Fresh Express

Amazon HackOn submission for team CodingAlphas

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Introduction & Background

After the immense success of [Flex](#) & [IHS](#) programmes in India we are happy to announce the launch of a fresh new idea which can supposedly change the lives of millions of people in India - **FreshExpress.** This is our unique take on the much touted **Hyperlocal** delivery model which can save Amazon a lot of money in terms of revenue and shipping costs. Last mile delivery, also known as last mile logistics, is the transportation of goods from a distribution hub to the final delivery destination — the door of the customer. The goal of last mile delivery logistics is to deliver the packages as affordably, quickly and accurately as possible.The last mile of your product's delivery accounts for more than **53%** of the total shipping costs. Given that the vast majority of deliveries are small packages, these numbers reflect small parcels rather than large cargo.

The hyperlocal marketplace as the name suggests is a market that caters to the needs of a limited geographical area. A walk around your residence would most definitely make you come across a similar market, however big or small but self-sufficient in its own right, fulfilling almost all the requirements of the local residents. The USP of hyperlocal e-commerce businesses lies in their ability to deliver products and services at unbelievably fast speed. With the implementation of our model any business can accelerate their growth by using the following features.

1.   Auto-detection of customer's location
2.   Shipment scheduling
3.   Product filtering based on location
4.   Automatic shop suggestion based on unique recommendation engine

The objective of this model is to locate a source providing the best overall value to the customer at the least possible time.By fixing the price of the products in hyperlocal "stores" defined in a given geographic region Amazon can benefit from the program by reducing the "last-mile" delivery costs to a fraction of the previous amount while at the same time gaining new customers by providing a fast,efficient and streamlined delivery system.

Business Model & Proposals

The following Business model & Requirements apply to this Proposal:

There are two components of a business model — qualitative and quantitative. Let us begin by looking into its *qualitative* aspects :

Value Proposition : The fundamental proposition of the company to the various stakeholders is simple and may be described as follows :

1. **User** -- The service offers convenience of saving time by delivering the items in the shortest possible amount of time.It also offers a plethora of options to choose from the hyperlocal market.
2. **Store** -- Increased sales due to higher discoverability & visibility amongst the densely populated residential areas along with better mapping and management of inventory. Amazon also provides credit and advisory services to help these "Amazon" stores. Local "Amazon" stores affiliated with "Amazon" at every nook and corner of the locality.
3. **Runner** -- Works as pleases for some extra monthly income. Is always tied up with a local store. "Amazon Flex" service & "Amazon prime" 1-day guaranteed delivery as backup in case of unique product items not available in any of the hyperlocal stores.
4. **Investors** -- FreshExpress becomes a 'SuperApp' solely owned by "Amazon" and controls most of the online market harnessing the power of data & technology to further improve/expand the business. The last mile delivery problem for the investor is solved along with some extra income in the range of (**5-10%**) per transaction which can be charged from the Stores for using their provided services and app.

Market Opportunity : The market size in India for online grocery is currently just 0.2% of the overall grocery market and is expected to touch 1.2% of the overall by 2023. There are several possible reasons for this. One is the definition of the market. Hyperlocal today encompasses more markets than it did earlier in 2015. Second is the expansion of the market. Newer ideas such as medicine delivery, homecare services and particularly micro delivery(Milk and other essentials) have seen exponential growth in terms of the number of users. Users of these services can prove to be stickier than those of food delivery and ride-hailing.

Market Dynamics : The demand side for the applications composed of its paying customers. They would like to order grocery/cosmetics/electronics items and goods. The supply side however comprises a 3-sided marketplace consisting of Kirana/Mall/Shop who is the provider of the service & goods whereas the delivery personnel owned by the Kirana/Mall/Shop connects the provider to the customer. On expansion of this model to use cases other than food/grocery anybody can become a provider/runner. Continuous promotion of this model and primary network effect would lead to more local stores to be available in any locality providing "Amazon" with more revenue per se.

A few **quantitative** aspects of this model are as follows :

Revenue Streams : Income for hyperlocal delivery companies usually comes from merchant commissions and delivery fees from customers. Further, depending on the type of product offerings, such as in the case of subscriptions in the microdelivery segment, revenue streams may vary. Commissions fall in the sub 10% range for grocery delivery companies and can be between 10% and 15% for electronics goods providing companies. Amazon can also make money from brand advertisements displayed on their apps.

