they don't know how to make this happen
- No way to target customers




~1.17 trillion spent in ads this year

# Our Solution (The Fix)

- Process user speech via Google RPC
- Take advantage of the distributed nature of existing stores
- Combine existing natural language recommendations into a distributed system of recommendations
- Ensemble based LLM recommendations



# Issues

P1. The AWS instance was assigned to a new IP address each time it started. It caused connection issues between the backend and AWS.

P2. The LLM treated each input as a distinct order and couldn’t handle them as a sequence.

P3.

# Solutions

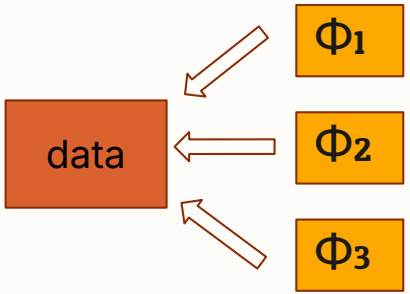
S1.  Set a static IP address on AWS website so that it has the same IP address every time it runs.

S2. Negligible(?) Issue. Each input will be orders by different users and a user can get a new recommendation even if the given order was wrong or invalid.

S3.

# Key Winnings

- Minimalistic oriented design
- Cutting-edge large language models
- Collect vast data from different Phi-stores
- Scalable by design

# Capabilities

Our recommendation system can deal with:

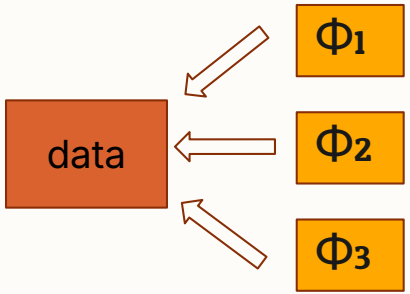
- Checking the invalid or irrelevant input.
- Customized orders based on the user's preference and the big data.
- Accept input based on natural voice commands
- Scales to as many stores as desired

# Justification

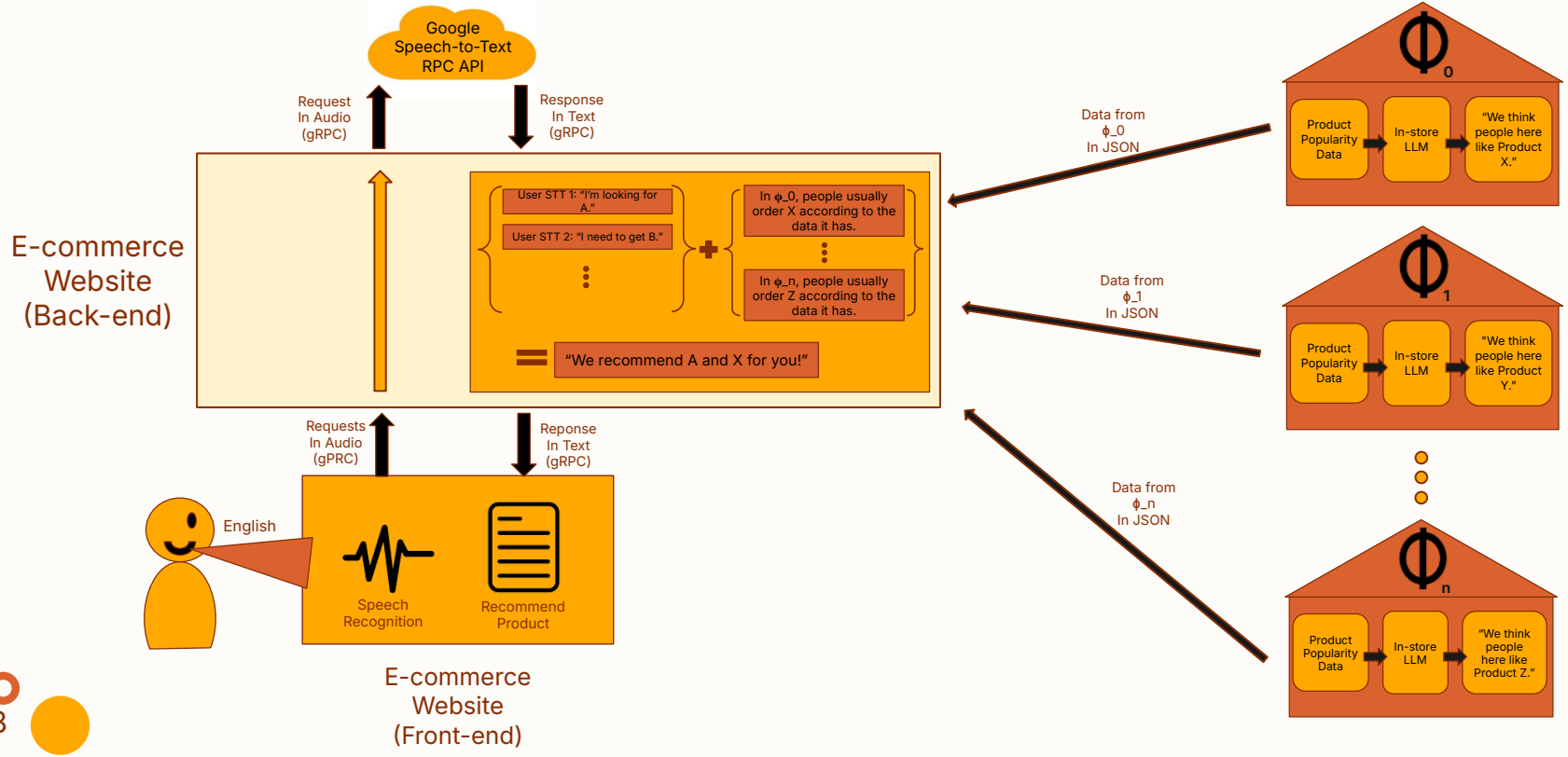
- Invalid or Irrelevant Input
  - Better serve end-users privacy
  - Review their order in speech before confirming the order.
- Control for User's Preference
  - Their orders will be added to a large dataset to provide a customized recommendation.
- Process Natural Voice Commands
  - Accessible interface for users with unique needs
- Infinite Horizontal Scaling
  - The large dataset can be scaled as the number of Phi stores increases.
  - Better serve users geographically