Cost Structures : The cost structure generally tends to be variable. These are usually the consequences that stem from the choices the management makes. Paying per delivery may help on-boarding runners but is not sustainable in the long run and can severely impact the unit economics. Rather, paying for timed slots would change the cost structure to fixed and can improve profitability as the business scales.This needs to be discussed with store owners as they will be the sole decision makers for the delivery part of the service.Surprise quality inspections has to be made on local stores to check the quality of products being sold in stores. With our unique **rating & recommendation** system a point based approach will be awarded to the shops so that the quality of the product and the services are maintained beforehand.Training costs for "runner" has to be borne by Amazon.

Societal & Economic impacts : <u>**Jeff Bezos says Amazon will invest $1 billion in digitising Small and Medium Businesses (SMBs) in India**</u>. With the advent of this model, the Micro Small & Medium Enterprises (MSMEs) & Small & Medium Business(SMBs) will benefit a lot. Every small business can be a part of a big brand as "Amazon" and every runner will be provided with a part-time and full-time income. Local entrepreneurs not only know their neighborhoods very well, but also enjoy the goodwill of their communities. This makes them an excellent choice as local delivery persons & store keepers especially within small localities. This will attract store owners to earn an extra income over and above their primary income. Moreover this will help small towns and cities where Amazon warehouses are still not available and the cost of delivering items is still huge. This model will save huge costs for the company and will provide a medium for the small/medium storekeepers to earn an extra source of income above and beyond their usual means. The "runners" will also be provided with training and education along with customary rewards for their service to this programme.

Project Description

The purpose of this project is as follows:

1. Conversion from Unorganized retailing to organized retailing
2. Connecting all the local stores via digital plattform
3. Reducing the latent distance between the sellers and buyers .
4. Facilitating easier and hassle-free replacement and alteration of products

The components of the project is as follows:

1.   Customer-Facing Application
2.   Store-Keeper Facing Application
3.   Recommendation Engine
4.   Geo-Partitioned distributed database

Customer-Facing Application

For our prototype we have implemented a fresh simple engaging application based on the likes of Amazon which offers customers an unique take on 3 categories of items - Grocery, Cosmetics, Electronics. From signing up in our portal to ordering an item in the cart to generating the invoice of the ordered items all the basic functionalities of a user have been taken care of. In case of any issues faced with the application or the shopping process a support chat has been provided by one of our developers to track and solve the pending issues as soon as possible.

StoreKeeper-Facing Application

This module has been implemented as a branch of the customer-facing application to maintain the uniformity in the User-Interface design. Each and every one of the StoreKeepers have been provided with an option to track their inventory and opt in/out from delivering an order item. This will be immensely helpful for StoreKeepers to track status of items and stack up accordingly. The Status Bar for the storekeepers is expected

to see the maximum activity whereby each storekeeper can accept/reject an order forwarded to them by the Recommendation Engine.

Recommendation Engine

This module is responsible for the efficient interaction between the Customer and Shopkeeper along with providing an accurate score based on the following criteria:

1. Distance of the Customer from the Shops defined within a range
2. Dynamic Rating calculation for individual shops
3. Successful orders completed by individual shops
4. Total number of items available for delivery by individual shops

By calculating an effective **score** for the following criteria a shop has to maintain the highest quality and standards as is expected from any "Amazon" store. The scores will be an indicator in future to filter out shops and force the shopkeepers to maintain quality and quantity so that it is not flagged by the recommendation engine. For now the scores are being displayed as an indicator for the Customer to choose the most appropriate store accordingly.

Geo-Partitioned Distributed Database

Geo-Partitioning allows for database partitioning by location, tying your data to a location for performance or compliance. By working with these types of Databases (CockroachDB) an entire region can be broken down into small chunks of latitudes and longitudes to serve a region efficiently. This is very useful in our case where we can break down an entire country/city into manageable regions and maintain the stores and customers for the geolocation accordingly. This allows us to keep customer data close to the user, which reduces the distance it needs to travel, thereby reducing latency and improving user experience.

Project Scope

In India, Unorganized retailers are the biggest concern which are not able to connect through digital platforms. Connecting the Local stores via digital platform will help to reduce the Carbon footprint, Create local jobs, Improving the local economy and better Customer service.