# Status + Prototype

- Process expressions through plain english
  - User’s can listen to their voice before submission
- Control for preferences through **location** and **voice**
  - Combined with different stores popularity data
- Infinite Horizontal scaling
  - Add more stores for higher precision recommendation



# Architecture + Protocols



# Prototype Demo

# Business Model

- Pay-as-you-go pricing model:
  - Prices are request based
  - Complements the distributed nature of the system
  - Scales more effectively than subscription based model, as more e-commerce grows over time

# Business Analysis

- The idea of LLM based recommendation is applicable to other businesses as well.
  - Each Phi-Store can be viewed as an offline store for a business.
  - Using the data from each offline store, the LLM can aggregate these data and generate recommendations based on a user's online order.
- The LLM can handle a large amount of data with the scalable distributed system.
  - Each Phi-Store is treated as an object that can be copied in the AWS based distributed system.

# Libraries/Tech Stack

- Frontend
  - Typescript
  - React + Vanilla CSS
- Backend
  - Typescript
  - Node + ExpressJS + gRPC
- Phi-Store
  - Java + Bash
  - Native HTTP Libraries

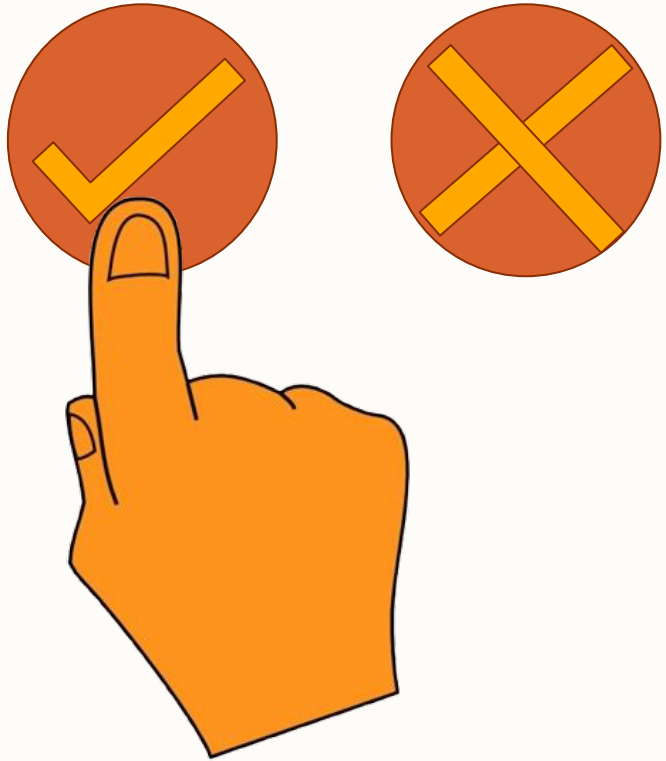


# Team Contribution

- Front-End
  - Website Design (Jinho)
  - Google STT (Jinho)
  - IP to Geo-Location (Jinho)
- Back-End
  - Deploying LLM (Reese)
  - Data Aggregation from Front-End and AWS (Reese)
  - Generating LLM based recommendation from the aggregated data and Google STT (Reese & Jinho)
- AWS
  - Building a server for distributable Phi-Stores (Reese)
  - Creating mock data for Phi-Stores (Reese)

# What we are asking

- Implementation Plan
  - Based on prototype
  - Add more stores
  - Refine the UI
- More Robust Validation
  - LLM fine-tuning
  - STT input validation
- Market Entry
  - Break into existing markets for recommender systems
  - Distributed Nature will give us a unique edge



# Phi Store Φ

## Thank you !