Shopping locally promotes individuality and breathes new life into communities that are dominated by generic and commodified companies. Local economic growth will attract new talent and professionals, who may, in turn, create businesses of their own, enhancing a local economy and boosting the revenue of the Company.

Our project aims to connect with local stores of particular geographical regions and give customers a better experience of shopping by providing them fast delivery of the purchased products and more personalized service.

The Customers have to register themselves on the FreshExpress ,based on the location where the customer is residing ,It searches the required shops within their range and displays it. The customer then selects the products listed on the webpage which product is available in that particular area. On clicking the checkout button the orders will be sent to the required shops and shops confirm the orders by clicking on the accept /reject button..

Inventory management

The inventory has real-time sync with a different location. So that the customer would be able to see the right stock of the product based on their location. It helps to map the product in the nearby locality so that the customer is aware of it before placing the order.

Shopper availability and delivery

The delivery is the most critical part of the eCommerce marketplace. The shopkeeper can manage the delivery slot availability by clicking on the accept /reject button ,open/close button indicating whether the shopkeeper can deliver the order or not.

Checkout from various stores/vendor

The customers have the advantage to select the shops from which shop customers want to place the order based on the reviews and personalized experience.This feature helps the customers to get the scalability with the store.

Realtime Chat

Many times the customers face issues during order delivery or placing of orders e.t.c in this case. In this case, having a chat system with the customer can really solve the problem.

The criteria set forth below should be met to achieve successful completion of the project:

1. Customer can order products without any problem
2. Stores can register and list their inventory online
3. Delivery of products should be within expected time delivery
4. Nearest shop is selected resulting in low waiting period time
5. In case of unavailability of items,orders should be fulfilled via flexible delivery

Project Timelines

The Project timeline is as follows:

Request for Proposal Issuance	17/05/2021
DataBase Design Finalized	18/05/2021
Cockroach Database Connection Established	19/05/2021
Recommendation Engine Established	22/05/2021
Functionalities added for 1st stable prototype	24/05/2021
Minor Bug Fixes & Functionalities Improvement	28/05/2021
Client Project Delivery	30/05/2021
Client Project Demo	11/06/2021

The need-date for project completion is 30th May 2021. Judges may propose a date earlier or later, and work has to be ramped up accordingly.

Example Scenario

The example scenario consists of an ideal location[1] defined by our geohash function in the map here. The user geolocation is fixed at this point in the map. For our scenario[2] we are running a live simulation by registering a set of 12 shops defined in the 5km range.
The shop definition along with their respective credentials are as follows:

SHOPNAME	USERID	PASSWORD	ADDRESS IN MAP
Banjara Merchant	banjaramerchant	bphc1234	Banjara Merchant
Ratnadeep Super Market Pvt. Ltd	ratnadeep1	bphc1234	Ratnadeep Super Market Pvt. Ltd
World Food Store	worldfoodstore	bphc1234	World Food Store
SRINIVASA DAILY NEEDS	srinivasa	bphc1234	SRINIVASA DAILY NEEDS
Ratnadeep Super Market	ratnadeep2	bphc1234	Ratnadeep Super Market
More Hypermart, Banjara Hills	morehypermart	bphc1234	More Hypermart, Banjara Hills
Heritage Fresh	heritagefresh	bphc1234	Heritage Fresh
Reliance Fresh	reliancefresh	bphc1234	Reliance Fresh
Jubilee Store	jubileestore	bphc1234	Jubilee Store
Sri Sai Kirana & General Store	srisaikirana	bphc1234	Sri Sai Kirana & eneral Store
Spencers - City Center Mall	spencers	bphc1234	Spencers - City Center Mall

[1] 5km range with 12 valid shops.
[2] Geo-Partitioning a database is not possible due to unavailability of Enterprise License.

When a customer logins into FreshExpress shopping portal and tries to buy some items from a plethora of options we fetch the customer's geolocation as input and run it through our unique "Recommendation Engine" to filter out the valid shops within a given 2Km range. It is one of the many criterias which we are using to define a valid score for a shop so that the customer is always given the option to choose from the best. Once the customer places their order the shopkeepers are notified of the order items and they can accept/reject that order in their respective portals accordingly. Once the order is finalized by any of the shopkeepers it's time for the customers to choose their favorite stores accordingly. Once the store is finalized it is the time for the runners to do their part and deliver the order in the shortest possible time. In case of item unavailability the order will be forwarded to the nearest Amazon warehouse for successful delivery via Amazon Flex. Once the item has been delivered by the runner and the transaction amount is collected a feedback loop for the order rating is run and the recommendation engine gets ready for the next available store for order item delivery.

This procedure is run multiple times without fail guaranteeing uninterrupted services to the customer by the shopkeepers and solving the "Last-Mile" problem for Amazon.
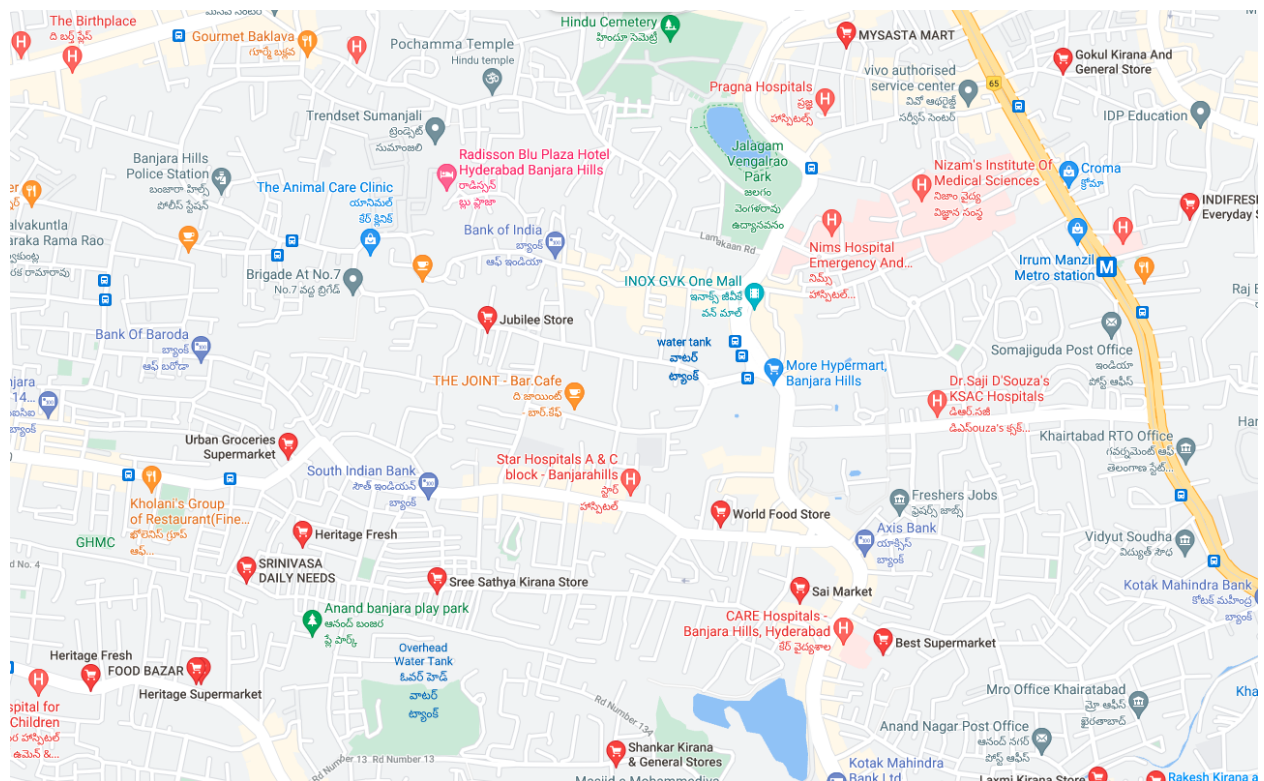

Example Scenario Sample Map

Evaluation Factors

Logistics, as the backbone of the e-commerce industry needs to be optimal in order for the industry to thrive and grow. In India people tend to buy many items from local grocery stores and stores. Meeting the needs of a customer by providing products and services within an hour is a challenging task.
Local retailers and stores collaborating with online platforms to employ hyperlocal strategy would help their business. A hyperlocal strategy would bring considerable improvements to the aspect of rapid delivery.

Hyperlocal strategy can be a key differentiator and driver for businesses. It has the potential to bring more local clients to local stores and dramatically reduce inventory and logistics expenses of online shopping platforms.It also has a considerable appeal to consumers given the possibility of unforeseen reduction in delivery times.Many of the options were developed in the past such as last mile delivery,crowd shipping but none were completely helpful. Connecting local stores with the online platform and expanding their business would increase their business sales and also helps to connect every store globally improving the brand image overall.
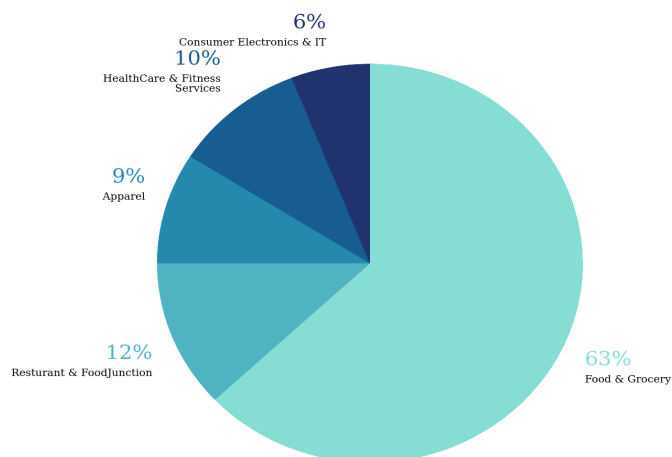
Hyperlocal delivery service can be a blessing in disguise for the informal sector of the society which accounts for 92% of the total workforce and 50% of the total GDP of the country.

Different types of retailing in India

9%
Organized retailing

1%
E-tail

90%
Unorganized retailing
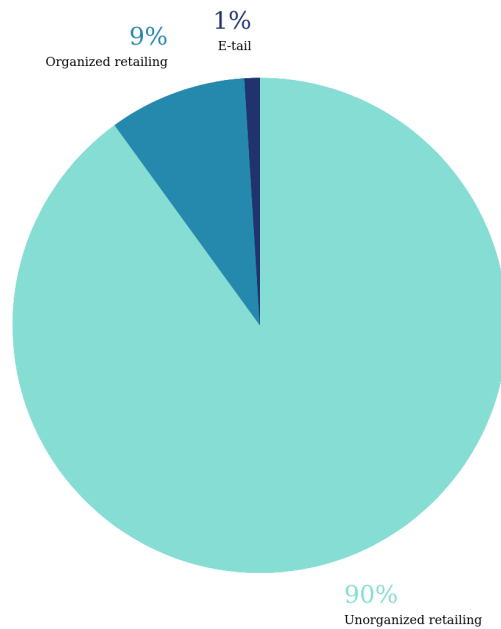
According to the [Report](#) published in March 2020 on behalf of the Observer Research Foundation the proportion of informal workers in the total participating labour-force reaches around 90+%.

Break-up of segments of organized Retail

6%
Consumer Electronics & IT

10%
HealthCare & Fitness Services

9%
Apparel

12%
Resturant & FoodJunction

63%
Food & Grocery

Active Issues

1. "Get your location" button in the homepage is not working . The button takes user location through HTML Geolocation API and prints in the console. For our test scenario we have defined an ideal region in the [map](#) with 12 nearby shops. **Possible Resolutions :** Once the prototype is successfully implemented and business data is collected this model can be extended and implemented to every location in any region in India. The user location will then be stored into a database for further processing by the recommendation engine.

2. "CockroachDB Enterprise Issue" : [Geo-partitioning requires an Enterprise license.](#) Unavailability of Enterprise License for Geo-Partitioning won't allow us to test this feature of GeoPartitioning a massive database according to the specified regions as defined previously in our project. **Possible Resolutions :** Work on sample data defined within a given range, looking out for alternative databases accordingly which allow users to geo-partition data for free.

Future Plans

1. Drone Based Delivery Subsystem using Amazon Air.
2. Use of the existing transportation systems to facilitate faster deliveries.
3. Amazon Pay payment integration for faster checkouts and payment processing.
4. Amazon Flex integration with the existing application.